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Linking Circular Business Models With Value Sources: A Cluster-Based Literature Review

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ABSTRACT

Circular Business Models (CBMs) are critical to advancing the Circular Economy (CE), receiving significant attention from policymakers and corporations alike. Despite this, the conceptual clarity of CBMs remains underdeveloped. This paper presents a systematic literature review of CBM, focusing on definitions, drivers, barriers, and value creation. We identify three primary clusters: CBM concept, CBM transformation, and CBM strategies. Key gaps in the literature are highlighted, with particular regard to market value creation, comprehensive business model framework, and firm maturity. To address these gaps, we propose a framework linking CBM strategies with value sources, offering a more cohesive understanding of circularity within business models. This framework aims to guide future research and practical implementation across various firm maturity stages.

1 | Introduction

The notion of circular economy (CE) and circular business model (CBM) has an important role in the agendas of policymakers around the world, resulting, for example, in the European CE package (European Commission 2015; Fitch-Roy et al. 2021) and has recently attracted considerable attention from the private sector, as documented by a range of initiatives by major companies, such as Google, Renault, and Unilever (Bocken et al. 2017). For practitioners, business model (BM) innovation is seen as a key leverage to implement the CE at the organizational level, as it allows for a systemic shift in the core logic of businesses and the alignment of incentives of different stakeholder groups.

As industries and policymakers worldwide embrace CBMs, distinct regional approaches are emerging, each reflecting the unique economic and environmental urgencies. The 2015 Circular Economy Action Plan aimed to transform the European Union economy by prioritizing waste reduction, resource efficiency, and material reuse, fostering industrial innovation (Mhatre et al. 2021). In India, initiatives like the EU-India Partnership for Circular Economy & Resource Efficiency are fostering international collaboration, while the National Circular Economy Roadmap for Reducing Plastic Waste focuses on tackling one of the country's most pressing environmental challenges (Delegation of the European Union to India and Bhutan 2020; Dhodapkar et al. 2023). Similarly, China's CE policy-driven initiatives are comprehensive national strategies that guide industries in adopting circular practices at scale (Zhu et al. 2019). In South America and South-East Asia, CE strategies are increasingly tied to energy transitions and to drive CE transformations across industries. For instance, this is documented in Chile's waste-to-energy solutions and the retail industry's shift toward circularity (González et al. 2018; Jarpa et al. 2021). Southeast Asia is also taking a comparative and strategic approach, with countries

aligning policies to push CE initiatives across industries (Herrador and Van 2024). Meanwhile, Africa is focusing on systemic change, with the African Circular Economy Alliance charting a pathway to integrate circularity into economic development (ACEA 2024). These diverse regional pathways illustrate that while the transition to circularity is a global movement, its implementation is shaped by local contexts, highlighting the need for nuanced approaches to CBMs.

The concept has also become an important field of academic research with a considerable increase in articles and journals that cover this topic in the last decade (Geissdoerfer et al. 2017). Despite comprehensive coverage of CE practices in the literature (Awan et al. 2021; Bjørnbet et al. 2021; Ahmad et al. 2023), there are notable gaps in the extant literature. One significant gap in the literature reviews on CBMs is the lack of focus on the value creation through CBM. In fact, despite the growing research on CBMs, there is little focus on how these models create value for businesses and stakeholders. Studies largely examine drivers and barriers (Geissdoerfer et al. 2023; Mhatre et al. 2021), but tend to overlook a systematic study of the mechanisms of value creation, delivery, and capture (Asgari and Asgari 2021; Palmié et al. 2021). In fact, existing research primarily focuses on how incumbents adapt CBMs without fundamentally reshaping their business models, often prioritizing value capture over creation and delivery (Rovanto and Bask 2021). However, this limited perspective fails to address how CBMs can systematically generate long-term competitive advantages and stakeholder engagement. Without a comprehensive and overarching review of the value component in CBMs, extant research remains fragmented, limiting the ability to capture the full spectrum of how these models generate, deliver, and capture economic and environmental value. A systematic synthesis is essential to bridge this gap, providing a clearer understanding of the mechanisms driving value creation, delivery, and capture in CBMs. Thus, this study aims to answer the following research question on how CBMs create value and what are the sources of such value: RQ1: how do CBMs create value?

Moreover, the studies about drivers and barriers to adopting these models remain scattered, particularly in relation to industry-specific characteristics as highlighted by Bocken and Geradts (2020). In fact, barriers and drivers are separately studied in relation to generic CBMs (Geissdoerfer et al. 2023), and in relation to specific contexts such as CBM innovation or industry-specific context. The literature appears to be more focused on drivers than on barriers, which receive comparatively less emphasis in some respects. Drivers are investigated in many instances, but only in specific contexts, such as eco-labeling and CBM in relation to the IoT sector (Meis-Harris et al. 2021; Rejeb et al. 2022). Barriers, on the other hand, have received scarce attention. In fact, despite some studies having summarized barriers of subsectors of CE, such as the Latin American market or eco-labeling, they have been studied systematically only by Cappelletti et al. (2022), but not in combination with the drivers of CBMs (Betancourt Morales and Zartha Sossa 2020; Cappelletti et al. 2022; Meis-Harris et al. 2021). Thus, a systematic approach that analyzes drivers and barriers across all relevant aspects, including industry, firm maturity, and strategic objectives, is needed to better understand and approach this phenomenon. In pursuit of these objectives, this study seeks to address the following research question: RQ2: What are the key drivers and barriers of CBMs?

To address such research questions, we conduct a systematic review of the CBM literature. Specifically, we answer RQ1 and RQ2 through a bottom-up approach that examines the four basic characteristics of CBMs, namely definitions, drivers, barriers, and value. We identify three clusters of investigation. These are the Circular BM (CBM) (i.e., how companies do business with circularity), the CBM transformation (i.e., the transformation of existing BM from linear to circular), and the CBM strategy (i.e., the way to implement the CBM).

Finally, to the best of our knowledge, no studies have comprehensively addressed these clusters together. In fact, even the most recent literature does not approach all the dimensions at the same time but separately (Woldeyes et al. 2025; Bocken 2024; Hoang and Böckel 2024). For example, Bocken (2024) focuses on the innovation aspect of the CBM, while Woldeyes et al. (2025) provide an overview of the CBM archetypes. Interestingly, Vann Yaroson et al. (2024) performed the most comprehensive literature review so far on CE by connecting research streams with SDGs, but by prioritizing the circular economy lens, they disregard the business model focus. Therefore, in this work, we aim to extend this stream of literature by focusing specifically on the business models that pertain to the circular economy and extend the current understanding by providing a unified framework that structures the extant CBM research. RQ3: what are the gaps in the research about CBMs?

Integrating these clusters into a unified framework is essential for developing a holistic understanding of CBMs. Our approach allows us to identify common concepts and main differences in the three investigation clusters, and to identify gaps in the literature. The paper contributes to the literature on CBMs by identifying the main gaps in CBM research that can be summarized from three different perspectives: the market value creation, comprehensive BM, and firm maturity ones. For instance, we argue that research effort needs to be made in the direction of associating CBM strategies and CBM sources of value in a comprehensive BM description that links coherently each source of value of circularity to all the components of a BMs. Moreover, research must also address understanding and classifying the sources of differentiation and price leadership that circularity can create, as well as understanding its peculiarities across the different stages of firm lifecycle.

The paper is structured as follows. First, the employed method for the systematic literature review is described in Section 2. Section 3 presents the findings of the literature review, namely the articulation of the contributions in three clusters of investigations. Clusters are analyzed and discussed according to their dimensions. In Section 4 we discuss the gaps in the CBM literature, and we provide the framework for future research in the field. Finally, we conclude in Section 5.

