

## RESEARCH ARTICLE



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# Open strategy and dynamic capabilities: A framework for circular economy business models research

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## Abstract

The circular economy has attracted the interest of business leaders, policy makers and academics alike for its potential to contribute to a more resilient, prosperous and resource-efficient economy. The transition towards a circular economy requires new business models that challenge the linear logic of value creation that is still endemic across most industries. In turn, the transition from linear to circular business models involves the rethinking of strategic decision-making processes and the development of new organisational capabilities. This paper addresses these important strategic implications of the emergence and implementation of circular business models. Coupling business models with open strategy and dynamic capabilities, we develop a “three-pronged” strategy framework that advances the emerging field of circular business model research. Our contribution is crystallised into a series of propositions and future research questions for scholars working at the intersection of the circular economy and the strategy literature.

## KEYWORDS

business models, circular economy, circular economy business models, dynamic capabilities, open strategy

## 1 | INTRODUCTION

The circular economy (CE)—*an economy that is restorative and regenerative*—has attracted the interest of business leaders, policy makers and academics alike as a promising and viable vision for an economy that can build prosperity within planetary boundaries. New business models (BMs) and the transformation of existing ones are amongst the key building blocks of the transition towards the CE (EMF, 2015; Hopkinson et al., 2020). This implies a rethinking of strategic decision-making processes since strategy and BMs are closely related (Foss & Saebi, 2017) and the development of organisational capabilities

supporting the transition from linear to circular business models (CBMs) (Panwar & Niesten, 2022).

Research that integrates corporate sustainability thinking in the strategic management literature is scant, with only a few exceptions (e.g., Borland et al., 2016; Stead & Stead, 2017; Wunder, 2019). How to integrate sustainability principles in corporate decision-making is mostly the focus of the field-based sustainability scholars and journals (Engert et al., 2016). Likewise, with few exceptions (e.g., Tonelli & Cristoni, 2019), CE thinking, mirroring sustainable BMs research (Snihur & Bocken, 2022), is weakly represented in the strategic management literature, and little has emerged from managerial and strategic perspectives in the CE and CBMs literature (Pietrulla & Frankenberger, 2022; Sehnem et al., 2021). Puglieri et al. (2022) lament the lack of integration between strategy, strategic planning and the CE literature. Bocken and Ritala (2020) counsel that there is a

**Abbreviations:** BMs, Business models; CBMs, Circular business models; CE, Circular economy; DCs, Dynamic capabilities; OS, Open strategy.

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“need for clear strategic guidelines on how existing and new companies can launch circular business model initiatives” (p. 1). Hence, the overarching research question in this article is as follows: *How can the emergence and implementation of CBMs be understood from a strategy perspective?*

Open strategy (OS) (Chesbrough & Appleyard, 2007), which is now receiving considerable attention in the strategy literature (Birkinshaw, 2017), and dynamic capabilities (DCs) (Teece et al., 1997), an appropriate theoretical framework for ecological sustainability research and practice (Borland et al., 2016), define the scope of our theoretical framing. The BM and the DCs perspectives have mostly developed in separate literature silos (Amit & Zott, 2016). Yet, Teece (2018) has emphasised the relationship between BMs, strategy and capabilities in very clear terms highlighting that these are all interdependent. Furthermore, whilst ordinary capabilities and DCs are enablers supporting organisations in the transition towards a CE (Pais Seles et al., 2022; Reim et al., 2021) and have been used in CE literature to some extent (e.g., Elf et al., 2022; Khan et al., 2020, 2022; Marrucci et al., 2022; Pieroni et al., 2019a), an overarching theoretical framework linking DCs with BMs in the context of CE research is still absent from literature.

Additionally, to the best of our knowledge, the concept of OS has not been used in CE research, despite the need for enhanced cooperation and inclusiveness among a range of stakeholders in the strategic decision-making process due the systemic and cooperative features of CBMs and circular ecosystems (Kanda et al., 2021; Parida et al., 2019), which stand in sharp contrast with the “elitist,” “secretive,” top-down, directive and traditional model of strategy-making (Birkinshaw, 2017). To address the above opportunities, we develop a “three-pronged” strategy framework to explain the emergence and implementation of CBMs and suggest a set of research propositions for scholars working at the intersection between the CE and strategy literature.

Figure 1 illustrates our conceptual framework.

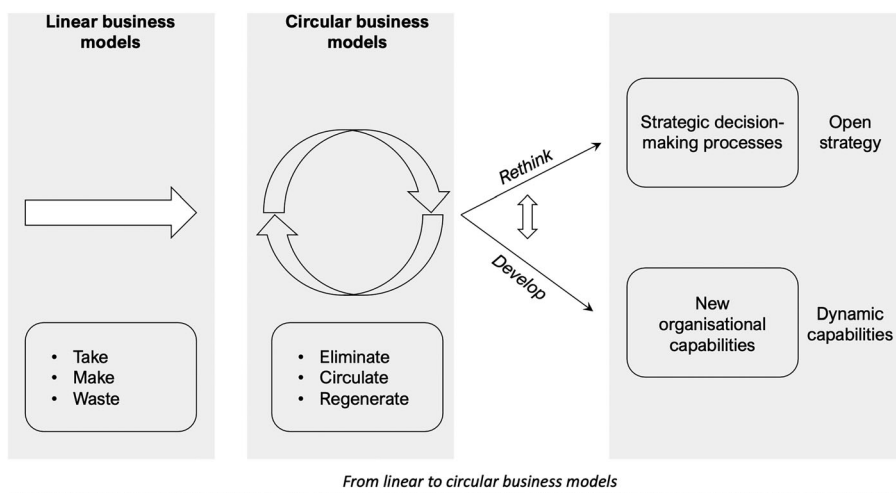
The remainder of this article is organised as it follows. Section 2 illustrates the research method. Section 3 offers a synthesis of CE and

CBMs research and it explains the rationale behind the development of this study. Section 4 illustrates this article's three-pronged strategy framework and a set of research propositions. Section 5 discusses the research implications and proposes future research directions. Finally, Section 6 summarises our contributions.