2 | Methodology

The methodology used to pursue the objective of this study is a systematic literature review (SLR). The systematic literature

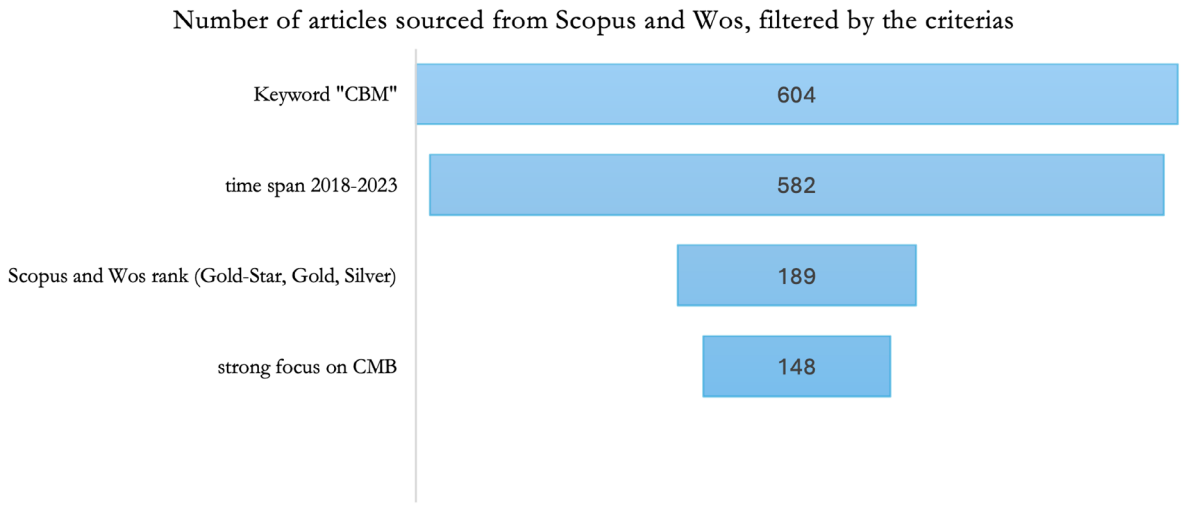

FIGURE 1 | Paper selection funnel.

review is a well-recognized and appropriate methodology for identifying existing knowledge and relevant gaps in the literature. Using this method is, therefore, suitable for understanding the drivers, barriers, and value creation of CBMs while identifying gaps in the existing research on each of these dimensions.

2.1 | Identification and Selection Process

The methodology used for conducting the SLR encompasses a structured identification and location process. The identification phase began with the formulation of our research scope and the selection of keywords based on prior literature and emerging trends in CBMs. Particularly, the keywords selection was performed through a preliminary review of seminal literature review papers in the field of CBM (e.g., Geissdoerfer et al. 2023; Centobelli et al. 2020). This process involved first the identification of keywords associated with the foundational studies. Second, an iterative verification step was subsequently conducted to refine the selection, ensuring that the chosen keywords were consistently present across the examined literature. The identified search keywords are: "Circular Business Model", "Transformation", "Business strategy", "Business Model", "Industrial Symbiosis", "Circular economy", and "Sustainability".

In the article selection phase we systematically searched the "Scopus" database using Boolean operators among combinations of the seven keywords to refine the search results. The Scopus database was chosen as it is one of the most comprehensive and widely recognized databases used in literature review studies, featuring a broad coverage of high-quality papers (e.g., Acerbi and Taisch 2020; Rejeb et al. 2022; Geissdoerfer et al. 2020). It is noteworthy that Scopus is a larger journal repository than Web of Science. We restricted the article search to a publication year time window ranging from 2018 to 2023 to limit our analysis to the most recent contributions, while maintaining a sufficiently large sample size. From the resulting sample we excluded all the articles unrelated to the fields of economics, business, and management. Subsequently, we applied journal quality ranking criteria, by excluding articles published in journals simultaneously pertaining to quartiles lower than the second of the Web of Science Article Influence Score, lower than the second best class in the UK-based ABS Journal Guide and in the French CNRS journal ranking, and lower than the second decile of the Scopus-Scimago SJR. The only exception for this rule was the case of journals that were simultaneously ranked in the third quartile/class/decile in the respective database, in which case the articles remained under our consideration. Note that the use of decile in Scopus and quartile in Web of Science is due to the fact that Scopus is a much larger repository of journals. We used these threshold criteria to ensure the selection of articles of sufficiently high quality in the areas of economics, business, and management. Finally, we further restricted to articles having a clear focus on CBMs. This procedure was performed by analyzing the abstract and the whole paper, if necessary. Applying the above criteria yielded a final sample of 148 papers, gathered in April 2023 (see the Tables A1 and A2 for a detailed list). Figure 1 outlines the above-described procedure for screening the initial number of papers retrieved from Scopus, and reports the number of papers considered in each step. Figure 2 outlines the complete SLR process. Figure 3 shows the journals in the final sample, with the number of articles for each journal. The journal that has published the highest number of articles is the "*Journal of Cleaner Production*" (67 papers). Figure 4 shows the number of selected papers per year of publication. The highest number of articles can be found in the year 2022 (43 articles).

After the identification and selection of the articles, the next step was the systematic literature analysis to fully assess the content of the papers. The analysis entailed two phases: (1) the dimension analysis and (2) the cluster definition and paper categorization.

2.2 | Thematic Analysis and Clustering

The thematic analysis has been performed using four common dimensions of BMs, namely Definition, Drivers, Barriers, and Value. The 4 dimensions were chosen as the most analyzed

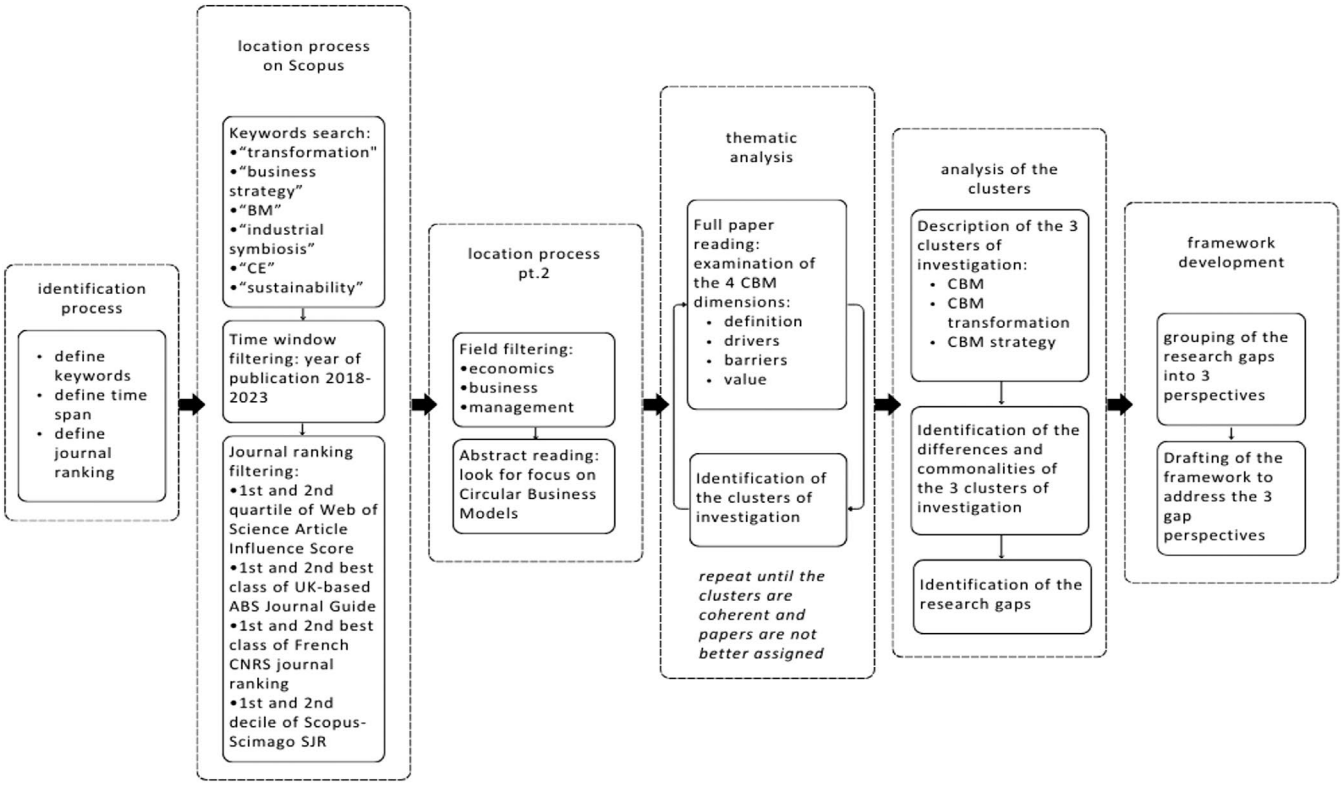

FIGURE 2 | Systematic literature review process.

in the 20 literature review articles (listed in Table 1) of the total 148 papers analyzed in this article. The Definition dimension discusses the most significant propositions that can explain the entity, finality, and main characteristics of a CBM (Geissdoerfer et al. 2020). In the Drivers and Barriers dimensions, we discuss factors that either enable, promote, and facilitate or prevent, obstruct, and hinder an organization in ideating, implementing, or managing a CBM (Geissdoerfer et al. 2020; Santa-Maria et al. 2022). Finally, we examine the Value dimension, starting with the concept of a BM, as a similar approach to Bocken et al. (2014). Value creation is at the heart of any business model; businesses typically create value by seizing new business opportunities, new markets, and new revenue streams (Teece 2010). While the value is typically associated with the product and service offering to generate economic return, in a circular business, the value, tangible or intangible, would provide measurable ecological and/or social value in concert with economic value (Boons and Lüdeke-Freund 2013). Value delivery is the way that such tangible or intangible value is transferred to customers and other stakeholders through circular products: for example, how the product or service is usable by the consumer or which relationship is established with the channels. Value capture is about considering how to earn revenues (i.e., capture value) from the provision of goods, services, or information to users and customers (Teece 2010).

Finally, the cluster definition and paper categorization into clusters was carried out. This phase entailed first the full paper reading, second the identification and description of the information about the 4 dimensions of CBMs. Third, the identification of similarities between the four dimensions and the research topic guided the cluster creation. Through an iterative process, we grouped the papers in clusters according to the most prominent research topics and similarities between the four dimensions that each article provided. The articles were read independently by two PhD students specializing in the field of Circular Economy, who read the articles and preliminarily grouped them. Consequently, a consensus discussion was conducted between the two PhD students and two senior researchers experts in the same field. After two sessions of consensus discussion, the clusters were defined as "CBM", "CBM Transformation", and "CBM Strategy."

3 | The CBM Clusters

3.1 | Cluster 1: Circular BM—CBM

This cluster consists of 38 articles all dealing with the concept of CBM, namely how companies do business with circularity.

3.1.1 | Definition

In literature, different definitions of CBM have been provided. Opferkuch et al. (2021) and Rosa et al. (2019) conducted two literature reviews on the CBM definitions. It emerges that some definitions focus on the concept of resource and process efficiency. A CBM "is how a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending the useful life of products and parts (e.g., through long-life design, repair, and remanufacturing) and closing material loops." Another group of

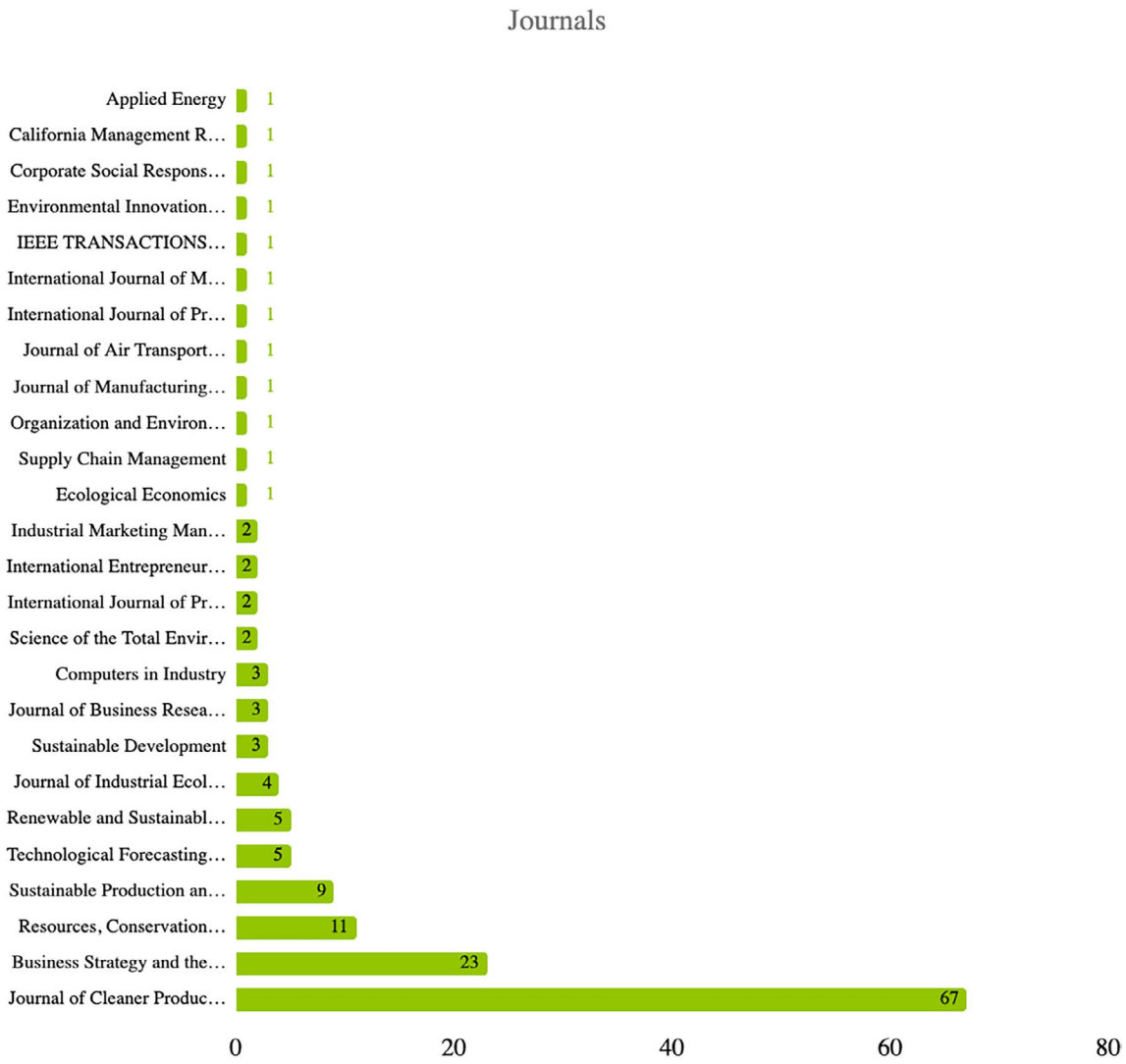

FIGURE 3 | Distribution of selected articles by publishing journal.

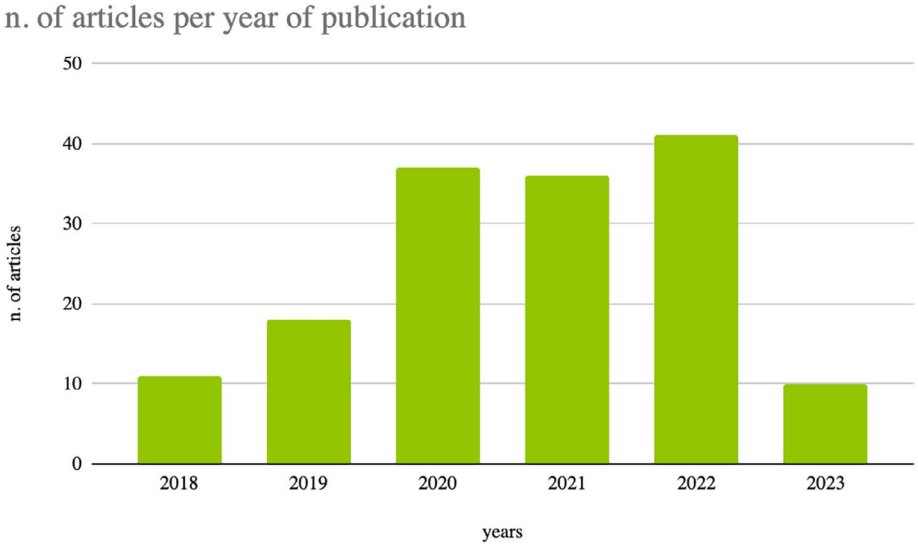

FIGURE 4 | Distribution of selected articles by year of publishing.

TABLE 1 | Literature reviews about CBM and CE.