## 2 | RESEARCH METHOD

As proposed by Hulland (2020), “there is no easy way to generate previously unconsidered connections and other non-obvious insights” (p. 30). Nonetheless, to build our theoretical argument, we undertook several steps engaging with studying, (re)-reading, discussing, synthesising, formalising, hypothesising and gathering feedback (Cornelissen et al., 2021; Hulland & Houston, 2020). Our form of theorising can be considered as *explanatory theorising* (Cornelissen et al., 2021). This involves using “existing theories (...) to conceptualize and order topics, and (...) specific forms of reasoning (such as propositional reasoning) to progressively zoom in on the underlying causal forces or mechanisms that explain the manifestation, dynamics, and outcomes of the topic” (Cornelissen et al., 2021, p. 6). The aim of this conceptual paper is to generate an integrative theoretical framework that links the strategy and the CE fields to offer a plausible explanation of the emergence and implementation of CBMs. Particularly, in line with Hulland (2020), we develop our conceptual paper by defining the scope and the domain of our research endeavour, integrating and synthesising the related knowledge, solving inconsistencies, underlining gaps in existing literature and proposing directions for future research. We took a narrative approach to the literature review, which, rather than using a systematic protocol, relies on the researcher's judgement in identifying relevant literature (Cronin & George, 2020). This approach is suitable for theory building (Sovacool et al., 2018), pertinent within the context of business research (Snyder, 2019) and in line with previous studies in the context of sustainable BMs research (e.g., Ritala et al., 2021).

Table 1 illustrates and clarifies the steps of the research process.



**FIGURE 1** A three-pronged strategy framework for circular business models research. Source: The authors.

**TABLE 1** Steps in conceptual development.

Key steps	Features of this study
Defining domain and scope.	Domain: How can the strategic management literature advance understanding of the emergence and implementation of CBMs? Scope: DCs and OS.
Integrating and synthesising existing knowledge.	BM, CBMs, DCs and OS.
Identifying and solving inconsistencies.	Inconsistency <sub>1</sub> : BMs and DCs have been mostly taken separate in the strategic management literature. They are reconciled in our conceptual paper. Inconsistency <sub>2</sub> : OS is not currently used in CE research. It is included in our conceptual paper.
Highlighting gaps and generating insights.	Little has emerged from managerial and strategic perspectives in the CE and CBMs literature.
Proposing a research agenda.	Defining a set of future research questions.

Source: The authors and based on Hulland (2020).

### 3 | CIRCULAR ECONOMY AND CIRCULAR BUSINESS MODELS

Put simply, current business approaches are not fit to deal with the severity of the ecological crisis: “sustainable business is reaching the limits of what it can accomplish in its present form. It is slowing the velocity at which we are approaching a crisis, but we are not changing course” (Hoffman, 2018, p. 35). Traditional sustainability efforts have emphasised efficiency, that is, doing more with less, to reduce negative environmental impact. Yet, as noted by Sroufe (2018), efficiency is “a good place to start, but a tragic place to stop” (p. 313) since resources will eventually become exhausted. Conversely, the CE—an economy that is “restorative and regenerative by intention and design” (EMF & McKinsey, 2012, p. 7)—seeks to radically transform our linear operating production and consumption systems building prosperity for all, people and planet. Defined as “a cognitive framework instrumental to the emergence of a credible, shared and persuasive imaginary of more environmentally, economically and socially sustainable production and consumption systems, by positively engaging, focusing, evoking and planning how to achieve an integral human betterment” (De Angelis & Ianulardo, 2020, p. 147), the CE is emerging as a plausible and shared solution to our complex social grand challenges (Jaeger-Erben et al., 2021). In fact, Stahel (2019) suggests that the CE is “not the only smart and green strategy there is, but probably the most sustainable business model improving simultaneously ecologic, social and economic factors” (p. 91).

Since the early conceptualisation and publications by the *Ellen MacArthur Foundation* in conjunction with *McKinsey & Company* in 2012, the CE has made significant progress in catalysing the interest of a range of stakeholders across the academia, policy and business

contexts (Bigliardi & Filippelli, 2021). Studies contributing to the CE literature have, in large part, come from scholars in the engineering and environment fields (Khitous et al., 2020; Sarja et al., 2021), and since the CE is also framed as a major source of economic and business opportunities (Lacy & Rutqvist, 2015), it is surprising that business and management studies have been limited to date. Bocken et al. (2021) lament that “knowledge and methods on how to transition to a circular economy from a business perspective are only emerging” (p. 2). Additionally, it is the micro level that has received less attention than the macro and meso levels in CE research (Barreiro-Gen & Lozano, 2020; Fernandez de Arroyabe et al., 2021), which is once again striking considering the central role businesses play in achieving a CE transition (Hopkinson et al., 2020; Webster, 2013). In fact, as pointed out by Kirchherr et al. (2017), “a CE understanding lacking business models is one with no driver at the steering wheel” (p. 228). As crucial players in the transition towards a more resource-efficient CE, companies need to undergo a fundamental change in the logic of value creation inherent to linear operating BMs (Hopkinson et al., 2020). Agreement on a definition of CBMs does not exist yet (Rowanto & Bask, 2021). Typically, definitions combine the key dimensions of the BM concept (viz., value creation, delivery and capture), with CE principles. In current CE and CBMs literature, little synthesis has emerged from managerial and strategic perspectives (Ferasso et al., 2020; Pietrulla & Frankenberger, 2022; Sehnem et al., 2021) despite the cognate relationship between strategy and BMs as two closely related concepts (Foss & Saebi, 2017).