Author(s) and year	Focus	Theoretical background	Methodology	Main contribution
Geissdoerfer et al. 2017	Circular economy	Circular economy	Systematic literature review, bibliometric analysis	Identifies eight relationship types between CE and sustainability, clarifying their conceptual overlap and differences
Geissdoerfer et al. 2018	Business model innovation	Sustainable business model innovation	Systematic literature review	Reviews key concepts, identifies research gaps, and explores reasons for business model innovation failures
Pieroni et al. 2019	Business model innovation	Circular economy	Systematic literature review	Categorizes 94 publications on business model innovation for CE and sustainability, identifying research gaps
Centobelli et al. 2020	Circular Business model	Circular business models	Systematic literature review	Provides an overview of business model design in CE and outlines a research agenda
Geissdoerfer et al. 2020	Circular business models innovation	Circular Business Models	Systematic literature review, cross-reference snowballing	Reviews definitions and frameworks for circular business models and circular business model innovation
Schöggl et al. 2020	Sustainable development	Circular Economy	Mixed-methods approach (bibliographic network analysis, topic modeling, content analysis)	Identifies two research streams (management and technical), discussing gaps in social sustainability
Meis-Harris et al. 2021	Product labeling in circular economy	Behavioral economics	Rapid literature review	Assesses the effectiveness of product labeling in CE, highlighting limited impact and suggesting improvements
Opferkuch et al. 2021	Corporate sustainability reporting	Circular economy	Systematic literature review, content analysis	Examines how companies report CE efforts, identifying gaps and challenges in external communication
Chauhan et al. 2022	Digital technology	Circular economy	Systematic literature review	Explores digital technologies (AI, IoT, blockchain) in CE, identifying barriers and highlighting the role of PSS
Rejeb et al. 2022	Internet of things	Circular economy	Systematic literature review	Identifies enablers, barriers, and research gaps in leveraging IoT for circular practices
Silva and Pålsson 2022	Industrial packaging	Circular economy	Systematic literature review	Reviews industrial packaging research, identifying key themes and gaps, particularly in packaging reduction
Ghafoor et al. 2023	Product-service systems in housing	Circular economy	Integrative literature review	Proposes a framework for PSS in housing, focusing on energy, material, and space efficiency

definitions describes CBMs focusing on the added value brought by circularity. For example, "the business model's key role is to incorporate the CE principles into a design or redesign of business activities and partnerships and to create a cost and revenue structure, which is compatible both with sustainability and with profitability" (Zucchella et al. 2022) and "circular and sharing BMs enable companies to improve the sustainability of their business practices within and beyond organizational boundaries while also creating a competitive advantage" (Antikainen et al. 2018).

Accordingly, our analysis identifies two different focuses of CBM definition: one focused more on resource and process efficiency, namely resource efficiency and consequently a cost reduction brought by CBM implementation; one focused on circularity added value, namely how the implementation of the circularity principle allows obtaining a competitive advantage.

3.1.2 | Drivers

Drivers, or enablers, are factors that foster the development, implementation, and success of CBMs, so they play a pivotal role in CBMs' accomplishments (Mondal et al. 2023). Multiple articles in this cluster dimension have focused on drivers of CBM implementation (Bertolucci Paes et al. 2019; Centobelli et al. 2020; Jia et al. 2020; Marrucci et al. 2019; Meis-Harris et al. 2021). A minor number of articles, conversely, have focused on the classification of drivers in specific subdomains of CBMs. According to our review analysis it is possible to classify CBM drivers into business, institutional, technological, and customer-driven (Mondal et al. 2023; Jia et al. 2020). Business drivers are mainly endogenous to the organization and can be divided into competitive and supply chain based. Competitive drivers are mainly concerned with the value creation and the competitive advantage brought by circular BMs. For instance, Centobelli et al. (2020), define drivers for each of the value chain phases, that is, value creation, value delivery, and value capture. Salvador et al. (2020) group drivers according to the BM canvas dimensions. Bertolucci Paes et al. (2019) and de Kwant et al. (2021) study the opportunities for value creation and produce a list of drivers respectively to the CBM organic waste management and the electric vehicle and white goods industries. Marrucci et al. (2019) identify the business opportunities springing from sustainable consumption and production. Supply chain based drivers recognize the value brought by a circular organization of the supply chain. Aarikka-Stenroos et al. (2022) highlight the value brought by supply chain collaboration and supply chain collaborative arrangements. Centobelli et al. (2020) highlight drivers such as "process redesign", "take-back system implementation", and "cyber-physical technological systems." Salvador et al. (2020) underscore drivers related to the power of "efficient logistics", "technological development", and "waste collection and storage systems." Bertolucci Paes et al. (2019) identify success factors, such as logistic cost and supply chain management, availability and homogenization of raw materials, and the quality and efficiency of alternative products. Lastly, Meis-Harris et al. (2021) highlight the importance of trustworthy and transparent labeling schemes associated with tangible environmental credentials to distinguish certified circular products from non-certified ones.

Institutional drivers are mainly exogenous to the organization and consider external factors that push toward the adoption of CBM. For instance, Mies and Gold (2021) analyze some social dimensions, whose components are workers, customers, the local community, and society that push toward the adoption of CBM. Within this kind of drivers, a high degree of attention has been paid to policies. Mies and Gold (2021) underscore the legislative action to drive the adoption of CBM-related practices in general. Zhu et al. (2019) emphasize the importance of regulations about the use of industrial solid waste, wastewater, waste gas, and recycling of scrap metals as drivers for the adoption of CBMs. Camilleri (2020) highlights the role of policymakers in providing "technical assistance", "mobilizing financial resources", and "facilitating positive impact investing" in CBMs. Marrucci et al. (2019) mention the integration of "SCP tools" in national policy-making.

High attention has also been devoted to technological-related drivers. Technological drivers are highlighted by Mondal et al. (2023), who emphasize the significance of "technology-based enablers" and "effective technological infrastructure facilities" in promoting green entrepreneurship for CBMs. Jia et al. (2020) also emphasize the importance of technological innovation as an enabler for applying a CBM. de Kwant et al. (2021) point out the role of "product design" in driving CBMs. For example, efficient technology can help manage waste, increase efficiency, and develop efficient production processes for becoming more circular businesses.

Finally, customer-driven drivers are related to the customer demand for sustainable and circular products. This driver is less developed in our analysis since only Meis-Harris et al. (2021) classify drivers according to consumer purchase behavior.

The analysis of the individual drivers of CBM, that is, business, institutional, technological, and customer-driven, can be viewed also in light of their mutual interactions. Business drivers, particularly those related to competitive advantage and supply chain efficiency, often depend on technological advancements to optimize circular processes, such as waste management, product design, and logistics (Centobelli et al. 2020; Salvador et al. 2020). Similarly, institutional drivers, such as regulatory frameworks and policy incentives, create external pressures that encourage firms to adopt and invest in technological innovations that facilitate CBM implementation (Mies and Gold 2021; Zhu et al. 2019). Technological advancements, in turn, enhance the feasibility of regulatory compliance by enabling firms to develop sustainable solutions that align with policy expectations (Mondal et al. 2023). Moreover, customer-driven drivers interact with both business and institutional drivers, as increased consumer demand for sustainable products influences corporate strategies and regulatory responses (Meis-Harris et al. 2021). For instance, transparent labeling schemes, supported by both institutional policies and business interests, serve to enhance consumer trust and stimulate market demand for circular products. Ultimately, these drivers do not function in isolation; rather, they form a dynamic network where some drivers in one

domain can catalyze the positive effect of others, creating a synergistic effect among them.

3.1.3 | Barriers

The literature review has revealed numerous barriers to the successful implementation of CBM. They can be grouped into different categories according to topic and content similarity.

Some authors have identified the lack of policy and regulations as the main source of barriers. Camilleri (2020) states that the lack of policy fostering financial green investments hinders the SMEs' possibility to implement CBMs due to insufficient financial resources. Bertolucci Paes et al. (2019) and Jia et al. (2020) highlight how the lack of technical standards and regulations discourages the development of a CBM since circular products are more technically complex to develop and require public policy support to meet the technical needs. Finally, Grafström and Aasma (2021) focus on the inconsistencies in policies in the different countries that hamper the cross-national implementation of CBMs.

Another barrier regards financial and investment issues. Camilleri (2020) underlines the difficulty for small enterprises in assessing sufficient financial resources for green investments. Jia et al. (2020) and Abdelmeguid et al. (2022) highlight the lack of financial support, which impedes companies' capabilities to adopt CBMs, a lack of performance measurement systems, and a lack of infrastructure investments as major barriers to CBMs.

Customer-related barriers are also critical in driving the demand for circular products and services. Sinha (2022) highlights customer perception as a micro-level barrier, while Camilleri (2020), Abdelmeguid et al. (2022), and Grafström and Aasma (2021) point out low consumer awareness. They state that the lack of demand and awareness can deter businesses from adopting CBMs, as there may be limited market viability for circular products.

Also, technical and operational knowledge poses challenges to the implementation of CBMs. Bertolucci Paes et al. (2019) and Camilleri (2020) highlight logistic costs, seasonality, lack of raw material homogenization, and the quality and efficiency of alternative products. Grafström and Aasma (2021) mention technological barriers, such as the design for product-life extension and repair, waste separation, and lacking IT systems for measurement and monitoring. De Kwant et al. (2021) and Sinha (2022) focus on more product-specific technical barriers, addressing electric vehicles and white goods barriers (i.e., large electrical home appliances). These are high recycling and recovery costs, as well as path dependency in channels and manufacturers. Finally, Sinha (2022) highlights the lack of impact measurement techniques and organizational entropy, as every process of recycling, recovering, and disposal requires energy and leads to waste creation and pollution.

Finally, organizational and cultural barriers also play a significant role in the adoption of CBMs within the company (Abdelmeguid et al. 2022; Bertolucci Paes et al. 2019; Grafström and Aasma 2021; Jia et al. 2020; Sinha 2022). A major barrier to CBM implementation is the lack of company culture regarding green and circular products and BMs and the lack of top management support. In addition, Grafström and Aasma (2021) mention confidentiality regarding production processes as a barrier to the collaborative supply chains that enable CBMs. Lack of training and education is mentioned by Jia et al. (2020) as another barrier to CBM implementation. Authors focus attention also on barriers regarding communication and strategic aspects. Jia et al. (2020) ex-ante strategic planning and IT system implementation, and ex-post lack of strategic planning and performance measurement of CBMs.

3.1.4 | Value

Value in CBMs has been explored by various authors. The majority of authors have focused on value creation by identifying two main sources of value creation: circularity and servitization.

About circularity, Mendoza et al. (2022) stress reverse logistics as a necessary condition to recover materials from waste and save on production costs to create value. Gallego-Schmid et al. (2020) highlight the role of material loops in the construction industry as a source of value. Kim et al. (2022) discuss circular concepts, such as the integration of recyclability, repairability, and reusability into product design guidelines. Eisenreich et al. (2022) classify value-creation activities in CBMs using Porter's value chain framework. The value-creation activities are based on the procurement of raw materials from recycled sources, the implementation of efficient production processes for waste reduction, and the development of strategies for the reuse or recycling of end-of-life products. Galvão et al. (2020) focus o*n how ecosystems can create value. For example, some companies can collaborate with suppliers to establish CBMs aimed at recycling waste, which is transformed into new products, contributing to circular value creation and reducing the environmental impact of the industry itself. Valve et al. (2021) underline how the recovery of wastes and side-flows in the biogas industry can create value. Donner et al. (2020) discuss how food and agriculture industries can create value for each other from agricultural waste and by-products. For example, food industries can use agricultural waste to produce compost, and therefore fertilizers rich in nutrients. These products can then be used in the field of agriculture and gardening, contributing to sustainable cultivation. Lüdeke-Freund et al. (2019) review how companies create value in closed-loop supply chains. For instance, mobile device manufacturers offer the opportunity for customers to return their old devices for proper recycling or refurbishment, by allowing useful materials to recover and hence reducing the need for virgin resources. Puntillo et al. (2021) examine absorbent hygiene product waste as a resource for new products. For example, this type of waste can be collected and transformed into raw materials for the production of ecological materials, to avoid them being wasted. Centobelli et al. (2020) identify managerial practices for value creation, such as design for recycling, design for remanufacturing, and design for disassembly. For example, automakers implement remanufacturing programs for mechanical components: rather than producing them new, they collect used components, refurbish them, and then reintroduce them to the market.

Some other authors locate servitization as a source of value for CBM. For instance, Rosa et al. (2019) highlight product-service systems (PSSs) oriented and reuse, remanufacturing, and recycling (3R)-based CBMs as sources of value. Some furniture companies offer customers the opportunity to rent the products for a specific time so that at the end of the period, the furniture is returned to the company, which refurbishes, repairs, and then rents it again to new customers. This approach reduces waste and increases the useful life of the products.

The analysis of the value creation sub-dimension reveals how CBM can generate tangible and intangible benefits for circular companies to create, deliver, and capture within CBMs. The tangible benefits of CBM value creation include cost savings from waste reduction and extended product lifecycles. For instance, modular smartphones, like Fairphone, reduce electronic waste while offering customers a cost-effective alternative to frequent device replacement (Lüdeke-Freund et al. 2019). Intangible benefits include increasing value for customers that prioritize sustainability to access sustainable goods (Rosa et al. 2019).

Regarding value delivery, authors have studied the ways that value is conveyed to customers and stakeholders. Mendoza et al. (2022) mention community-owned wind parks and aggregator platforms as means to get access to the value created from circular wind farms. For example, residents can invest collectively by becoming owners of wind farms and benefiting from renewable energy production. Kim et al. (2022) discuss the use of digital technology platforms for maintaining or monitoring services provided to customers. For example, through advanced technology systems, it is possible to have real-time monitoring of the performance of the recycling and remanufacturing equipment, making maintenance operations more efficient. This practice allows for an increase in the life of the equipment. Electronic producers in Singapore deliver value through mutually agreed-upon outcomes and integrated solutions. For example, an electronic device manufacturer seeks to produce products that are durable and energy-efficient, while providing the customer with continuous value and optimal performance throughout the product lifecycle.

The analysis on CBM value delivery reveals that to deliver the value created by CBMs, companies must ensure circular solutions are high-quality while being economically competitive for both customer and producer. For example, IKEA's furniture rental system exemplifies this because it delivers the value by allowing customers to use high-quality furniture at fair prices, while it creates value by minimizing waste (Rosa et al. 2019). Tangible benefits of delivering circular products include durability and repairability. The way consumers use circular products produces value because of the longer expected life and modularity of the product. However, if circular products are perceived as less reliable or less convenient than traditional alternatives, market acceptance remains a challenge (Eisenreich et al. 2022). To deliver both tangible and intangible value, it is then crucial for companies to perform market acceptance analysis and address consumer unreadiness or unacceptance through communication strategies to convey reliability. Businesses that effectively communicate their circular initiatives can foster stronger emotional connections and brand loyalty, ultimately delivering CBM values (Kim et al. 2022).

In terms of value capture, Mendoza et al. (2022) describe material contracts and service-based contracts as the main sources of income in CBMs. For example, an electronic device remanufacturing company may contract with suppliers to source used parts for refurbishment, providing maintenance and repair services to customers for their devices. Kim et al. (2022) mention rental or leasing fees as value capture mechanisms. For example, a company that specializes in providing shared mobility services offers electric scooters for rent on an hourly basis. Customers pay a rental fee for the duration of their use, allowing the company to capture value based on the usage of the scooters rather than selling them outright. Valve et al. (2021) focus on revenue generation in the bio-gas industry through gate fees and energy outputs. For example, a bio-gas plant may charge waste producers fees for accepting their biowaste. The plant then converts the waste into bio-gas, which is used to generate electricity. Rosa et al. (2019) highlight the importance of subscriptions for capturing value in product-service systems based on reuse, remanufacturing, and recycling in capturing value. For example, some companies offer subscription programs for smartphones: customers pay a monthly fee, while the companies repair, recycle, or refurbish the devices returned by customers.

In sum, value capture in CBMs depends on monetizing circular practices in ways that align with consumer preferences, while ensuring profitability. Subscription-based models, leasing, and pay-per-use systems provide tangible financial benefits by reducing upfront costs for consumers, while generating continuous revenue for companies (Kim et al. 2022). Electric scooter rentals, for example, offer affordability and accessibility, making sustainable transportation more attractive. Meanwhile, intangible benefits are captured by the whole society and environment, such as increased urban mobility and reduced environmental impact. In the food and agriculture sector, for example, value creation occurs through profitable waste valorization, where agricultural by-products are transformed into compost and fertilizers. This process ultimately creates intangible benefits for the society enjoying healthier ecosystems (Donner et al. 2020).

Table 2 summarizes the funding concerning the first cluster, that is, circular BMs.

3.2 | Cluster 2: CBM Transformation

This cluster summarizes papers concerning the transformation process that incumbents face to shift from a linear BM to a CBM. The cluster consists of 52 articles.

3.2.1 | Definition

The CBM transformation definition is quite consolidated in literature; however, definitions differ regarding the focus of the CBM transformation that can stress more: the business perspective, namely the benefits and outcomes of CBM transformation; the process perspective, namely the implementation of the circularity; and the transition perspective, namely the importance of transitioning to an environmental perspective of the business (Corvellec et al. 2022; Parida and Wincent 2019; Suchek et al. 2021).

TABLE 2 | Cluster "CBM" dimensions.