The emerging literature with a “strategy” orientation to CBMs takes two different approaches. The first can be qualified as *loosely coupled* with the strategy literature. Studies in this category, although making use of terms like “strategy” and “strategic,” do not draw on concepts/themes/frameworks from the strategy literature. For one, Bocken and Ritala (2020) combine innovation strategies (closed and open) with CE-related resources strategies (*narrowing, closing and slowing* resource loops), and as a result, they propose six “strategy” archetypes for CBMs: *open-narrowing, open-slowning, open-closing, closed-narrowing, closed-slowning and closed-closing* (p. 3). Along a similar line, Hultberg and Pal (2021) suggest four “strategic options” for scaling CBMs in the fashion industry: *efficiency-centred closed BMs strategies, adaptability-centred closed BMs strategies, efficiency-centred open BMs strategies and adaptability-centred open BMs strategies* (p. 12). These strategies are referred to, respectively, as *do it yourself, absorb external ideas and opportunities, divide the labour and create together* approaches (pp.12–15).

The second approach, instead, is more *tightly coupled* with the strategy literature since, within this category, scholars explicitly draw upon concepts/frameworks/tools in the strategy field and, particularly, on DCs (Eisenhardt & Martin, 2000; Teece et al., 1997). In a CE and innovation literature review from the perspective of organisational capabilities, Sehnem et al. (2021) find that DCs and relational capabilities have attracted the most attention, and they argue that both positively influence CE implementation. In this space, studies have investigated capabilities development frameworks (e.g., Kusumowardani et al., 2022; Reim et al., 2021), the development

process of DCs (e.g., Kabongo & Boiral, 2017), DCs for CE implementation in SMEs (e.g., Prieto-Sandoval et al., 2019), constructs to measure CE DCs (e.g., Scarpellini et al., 2020) and the micro-foundations of DCs in CBMs implementation (e.g., Khan et al., 2020; Sandberg & Hultberg, 2021; Santa-Maria et al., 2022).

Although this second approach contributes to infuse the CE literature with key themes from the strategy field, Bocken and Ritala's (2020) call for "clear strategic guidelines on how existing and new companies can launch circular business model initiatives" (p. 1) remains unaddressed. Notably, the relationship between the strategic decision-making process and the emergence and implementation of CBMs is still unclear. This is both unfortunate and surprising since strategy and BMs are two closely related concepts (Foss & Saebi, 2017). This is explained by Teece (2018) who claims: strategy

"maps out in broad terms how the company will compete. Strategic analysis leads to the selection of a particular business model, market segments, and a go-to-market approach over others. It often leads to abandoning an old business model for a new one in order to create and maintain a distinct advantage in the marketplace" (p. 44).

Therefore, it is time to cast some light on this relationship within the context of the emergence and implementation of CBMs.

## 4 | A THREE-PRONGED STRATEGY FRAMEWORK FOR CIRCULAR BUSINESS MODELS RESEARCH

### 4.1 | Business models and strategy: Similar but not the same?

The BM literature has witnessed a significant growth in the last 15 years. Yet, the strategy and the BM literature have mostly developed independently (Lanzolla & Markides, 2021). In what ways the BM is related to the concept of strategy has sparked a lot of interest, and whether it contributes to enrich the strategy field is still a contested issue.

Hacklin and Wallnöfer (2012) describe the difference between the concepts of the BM and strategy as ambiguous. Bigelow and Barney (2021) argue that the BM concept is significantly similar to strategy. They warn that proposing the BM as a new concept may be redundant since most of the features of a BM are discussed in existing strategy theories. By contrast, Teece (2010) contends that a BM is not the same as strategy: as a construct, the BM is more generic than a business strategy and strategic analysis is crucial to design a BM that leads to a sustained competitive advantage. Casadeu-Masanell and Ricart (2010) concur with Teece by viewing BMs and strategies as two different—though connected—constructs. Accordingly, BMs refer to the logic of value creation of the firm, whereas strategy implies the choice of the BM through which a firm competes in the market. Put

simply: "a business model is the direct result of strategy but is not, itself, strategy" (p. 212).

Expousing the views suggesting that the concepts of strategy and BM are related but not the same, in this article, we seek to unravel the relationship between strategy and the emergence and implementation of CBMs by drawing on the concept of OS (Chesbrough & Appleyard, 2007).

### 4.2 | Why open strategy?

Although still in its early development, OS is receiving considerable attention in the strategy literature and practice (Birkinshaw, 2017; Hautz et al., 2017). The appropriateness of the OS concept within the context of this research can be understood by exploring the characteristics of the process of CBMs implementation.