Dimension	Focus	Explanation	Notes
Definition	Process efficiency perspective	Circularity allows more efficient processes and resource utilization	
	Circularity perspective	Circularity produces value for customers	
Drivers	Business-based	Endogenous to the organization. Mainly two components: • Competitive-based (i.e., CBM adoption allows to improve the competition strength of the company by reducing cost and increasing process efficiency) • Supply chain-based (i.e., it is the supply chain advantage that pushes organization towards the CBM adoption)	
	Institutional-based	Exogenous to the organizations. Two main components: • Social (i.e., it is the social pressure that pushes towards the adoption of CBMs) • Policy (i.e., government policies that push toward CBM adoption	
	Technological-based	Exogenous to the organization; it is the technology that pushes toward the CBM adoption	
	Customer-based	Exogenous to the organization; it is the customer demand that pushes toward the CBM adoption	Not very well developed
Barriers	Mainly exogenous	Four exogenous barriers: • Policy-based (i.e., the lack of policies and regulations hamper the CBM adoption) • Funds-based (i.e., the lack of available funds reduces the investments) • Knowledge-based (i.e., CBM requires higher technical and operational knowledge) • Customer-based, (i.e., customers awareness and low sustainable products demand hamper the CBM adoption)	
	Mainly endogenous	Organizational and cultural barriers are recognized as the main constraint within the company to the implementation of CBM	
Value	Creation	Two main sources of value creation: • Circularity (i.e., it is the circularity process that creates value for the firm) • Servitization (i.e., the transformation of a product into a service that creates value for the firm)	
	Delivery	Two main sources of value delivery: communities and digital platforms	Not very well developed and is only for B2B
	Capture	Two main sources of value capture: materials and service-based contracts in B2B and subscription fees in B2C	Not very well developed

Parida and Wincent (2019) highlight that the CBM transformation increases customization and helps companies avoid product commoditization. If managed inside the firm and at the network-partner level, companies can achieve long-term competitiveness, stable revenues, and higher profit margins. Suchek et al. (2021) highlight how a CBM transformation consists of reimagining the value proposal, involving and engaging clients, and forming new partnerships with external parties interested in circularity.

Suchek et al. (2021) also state that CBM transformation is a process consisting of four phases: first, identifying opportunities within the current linear BM; second, assessing the existing linear BM to identify its strengths and weaknesses; third, designing and developing a CBM that aligns with the principles of the CE; fourth, scaling up the BM, validating its effectiveness, and implementing it across the organization.

Corvellec et al. (2022) underline the importance of the CBM transformation within the energy transition. While cyclical systems aim to minimize resource consumption, waste, and emissions, the CBM transformation is based on the need for renewable sources. This transition to renewable energy is fundamental to achieving circular material flows and sustainability.

3.2.2 | Drivers

A significant number of authors have examined the drivers of the CBM transformation. These contributions make the drivers of CBMs the most studied topic in the present CBM literature. Drivers of CBM transformation can be located at three levels: business, institutional, and technological.

Based on the literature, transition to the CBMs is favored due to its attractiveness for business potential, the possibility to decrease costs, and threats to the business-as-usual (Geissdoerfer et al. 2023; Mhatre et al. 2021; Ormazabal et al. 2018; Salmi and Kaipia 2022; Salvador et al. 2020; Sarja et al. 2021; Susur and Engwall 2023). CBMs are said to increase profitability and competitiveness, as well as yield environmental benefits; they provide new ways to utilize resources, enhance brand reputation, and offer access to new markets and consumers (Geissdoerfer et al. 2023; Mhatre et al. 2021; Salvador et al. 2020; Susur and Engwall 2023) and work opportunities. Also, companies and industries have realized the potential future threat of resource scarcity and chosen CBMs to tackle the threat. Additionally, previous investments made to address their environmental impacts push incumbents to implement CE instruments in their business operations because they help incumbents capitalize on previous investments.

Some authors recognize legal enforcement, such as national and international policies, as a focal driver toward CE transition, both for SMEs and other companies (Hartwell et al. 2021; Pereira et al. 2022; Susur and Engwall 2023; Wasserbaur et al. 2022; Yu et al. 2022). Indeed, policies shape the top-down momentum to accelerate and stimulate the transformation of incumbents to CBMs. Extended producers' responsibility and pay-as-you-throw policies, along with community involvement, have all enabled efficient waste management practices. In this sector, the governments and local administrative bodies in the EU member states have been key enablers of this transition to CE (Mhatre et al. 2021).

Some other authors recognize the use of technologies, such as artificial intelligence (AI), Information technology, and Industry 4.0 as key drivers for the transition to CBMs (Geissdoerfer et al. 2023; Mhatre et al. 2021; Salvador et al. 2020; Wuni 2023). They reckon that AI can help handle technical big data and help consumers familiarize themselves with CBMs through the visualization of the circular life cycle of products, whereas information technology can help plan resource-efficiency activities while determining the salvage value of components and quantifying resource stocks that may be available in a structure or a building for future works. Finally, some authors identify Industry 4.0 as a key driver of the transitions (Burger et al. 2024; Geissdoerfer et al. 2023; Luoma et al. 2022; Salvador et al. 2020; Toth-Peter et al. 2023).

Also, the use of bio-based materials, eco-design, and lean product design is recognized as a driver of CBM transformation (Asgari and Asgari 2021; Geissdoerfer et al. 2023; Mhatre et al. 2021; Salvador et al. 2020; Sassanelli et al. 2020). While eco-design allows the creation of products that are easy to recycle or remanufacture, lean design allows one to respond quickly to consumer preferences while reshaping products that are easy to recycle or remanufacture.

The interplay among the drivers of CBM transformation reveals a peculiar system. Unlike the broader ecosystem of CBM drivers discussed earlier, where consumer demand played a key role in reinforcing institutional and business strategies, the CBM transformation drivers focus more on economic pressures, policy enforcement, and technological evolution. Business incentives, such as profitability and resource efficiency, directly influence the adoption of advanced technologies like AI and Industry 4.0, which optimize material flows and improve circular operations (Geissdoerfer et al. 2023; Wuni 2023). At the same time, regulatory measures not only act as catalysts for change but also create the necessary conditions for technological solutions to be adopted by mandating compliance with waste management and other sustainability standards (Hartwell et al. 2021; Yu et al. 2022). This differs from the prior discussion on CBM drivers, where institutional drivers were seen as external pressures influencing business and consumer behavior. Here, policies actively compel firms to integrate circularity into their core operations. Additionally, product design innovations, such as eco-design and lean manufacturing, function as a crucial link between economic and technological drivers, facilitating adaptability while aligning with regulatory demands (Asgari and Asgari 2021; Salvador et al. 2020).

3.2.3 | Barriers

Exogenous barriers are related to the lack of an unclear policy and/or regulation (Gandolfo and Lupi 2021; Oluleye et al. 2022; Rótolo et al. 2022; Salvador et al. 2020; Sousa-Zomer et al. 2018). Indeed, Gandolfo and Lupi (2021), Salvador et al. (2020), and Sousa-Zomer et al. (2018) believe that inadequate policies, legislation, and regulatory support, as well as a lack of coordination between regulations, create barriers to CBMs. Oluleye et al. (2022) and Rótolo et al. (2022) believe that inadequate policies, legislation, and regulations, together with the complexity of regulations, hinder the implementation of CBMs. Overcoming these barriers requires clear and supportive policies to facilitate the transition to circularity. Another important exogenous barrier is related to the lack of available funds and economic incentives for facing transformation costs (Kanzari et al. 2022; Luoma et al. 2022; Salvador et al. 2020; Sarja et al. 2021; Soni et al. 2023; van Langen et al. 2021). For instance, Sarja et al. (2021) believe that a lack of infrastructure and financial resources hinders

the systemic change needed for the transition to a CE. For example, a small firm aiming to adopt CBMs lacks the necessary financial resources to invest in new infrastructure and technologies required for CE practices. Kanzari et al. (2022) and Soni et al. (2023) argue that insufficient financial resources and high initial costs pose significant barriers to the implementation of CBMs, especially for small and medium-sized enterprises (SMEs). Access to financing options suitable for the implementation of the CE is essential. For example, a small clothing brand struggles to secure the necessary funds to implement a closed-loop production system due to the high upfront costs of acquiring recycling machinery and setting up reverse logistics processes. Another important source of exogenous barrier to transformation is due to the limited understanding and awareness of CE principles among consumers (Guerra and Leite 2021; Guldmann and Huulgaard 2020; Luoma et al. 2022). In particular, Guerra and Leite (2021) and Guldmann and Huulgaard (2020) highlight how a retail company faces difficulty in convincing customers to choose products made from recycled materials due to the lack of awareness about the environmental benefits of circular products. Guerra and Leite (2021) and Luoma et al. (2022) argue that limited customer demand for recycled products, lower prices of virgin materials compared to recycled materials, and misconceptions about the cost and quality of circular alternatives act as barriers to CBMs. For example, a sustainable fashion brand faces challenges in convincing consumers to choose their recycled textile products over cheaper conventional options due to the perception that recycled products are of lower quality or less fashionable.