According to Zott and Amit (2010), the BM can be viewed as "a system of interdependent activities that transcends the focal firm and spans its boundaries" (p. 216). This activity system allows the firm to create and capture value in collaboration with its network of customers, suppliers and partners. Analogously, although the boundaries of CBMs are mostly viewed as if matching the firm's boundaries (Rowanto & Bask, 2021), CBMs can also be viewed from the lenses of the activity system perspective. As Parida et al. (2019) declare, when companies go through circular-driven BM innovation, they are compelled to collaborate with customers and a range of actors including service partners and third-party suppliers. In parallel, Pieroni et al. (2019b) highlight that CBMs implementation requires companies to cooperate with the wider ecosystem of actors. This is further emphasised by Brown et al. (2021) and Köhler et al. (2022) who argue that the transition towards circular production systems is based on collaboration with other companies, suppliers and customers.

Cooperation within and across ecosystems partners results in a shift from a CBM perspective to a "circular ecosystem view," implying a dynamic interaction among different stakeholders in the process of CE implementation (Kanda et al., 2021). A circular ecosystem is defined as a "system of interdependent and heterogeneous actors that go beyond industrial boundaries and direct the collective efforts towards a circular value proposition, providing opportunities for economic and environmental sustainability" (Trevisan et al., 2022, p. 292). This circular ecosystem perspective mirrors the early conceptualisation of the CE wherein four building blocks are identified as enabling the transition towards a CE, that is, (i) circular design, (ii) new business models, (iii) reverse logistics and (iv) systemic conditions (EMF & McKinsey, 2012), which, according to Hopkinson et al. (2020), are a useful heuristic to illustrate the systemic nature of the process of value creation and capture in a CE context. For example, an ecosystem of more than 50 organisations makes up the *De Clique* network in Utrecht in The Netherlands (EMF, 2022a). *De Clique* collects organic waste streams (food by-products), that is, coffee grounds and orange peels, from waste producers and resell them to product manufacturers, which use these waste streams to make new products, that is, orange beer from orange peel and Oyster mushroom from spent

ground coffee (ibid.). Other examples include the cross-industry collaboration between *Levi's* and *Renewcell*, creating the WellThread 502 jeans made with organic cotton and Circulose®, an innovative material obtained from worn-out jeans (Circle Economy, 2022a). Further, *Carlsberg's* Green Fiber Bottle project is the first prototype of a paper beer bottle that is 100% bio-based and fully recyclable developed drawing from the concept of open innovation and in collaboration with partners in the company's ecosystem (Bogers et al., 2020).

These systemic and cooperative features of CBMs and circular ecosystems stand in sharp contrast with the “elitist,” “secretive” and led-by-the top traditional model of strategy-making (Birkinshaw, 2017). Hence, we argue there is a need for a new, more inclusive approach in the strategic decision-making process for CBMs to emerge in the first place and for their subsequent implementation and scaling. Therefore, we now turn towards illustrating the concept of OS.

### 4.3 | Open strategy

The term “open strategy” was first coined by Chesbrough and Appleyard (2007) as a novel approach to strategy-making. OS challenges the prevailing approach to business strategy, which prioritises the establishment of competitive barriers over open and collaborative networks. OS has received increased attention from both academics and practitioners recently (Birkinshaw, 2017; Hautz et al., 2017). According to Whittington et al. (2011), openness has two dimensions: inclusiveness (who is involved) and transparency (how much information is shared). Hence, OS is characterised by enhanced inclusiveness and transparency, both internally and externally (ibid.). Hautz et al. (2017) view OS as “a dynamic bundle of practices that affords internal and external actors greater strategic transparency and/or inclusion, the balance and extent of which respond to evolving contingencies derived from both within and without organizational boundaries” (p. 299).

Birkinshaw (2017) highlights four aspects about OS: *commons-based peer production*, *crowd-based input to decision-making*, *collective buy-in and action* and *collective sense-making* (pp. 423–425). The first aspect—*commons-based peer production*—concerns people collaborating on a voluntary basis to create knowledge or information such as in the case of Wikipedia (Benkler & Nissenbaum, 2006). The second aspect—*crowd-based input to decision-making*—refers to involving many internal and external stakeholders to provide inputs (e.g., generating new ideas or evaluating existing ideas) in the strategic decision-making process whilst retaining consistency and firmness and developing the capabilities to incorporate such inputs in the decision-making process (Birkinshaw, 2017). The third aspect—*collective buy-in and action*—is about getting people to change their behaviour to implement the chosen strategy (ibid.). The fourth aspect—*collective sense-making* of a firm's strategy in the capital markets—involves the use of intermediaries (e.g., analysts) to make sense of information provided by executives (ibid.). As put by Birkinshaw (2017), “to the extent that executives are pursuing a more Open

Strategy agenda, we would expect them to provide greater transparency to the capital markets as well as to other stakeholders” (p. 425).

Moving from the current, linear operating fashion industry, one of the most polluting and wasteful industries (EMF, 2022b), to a circular fashion industry requires traceability and transparency along supply chains to identify and measure ecological and social impacts, assist in the decision-making process, define new BMs and provide clear information to consumers (Circle Economy, 2022b). The *TextileGenesis* platform, in partnership with *FashionForGood*, *Bestseller* and *Kering*, was used in a pilot for viscose traceability with the result that brands were able to catalogue and track about 23,000 units of products and thereby enhancing transparency and traceability across the supply chain (ibid.). Brown et al. (2021) argue that collaborative circular innovation brings a set of challenges including the alignment of partners around a shared circular purpose and the development of governance and decision-making processes that are attuned to the circular context. A collaborative stance is necessary to decide, for example, how to share risks and manage uncertainty and ambiguities (ibid.). The example and the features of collaborative circular innovation just illustrated highlight that the key features of OS, that is, enhanced inclusiveness and transparency, as well as the aspect of *crowd-based input to decision-making*, are pertinent from the perspective of the emergence and implementation of CBMs. Hence, our first proposition is as follows:

**P1.** An open approach to strategic decision-making (i.e., crowd-based input to decision making and enhanced inclusiveness and transparency) facilitates the emergence and implementation of CBMs.