The main endogenous barriers concern the uncertainty of profitability of CBM (Sarja et al. 2021), the lack of organizational resources and culture (Asgari and Asgari 2021; Hartwell et al. 2021; Santa-Maria et al. 2022; Bertassini et al. 2021; Gandolfo and Lupi 2021; Geissdoerfer et al. 2023; Rótolo et al. 2022; Salvador et al. 2020; Soni et al. 2023; Sousa-Zomer et al. 2018; Susur and Engwall 2023; Wuni 2023) and difficulties in supply chain integration and collaboration (Gandolfo and Lupi 2021; Geissdoerfer et al. 2023; Guldmann and Huulgaard 2020; Salmi and Kaipia 2022; Kanzari et al. 2022).

Sarja et al. (2021) argue that the current linear economic model is deeply embedded in all aspects of business, making it difficult to dismantle and replace. Regulations and the prevailing business environment often favor the linear model, causing cynicism and resistance to circularity. For example, a manufacturing company is unsure of how adopting CBMs will impact its long-term profitability, leading to hesitation in making investment decisions due to skepticism about the financial benefits and uncertainties associated with the new approach. Asgari and Asgari (2021) and Hartwell et al. (2021) believe that organizational resistance to change, limited leadership skills, and cultural dynamics that favor linear thinking impede the transition to CBMs. Overcoming these barriers requires management commitment and a change in organizational culture. For instance, a traditional manufacturing company struggles to shift its organizational culture to embrace circular principles due to resistance from employees and a lack of leadership support for the required changes. Santa-Maria et al. (2022) highlight how building decentralized (sustainability-oriented) innovation teams is central to enabling the transition while conducting business as usual. Organizational and cultural factors are also indicated as the main drivers of transformation (Bertassini et al. 2021; Gandolfo and Lupi 2021; Geissdoerfer et al. 2023; Rótolo et al. 2022; Salvador et al. 2020; Soni et al. 2023; Sousa-Zomer et al. 2018; Susur and Engwall 2023; Wuni 2023).

Supply chain integration and collaboration is actually a mix of endogenous and exogenous barriers to transformation. Geissdoerfer et al. (2023) and Guldmann and Huulgaard (2020) believe that supply chain challenges, value chain barriers, such as immature reverse logistics systems, operational uncertainties, and limited collaboration experience, pose challenges to the implementation of CBMs. For example, a furniture manufacturer faces difficulties in establishing efficient systems for collecting and processing used furniture from customers, resulting in operational inefficiencies and increased costs. Guldmann and Huulgaard (2020) and Salmi and Kaipia (2022) believe that limited collaboration between stakeholders, reluctance to involve value chain partners, and difficulties in establishing cross-organizational collaboration hinder the implementation of CBMs. Overcoming these barriers requires collaborative and integrating efforts. Knowledge sharing, information management systems, and training programs are needed to address these barriers. For example, a research institution struggles to gather comprehensive data and share knowledge about CE practices, hindering the development and adoption of CBMs in their industry (Sousa-Zomer et al. 2018; van Langen et al. 2021).

3.2.4 | Value

Some authors, not many actually, in the cluster of CBM transformation have studied how the process of transformation towards CBM entails value creation, delivery, and capture (Asgari and Asgari 2021; Burger et al. 2024; Hobson et al. 2021; Palmié et al. 2021; Rovanto and Bask 2021; Suchek et al. 2021).

The first issue examined in the extant literature is the difference in value creation, delivery, and capture between native CBM and transitioning ones (Palmié et al. 2021; Rovanto and Bask 2021). Rovanto and Bask (2021), in particular, find that, opposite to native CBMs, incumbents only focus on value capturing rather than value creation and delivery. They do not apply significant changes to their current linear BM when transitioning to CBMs, and they do not focus on creating environmental and social value. Conversely, Palmié et al. (2021) find that incumbents transitioning to CBM experiment with original configurations of CBM and value creation, but they adopt alternative value propositions compared to natives.

Regarding value creation, Asgari and Asgari (2021) have identified the need to change the value proposition when transitioning to CBM. In particular, to change the value proposition, three elements need to be considered: new markets, cost-saving, and branding. Moreover, it is necessary to verify the stakeholder acceptance of the new value proposition to ensure the success of the transition.

Hence, the transformation from traditional to circular BMs comes with challenges in value creation to create tangible and intangible benefits. To succeed, companies that transition to

CBMs must redefine their value proposition, explore new markets, and ensure customers and stakeholders accept their new approach (Asgari and Asgari 2021). Many established companies struggle with tangible and intangible creation in transitioning to a CBM. This happens because, unlike businesses that start as CBMs, those transitioning often prioritize cost savings and branding, which are tangible and intangible benefits in the short term over deep changes to how they operate to create value in the long term (Palmié et al. 2021). Because they focus mainly on capturing financial returns rather than redesigning their business model to generate environmental and social benefits (Rovanto and Bask 2021), CBM transformation risks being ineffective in creating intangible benefits.

Concerning value delivery in the transition towards CBM, digital marketing actions have been demonstrated to be the most effective to engage and instruct customers and stakeholders on the advantages of CBMs through content marketing (Asgari and Asgari 2021). Burger et al. (2024) examine how to implement the subscription payment model in the transition from a component supplier to a subscription service provider. They find that for the PSS model to occur, a high degree of customer connectedness through Industry 4.0 technology with the company is necessary and creates a corporation's competitive advantage. Hobson et al. (2021) analyze how the value delivery of circular products, which requires customers' efforts for the use, reuse, and disposal of circular products, does not automatically create value for the consumers.

Concerning value capturing while transitioning to CBM, it is necessary to apply business intelligence tools, such as analytical dashboards, to optimize the cost structure of the CBM's new services, while keeping the linear revenue streams intact and parallel. The value captured in CBM's new services depends on the retrieval of raw materials and products-service-systems (Asgari and Asgari 2021).

Value capture in CBM transitions requires balancing new circular revenue models with existing income streams to capture the tangible financial benefits. Many companies continue to rely on their traditional revenues while slowly introducing circular services (Asgari and Asgari 2021). To make these new services profitable and create tangible financial benefits for the company, they use digital tools like analytical dashboards to optimize costs. However, successful value capture depends also on reliable systems for retrieving raw materials and effectively managing product-service systems to create tangible benefits also in terms of cost saving on materials and intangible benefits in terms of natural resources preservation. For example, companies should adopt specific material conversion or slightly adopt hybrid consumer billing options between buying and lending.

Table 3 summarizes the funding concerning the second cluster.

3.3 | Cluster 3: CBM Strategy

The development and implementation of CBMs challenge companies to develop new strategies or renew their strategic behavior (in the case of incumbents). The cluster CBM Strategy contains 17 papers in total, which were thoroughly discussed as follows. It is noteworthy that all the articles analyzing CBM strategies deal with CBM transformation (i.e., how to transform a linear business into a circular one), not to start with an entirely new CBM. This is the main limitation in the literature concerning the CBM strategy research.

3.3.1 | Definition

From the literature review, a definition of CBM Strategy does not emerge clearly. The most interesting contribution is perhaps provided by Atasu et al. (2021), who define CBM strategies as a way to implement CBMs. The authors affirm that a combination of three strategies retain—product ownership (RPO), product life extension (PLE), and design for recycling (DFR) is the way manufacturing companies develop a transformative CBM.

3.3.2 | Drivers

This paragraph encompasses articles that studied factors that enable the implementation of CBM Strategies (Chen et al. 2020; Dahmani et al. 2021; Kim et al. 2023; Marsh et al. 2022; Moktadir et al. 2020; Van Opstal and Borms 2023; Ghafoor et al. 2023). Basically, it is possible to locate three different drivers: servitization, eco, lean design, and supply chain collaboration.

Servitization is at the base of RPO strategies. By enhancing servitization, a company maintains product ownership by selling related services and improving business sustainability. Ghafoor et al. (2023) investigate how a PSS in the housing sector can drive CBM implementation and attain circular objectives. The findings reveal that PSS provides access to the services derived from their use through a user-oriented model. These services may include space, vertical mobility, heating, and cooling.

Eco and lean design are at the base of PLE and DFR strategies. Dahmani et al. (2021) explore eco and lean design as drivers of CBMs in an Industry 4.0 context. They find that Industry 4.0 facilitates the integration of lean eco-design approaches and operations using the cyber-physical interaction of connected elements and process improvements, resulting in a more flexible, cost-effective, and environmentally friendly CBM manufacturing strategy. Marsh et al. (2022) discuss how joint consideration of eco and lean design perspectives will enable satisfactory CBM strategy implementation in the concrete industry.