We now turn to explore the capabilities construct of our three-pronged strategy framework. As pointed by Kanda et al. (2021), a circular ecosystem requires organisations to develop a new set of capabilities such as those related, for example, to the management of the different ecosystem components. New capabilities are also needed to handle the OS process itself. We explore this further in the next section.

### 4.4 | Capabilities

It was Teece (2018) who placed the relationship between BMs, strategy and capabilities in very clear terms highlighting that strategy, BMs and DCs are interdependent. Starting from the relationship between BMs and capabilities, he argues that “the design and operation of business models are dependent on a firm's capabilities. The crafting, refinement, implementation, and transformation of business models are outputs of high-order (dynamic) capabilities” (p. 40). Strategy

“maps out in broad terms how the company will compete. Strategic analysis leads to the selection of a particular business model, market segments, and a go-to-market approach over others. It often leads to

abandoning an old business model for a new one in order to create and maintain a distinct advantage in the marketplace” (p. 44).

In his seminal paper, Teece et al. (1997) refer to DCs as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environment” (p. 516). Subsequently, Teece (2007) further explicated DCs as “the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise’s intangible and tangible assets” (Teece, 2007, p. 1319), also referred to as *sensing*, *seizing* and *reconfiguring* capabilities. *Sensing* involves identifying opportunities across current and potential markets and technologies; *seizing* involves investments in products, processes and services development and the choice of the BM; and *reconfiguring* involves recombining and reconfiguring assets and structures to better exploit new opportunities (Teece, 2007). By contrast, ordinary capabilities are those supporting the production and sale of products and services, and they include, for instance, efficient manufacturing and effective marketing (Schoemaker et al., 2018).

Most of the DCs literature has developed from the narrow perspective of economic value creation exclusively. Yet, some DCs insights have been reported in the corporate sustainability literature (Tiberius et al., 2021). For example, Eikelenboom and de Jong (2019) argue that integrative DCs help SMEs to continuously integrate stakeholders’ concerns and develop systemic solutions for sustainability leading to higher economic, environmental and social sustainability performances. Inigo and Albareda (2019) find that DCs relating to sustainability-oriented innovation include openness, stakeholders’ integration, adaptation to regulatory and technological environments, systems thinking and the development of trustful relations. They also discuss three different levels of DCs (*adapting*, *expanding* and *transforming*) related to strategic sustainability dimensions (*sustainability-driven market reconfiguration*, *sustainable business management* and *sustainability networking and leadership*) (p. 345). Borland et al. (2016) propose an expanded (ecocentric) DCs framework that includes the DCs of *remapping* and *reaping* (p. 293). *Remapping* involves considering current products and processes as resources for new cycles of production and *reaping* involves the ability to derive financial and non-financial gains from circular flows of products and materials (ibid.).

The DCs of *sensing*, *seizing* and *reconfiguring*, which according to Teece (2018) are crucial in the context of BM innovation, are also essential in terms of sustainable strategic management and sustainable BM innovation (Bocken & Geradts, 2020). According to Schaltegger et al. (2016), a sustainable BM

“helps describing, analyzing, managing and communicating (i) a company’s sustainable value proposition to its customers and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures

economic value while maintaining or regenerating natural, social and economic capital beyond its organizational boundaries” (p. 4).

In relation to sustainable BM innovation, *sensing* would involve recognising the changing business–natural environment interface and identify this as a potential source of opportunities (Bocken & Geradts, 2020). *Seizing* would entail to create and capture value from these emerging opportunities, and finally, *reconfiguring* would require the implementation of new and more sustainable BMs (ibid.). Inigo et al. (2017) distinguish between evolutionary/incremental and radical/major BM innovation for sustainability, and they investigate the DCs of *sensing*, *seizing* and *reconfiguring* related to developing such innovations. Bocken and Geradts (2020) explored the organisational design factor stemming from institutional, strategic and operational levels that hinder or enable the development of dynamic capabilities for BM innovation for sustainability. For one, they argue that the pursuit of value creation for shareholders only and short-termism at the institutional level encourage a focus on exploitation at the strategic level and translate into an incentive system that hinders DCs for sustainable BM innovation at the operational level. On the other hand, they argue that the pursuit of stakeholders’ value at the institutional level could favour a strategic focus on sustainable BM innovation and thereby the shift to sustainability metrics that enable DCs for sustainable BM innovation at the operational level.

Developing and incorporating capabilities in digital technologies is at the heart of *The Sorting for Circularity Project* launched in May 2021 with the aim to accelerate textile recycling through technological innovation (Circle Economy, 2022c). The project utilises Near Infrared technology to analyse textile waste analysis across Europe and to map the capabilities of textile recyclers; an open digital platform will match textile waste from sorters to recyclers, promoting alignment between stakeholders and the development of CE-oriented infrastructure (ibid.). *Gerrard Street* manufactures and sells headphones with an innovative design and business model. Headphones are designed in a modular way with no glue, which means that they can be easily disassembled for repair and upgrade (EMF, 2022c). Furthermore, headphones are offered on a subscription rather than purchase model: Over the payment of a monthly fee, customers are also entitled to repair and upgrade (ibid.). *HP* and *Sintronics* have partnered to launch the first CE initiative in the Brazilian electronics sector (EMF, 2022d). Particularly, *Sintronics*’s expertise in reverse logistics enables a closed-loop plastics recycling from HP end-of-use products; through R&D development, the process has led to the development of high-quality recycled white plastic to be used in *HP* electronics products (ibid.).

In addition to these examples illustrating the development of capabilities to pursue circular innovation, capabilities are also discussed in CE literature (Sehnm et al., 2021). This is not surprising considering that Pais Seles et al. (2022) find that capabilities and DCs are amongst the enablers supporting organisations to transition towards a CE. Similarly, Panwar and Niesten (2022) argue that scaling the CE requires first and foremost the development of “sensing,

seizing and reconfiguring capabilities to reduce, reuse and recycle, and enabling firms to proactively engage with suppliers, customers and other external stakeholders” (p. 2). Yet, Reim et al. (2021) lament that little is known about the capabilities needed to build or transform a BM to a CBM and propose a capability development framework identifying the capabilities needed when progressing towards more advanced typologies of CBMs. They group capabilities into three categories: *solution configuration*, *orchestration* and *digitalisation capabilities* (p. 2753). Sandberg and Hultberg (2021) highlight that research at the intersection between DCs and CBMs is in its early days, and they identify the micro-foundations of the DCs of *sensing*, *seizing* and *reconfiguring* needed for scaling CBMs along the dimensions of *scaling out*, *scaling up* and *scaling deep* (p. 1). Khan et al. (2020) and Santa-Maria et al. (2022) offer empirical evidence about the micro-foundations of DCs for CBMs implementation. Particularly, Khan et al. (2020) find that DCs facilitate the implementation of CBMs. Companies can apply four micro-foundations of *sensing* (*market monitoring and technology scanning*, *idea generation*, *knowledge creation* and *experiential learning*), three micro-foundations of *seizing* (*strategic planning*, *business model and governance* and *collaboration*) and four micro-foundations of *reconfiguring* (*organisational restructuring*, *technological upgradation*, *knowledge integration* and *best practices adaptation*) to identify, seize and respond to circular business opportunities (p. 13). Marrucci et al. (2022) find that DCs contribute to the internalisation of environmental management systems, which leads to an improvement of organisational performances and to the adoption of CE.

Yet, the literature discussing capabilities and DCs within the context of CE research suffers from a limited acknowledgement of CE thinking and principles. To begin with, it seems to neglect that the engagement with any form of circular innovation requires first and foremost the development of what can be termed as a “first-order” strategic orientation, pertaining to how organisations view themselves in relation to the wider socio-ecological system within which they operate. For strategic orientation, we refer here to “principles that direct and influence the activities of a firm and generate the behaviors intended to ensure its viability and performance” (Hakala, 2011, p. 199). The CE seeks to reintegrate economy within ecology or recouple economy with ecology (EMF et al., 2015). From this follows that any organisation wishing to apply its principles has to embrace a systems thinking approach, to the way of viewing and doing business.

“This approach provides a way of understanding, analyzing, and communicating the design and construction of an enterprise as an integrated, complex composition of many interconnected systems (social, environmental, governance, and economic) that need to work together for the whole to function successfully” (Sroufe, 2018, p. 31).

One of the implications of systems thinking, which has relevance from the perspective of this research, is that the emergence and

implementation of CBMs requires, from the outset, the development of a “circular strategic orientation,” that is, *recoupling* organisational functioning with ecology, a prerequisite to create and capture value in a CE.

Second, studies of DCs in CE, whilst offering specific and valuable insights as to how these capabilities are developed and about their micro-foundations, do not capture CE principles, that is, *eliminate*, *circulate* and *regenerate* (EMF, 2015), and thereby, they hardly ever reflect CE thinking in the way DCs are conceptualised. We believe this is an omission worth addressing to reduce abstraction and promote greater cross-fertilisation between the CE and strategy literature. Hence, our second proposition is as follows:

**P2.** The dynamic capabilities of sensing, seizing and reconfiguring in designing out waste (eliminate), keeping products and materials in use for as long as possible (circulate) and regenerating natural systems (regenerate) facilitate the emergence and implementation of CBMs once an organisation is geared towards recoupling.

The emergence, implementation and transformation of BMs are the output of DCs (Teece, 2018), and BM innovation itself is a DC (Amit & Zott, 2016; Schoemaker et al., 2018). As put by Amit and Zott (2016), the design, implementation and management of the BM can be linked to the dimensions of DCs and so to *sensing*, *seizing* and *transforming*, respectively. Yet, within the context of CE research, there is only one study, Khan et al. (2020), that hints at BM innovation for circularity as DC to the best of these authors' knowledge. However, even in Khan's study, the focus is on the micro-foundations of DCs more than on circular BM innovation as a DC itself. Furthermore, the relationship between CE, CBMs and competitiveness, although clearly evidenced in practitioners studies (e.g., EMF et al., 2015; Lacy & Rutqvist, 2015), remains peripheral in conceptual and empirical CE academic research (De Angelis, 2021a; Ferasso et al., 2020). Hence, our third and final proposition is as follows:

**P3.** Business model innovation for circularity is a dynamic capability and is enabled by recoupling. Sensing changes in the business/socio-ecological interface, seizing circular opportunities and reconfiguring organisational structures and processes to adapt to a circular business context are crucial capabilities to attain and sustain competitive advantage in the age of the Anthropocene.

Table 2 summarises findings and limitations of the selected articles in the OS literature and DCs in CBMs literature. It also synthesises the contributions of our study compared with those studies.

Next, we propose some future research directions for scholars working at the intersection between CE and strategy, particularly from the perspectives of OS and DCs.

**TABLE 2** Selected academic articles in the open strategy literature and dynamic capabilities in circular business models literature.

Theme	Key studies	Paper type	Key findings	Limitations	Contribution of our study
Open strategy	Birkinshaw (2017) and Hautz et al. (2017)	Conceptual	Presentation of a framework covering four aspects of OS and of the dilemmas (process, commitment, disclosure, empowerment and escalation) associated with OS.	The research context does not contemplate strategic management for sustainability.	<ul style="list-style-type: none"> <li>We propose an overarching theoretical framework, which includes OS, for research at the intersection between CE and strategy.</li> <li>We discuss the potential implications of OS dilemmas in relation to the emergence and implementation of CBMs.</li> </ul>
Dynamic capabilities	Elf et al. (2022), Kabongo and Boiral (2017), Khan et al. (2020, 2022), Marrucci et al. (2022), Pais Seles et al. (2022), Prieto-Sandoval et al. (2019), Sandberg and Hultberg (2021), Santa-Maria et al. (2022), and Scarpellini et al. (2020)	Mostly empirical	The development process of DCs; DCs for CE implementation in SMEs; constructs to measure CE DCs; micro-foundations of DCs in CBMs implementation; CE DCs with focus on tourism and fashion industries; and investigation of the contribution of DCs to organisational performances and CE implementation.	<ul style="list-style-type: none"> <li>The DCs framework does not account for the peculiarities of the CE context.</li> <li>CE principles and thinking are not incorporated in the way DCs are conceptualised.</li> <li>CBM innovation is not sufficiently discussed as a DC itself.</li> </ul>	<ul style="list-style-type: none"> <li>We develop and “integrated” DCs framework for CE research.</li> <li>We bring CE principles in the way DCs are conceptualised.</li> <li>We propose BM innovation for circularity as a DC.</li> </ul>

Source: The authors.

## 5 | STRATEGY AND CIRCULAR BUSINESS MODELS RESEARCH: AVENUES FOR FUTURE RESEARCH

As an emerging stream of strategy research, OS lends itself to further studies particularly around: the tensions between value creation and capture (the value creation process benefits from multiple inputs, yet success is measured in terms of the ability of an organisation to capture parts of that value); the potential negative consequences of OS (e.g., OS is time-consuming and may generate employees' expectations that are hard to meet); and the role of firms' boundaries (where the boundaries are drawn in the OS process, that is, internal or external stakeholders? And how the outcomes of OS vary in accordance with who is included, that is, internal or external stakeholders?) (Birkinshaw, 2017).

Building on Birkinshaw's (2017) framework of the challenges in OS, Hautz et al. (2017) highlight five different dilemmas. The first is the *dilemma of process*: on one hand, several inputs can be brought to and hence improve the strategic decision-making in OS, yet this also may hinder the strategic decision-making process itself by reducing its speed, flexibility and control. The second is the *dilemma of commitment*: openness increases people's motivation, whilst the complexities associated with greater inclusiveness can undermine commitment

itself, generating frustration among participants. The third is the *dilemma of disclosure*: transparency enhances an organisation's legitimacy in the eyes of its multiple stakeholders and enables collaboration, yet it can also weaken an organisation's competitiveness because, for instance, competitors may become aware of strategically relevant and sensitive information. The fourth is the *dilemma of empowerment* as participants experience both the positives (participation to the strategic decision-making process) and the negatives (extra effort in the strategy process and some forms of accountability for the outcomes of the process) of their involvement. Finally, the *dilemma of escalation* refers to the fact that once the strategic decision-making process is opened in some areas, pressure starts to build in other areas as well. This may work well if an organisation has the possibility to experiment with the areas to open before opening them at a scale. Yet, problems may arise if the process of openness cannot be reverted.

Among these tensions and dilemmas arising from the process of OS, the tensions between value creation and capture as well as the dilemmas of process and disclosure are of relevance in the context of the emergence and implementation of CBMs. Collaborative innovation is crucial in a CE (Brown et al., 2019). Yet, as the literature on open innovation highlights, paradoxes may arise when firms participate in knowledge sharing whilst protecting idiosyncratic resources



**TABLE 3** Research propositions and future research questions in relation to CE principles and conceptual framework.

CE principles	Research framework	Research propositions	Key questions for future research
Eliminate, circulate, and regenerate.	Open strategy.	<b>P<sub>1</sub></b> : An open approach to strategic decision-making (i.e., crowd-based input to decision-making and enhanced inclusiveness and transparency) facilitates the emergence and implementation of CBMs.	<ol style="list-style-type: none"> <li>(1) Under what circumstances does open strategy mitigate potential performing paradoxes resulting from the implementation of CBMs?</li> <li>(2) Under what conditions are transparency and competitiveness synergistic versus conflicting goals in the implementation of CBMs?</li> <li>(3) Under what conditions is the OS process effective and efficient (as opposed to dysfunctional) for CBMs implementation?</li> </ol>
	Dynamic capabilities.	<p><b>P<sub>2</sub></b>: The dynamic capabilities of <i>sensing</i>, <i>seizing</i> and <i>reconfiguring</i> in designing out waste (<i>eliminate</i>), keeping products and materials in use for as long as possible (<i>circulate</i>) and regenerating natural systems (<i>regenerate</i>) facilitate the emergence and implementation of CBMs once an organisation is geared towards recoupling.</p> <p><b>P<sub>3</sub></b>: Business model innovation for circularity is a dynamic capability and is enabled by recoupling. <i>Sensing</i> changes in the business/socio-ecological interface, <i>seizing</i> circular opportunities and <i>reconfiguring</i> organisational structures and processes to adapt to a circular business context are crucial capabilities to attain and sustain competitive advantage in the age of the Anthropocene.</p>	

Source: The authors and based on EMF (2015) for CE principles.

and the rents they generate (Bogers, 2011). De Angelis (2021b) argues that enhanced cooperation in a circular ecosystem may require more vertically integrated organisations wherein the higher degree of control could result in a reduction of flexibility. Furthermore, she notes that a performing paradox is also very likely since value capture at the network level may clash with value capture at the company's level (Jonker et al., 2018). Future research may explore: under what circumstances does OS mitigate potential performing paradoxes resulting from the implementation of CBMs? Under what conditions are transparency and competitiveness synergistic versus conflicting goals in the implementation of CBMs? To follow from this question, under what conditions is the OS process effective and efficient (as opposed to dysfunctional) for CBMs implementation?

Turning to DCs, future studies may investigate: in what ways do capabilities vary in technical and biological cycles and in relation to CE principles? How do capabilities differ in the emergence, implementation and scaling of CBMs? Do different organisational structures and governance influence the development of capabilities for CBMs innovation? Under which individual and contextual circumstances do “circular” capabilities emerge and develop? What is the role of strategic orientation (recoupling) in the development of dynamic capabilities? When and how does BM innovation for circularity lead to the attainment of a sustained competitive advantage?

Table 3 summarises our research propositions and key questions for a research agenda at the intersection between the CE and strategy.

## 6 | CONCLUSION

The CE is the subject of continuously growing academic research. Yet, micro level studies are still limited (Barreiro-Gen & Lozano, 2020; Fernandez de Arroyabe et al., 2021), and this is unfortunate since as correctly noted by Kirchherr et al. (2017), “a CE understanding lacking business models is one with no driver at the steering wheel” (p. 228). Furthermore, managerial and strategic perspectives are somewhat limited in the CE and CBMs literature (Ferasso et al., 2020; Pietrulla & Frankenberger, 2022; Puglieri et al., 2022; Sehnem et al., 2021). Notably, the relationship between the strategic decision-making process, organisational capabilities and the emergence and implementation of CBMs is still unclear. In response to Ahmad et al.'s (2023) call for more research about strategy, learning and innovation in the CE field and Bocken and Ritala's (2020) call for “clear strategic guidelines on how existing and new companies can launch circular business model initiatives” (p. 1), we have developed a “three-pronged” strategy framework to explain the emergence and implementation of

CBMs and proposed some research questions for scholars working at the intersection between strategy and the CE. We built our framework drawing on the work of Teece (2018) who highlighted that strategy, BMs and DCs are interdependent and on the concept of OS (Birkinshaw, 2017).

We are aware that capabilities and DCs have been used in CE literature albeit limitedly (Elf et al., 2022). Nonetheless, our contribution to the CE literature from a strategy perspective is novel for multiple reasons. First, we place the BM and the DCs in relation to each other, whereas these two perspectives have been kept mostly separate in the strategic management literature (Amit & Zott, 2016). Second, we propose an overarching theoretical framework linking DCs with BMs and OS, which is missing in CE research. The concept of OS, to the best of these authors' knowledge, has not been used in CE research yet, and it is still in its infancy in the strategy literature (Hautz et al., 2017). Third, we develop a CE-related DCs framework since (a) we argue that *recoupling* is a fundamental, strategic organisational orientation for circular capabilities and CBMs to emerge; (b) we bring CE principles in the way DCs are conceptualised; and (c) we emphasise BM innovation for circularity as a DC. Our renewed DCs framework can be considered as a "first level" DCs framework in a hierarchy of DCs frameworks in the context of CE research, towards which studies looking at the process through which these capabilities develop and their micro-foundations can contribute as "second level" studies.

Overall, we argue that (i) an OS approach is necessary for the emergence and implementation of CBMs; (ii) the DCs of *sensing, seizing and reconfiguring* in designing out waste, keeping products and materials in use for as long as possible and regenerating natural systems facilitate the emergence and implementation of CBMs; and (iii) BM innovation for circularity is itself a DC. Our framework, and the above contributions, can guide managers and policy makers in identifying the structural and cultural levers that can be used to enhance CBMs implementation at the organisational level. In parallel, our work provides researchers with new avenues to develop empirical work around the antecedents and consequences of CBM implementation.

This study has also some limitations. For one, to contribute to advancing CE research, we took a micro level perspective focussing on the relationship between the strategic decision-making process, organisational capabilities and the emergence and implementation of CBMs. Overall, whilst we opened a research avenue for scholars working at the intersection between the strategy and CE literature by proposing our three-pronged strategy framework, we are aware that the implications for CE research and practice resulting from added complexity, inevitably, cannot not be captured by a manuscript only. Yet, we are confident that our contribution, which builds bridges between the strategy and the CE fields, can stimulate other scholars in the business strategy and environment field to push the boundaries of research at the intersection of BMs, OS, DCs and CE.

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