Strong supply chain collaborations are also pushing successful RPO, PLE, and DFR strategies. Uhrenholt et al. (2022) investigate how supply chain partnerships and collaborations, rebates for customers on returned products, pay-per-uptime payments, and communicating with customers are drivers for RPO and PLE strategy implementation. Similarly, Chen et al. (2020) study how cross-departmental collaboration and the provision of integrated chemical management systems are the key enabling activities to the implementation of green chemistry principles in the CBM Strategy.

The interaction among the drivers enabling the implementation of CBM strategies highlights a strong interdependence between servitization, lean design, and supply chain collaboration.

TABLE 3 | Cluster "CBM transformation" dimensions.

Dimension	Focus	Explanation	Notes
Definition	Business perspective	It focuses on the business advantages brought by CBM transformation	
	Process perspective	It focuses on the transformation process from linear to circular	
	Transition perspective	It focuses on the link with the environmental transition process	
Drivers	Business-based	Endogenous to the organization. CBMs are attractive for business, improve cost efficiency, and allow to overcome threats to the business as-it-is	
	Institutional-based	Exogenous to the organizations. It is the institutional contest that forces the CBM transformation through legal enforcement and constraints	
	Technology-based	Exogenous to the organizations. It is the technology evolution, such as AI, Industry 4.0 and 5.0, new materials, and so forth, that makes CBM transformation easier	
Barriers	Mainly exogenous	Three exogenous barriers: • Policy-based (i.e., the lack of policies and regulations hamper the CBM adoption) • Funds-based (i.e., the lack of available funds reduces the investments) • Customer-based (i.e., customer awareness and low sustainable product demand hamper the CBM adoption)	
	Mainly endogenous	Three mainly endogenous barriers: • Business-based (i.e., the uncertainty related to the profitability of circular BMs) • Organizational and cultural-based barriers are recognized as the main constraint within the company to the implementation of CBM • Supply chain based (i.e., the difficulties of integrating the supply chain and establishing the needed relations among supply chain partners is seen as a factor that hampers CBM transformation)	
Value	Creation	Differences between native CBMs and transforming ones. Transforming CBM focuses too much on value capturing, neglecting different approaches for value creation. Not enough focus on creating environmental and social value	Not very well developed
	Delivery	Differences between native CBMs and transforming ones Focus on the creation of product-service-systems that strengthen the relation with the customer	Not very well
	Capture	Differences between native CBMs and transforming ones Focus on product-service systems subscription fees for value capturing	Not very well developed

Servitization, primarily focused on maintaining product ownership while offering related services, directly influences the implementation of PSS that are central to circular business models (Ghafoor et al. 2023). By enhancing customer engagement through service-based offerings, companies not only retain control over product life cycles but also contribute to sustainability goals. This driver interacts with both eco and lean design approaches, as these design strategies are fundamental to PLE and DFR, ensuring that products are designed for longevity and easy recycling, which in turn supports servitization models (Dahmani et al. 2021; Marsh et al. 2022). The integration of eco and lean design with Industry 4.0 technologies, which enable the seamless interaction of connected devices and process optimization, further enhances the implementation of circular strategies by making production more flexible, cost-efficient, and environmentally friendly (Dahmani et al. 2021). Supply chain collaboration emerges as a critical enabler, as strong partnerships between companies and stakeholders facilitate the successful

execution of RPO, PLE, and DFR strategies. For instance, initiatives like rebates for returned products or pay-per-use models promote product returns and extend product life, reinforcing the circularity of the business model (Uhrenholt et al. 2022). This driver also intersects with servitization, as supply chain collaborations enable seamless service delivery that complements the product ownership model. Compared to the previous analysis, where technological drivers were more focused on optimizing internal processes, this paragraph highlights the role of external partnerships and strategic design choices in realizing CBM strategies, underlining the need for a more integrated and cross-functional approach to CBM implementation. Overall, CBM strategy drivers are more closely linked than those of CBM and CBM transformation.

3.3.3 | Barriers

Some authors in this cluster have studied the barriers to a successful CBM strategy implementation. While some authors have investigated the barriers to CBM strategy in general (van Loon et al. 2022; Van Opstal and Borms 2023), some others have focused on barriers to specific CBM strategies, such as DFR (Cappelletti et al. 2022) or RPO (Uhrenholt et al. 2022).

The most relevant barrier that authors have identified is related to the cost of transforming the operations. van Loon et al. (2022) examined the process of adopting a CBM strategy in general and identified obstacles to its successful implementation in return logistics, remanufacturing operations, and service contracts. For example, for the RPO, the most prominent barrier is the existing linear production model, while for the recuperation of wastes, the most relevant barrier is the high initial investment cost.

Cappelletti et al. (2022) investigate the barriers to remanufacturing strategy implementation. They find that the two most critical barriers are the costs of the activities that occur at the end of life stage and the urgency to train designers to approach design thinking to the whole product life cycle.

Uhrenholt et al. (2022) investigate barriers related to the viability of the product take-back system, which is part of the "extend product life" strategy. In this case, the author finds that besides the cost of transforming the business operations, other barriers refer to the lack of regulatory homogeneity, the excessive taxation on product weight, and the lack of awareness and trust by financial institutions, and more at the business level, the consumer perception of waste-embedded products as second hand, that decrease their willingness to pay.

3.3.4 | Value

As concerns the value, some scholars have investigated how different CBM strategies differ in creating, delivering, and capturing value (Fernandes et al. 2020; Hultberg and Pal 2021; Palmié et al. 2021; Prieto-Sandoval et al. 2019).

Authors agree that value creation, delivery, and capture are strictly related to the type of CBM strategies implemented (Fernandes et al. 2020). In the RPO strategies, value creation is obtained through servitization principles. The value is delivered through providing services, and it is captured by subscription fees or transaction fees. For example, an EV company might decide to rent vehicles to its customers instead of selling them, by asking for a subscription fee (or pay-per-usage fee). The company will offer additional value to customers with the highest quality of maintenance and will have to make high investments in maintenance facilities. This strategy is particularly effective with complex, expensive, and highly recognized branded products.

In PLE strategies, the main source of value creation is the high quality and reliability of the products that are designed to last longer than usual. The value is normally delivered through own-branded channels and a high level of customer relationships. The value is usually captured through asset sale methods. For example, apparel brands like Patagonia sell long-lasting garments. Consumer electronics manufacturers like Miele can sell remanufactured home appliances at lower prices, thus diverting customers from competitors' products.

Finally, DFR strategies entail a product design made to recover the raw materials and recycle them. In this case, the value is created by leveraging the sustainable considerations of the customer. For example, Adidas produces shoes in collaboration with Parley from plastic recovered from the ocean. This strategy creates additional value for the customer by ensuring a low environmental impact on their product purchase. For DFR strategies, the value delivered is very important because it is quite important that the customer understands the sustainability value of the product. These three strategies can also be combined according to the product or service features. In particular, they take into account their embedded value, the easiness of value recovery from the product, and the easiness of product retrieval.

In addition to the specific strategies, the analysis of the literature reveals how CBM strategy enables firms to generate both tangible and intangible value. Value creation, delivery, and capture in CBM strategy generate both tangible and intangible value by structuring resource flows, collaboration, and process efficiency across different levels of environmental management maturity (EMM) and industry contexts. Prieto-Sandoval et al. (2019) explore CBM strategies for industrial SMEs, emphasizing that firms with lower EMM should prioritize material traceability and basic waste management, while highly mature firms can leverage full material recoverability, digitalization, and industrial symbiosis. These strategies create tangible value through resource optimization, cost reduction, and improved efficiency, while intangible value emerges from leadership vision, environmental awareness, and stakeholder trust. Palmié et al. (2021) further categorize CBM strategies based on resource-sharing orchestration, where lean orchestration emphasizes minimal resource modification and low actor interaction to optimize costs, while resource-driven orchestration enhances tangible value through economies of scale but requires high investment. Actor-driven orchestration fosters intangible value by promoting collaboration and knowledge exchange, whereas dual orchestration integrates both technological resource modification and stakeholder engagement to maximize value creation holistically. Hultberg and Pal (2021) apply a strategic framework in the fashion industry, where companies following closed and

efficiency-centered CBM strategies, such as H&M, create tangible value by leveraging existing infrastructures for resale and waste reduction, while simultaneously capturing intangible value through brand sustainability and customer loyalty. In contrast, open and adaptability-centered strategies, like H&M's collaboration with HKRITA, generate tangible value through technological advancements in recycling and intangible value by enhancing industry influence and fostering innovation. Lastly, da Costa Fernandes et al. (2020) analyze the role of PSS in CBMs, emphasizing that effective circular PSS value propositions require a systemic approach involving multiple stakeholders, iterative prototyping, and a life cycle perspective. Through resource efficiency and economic benefits, PSS creates tangible value, while innovation, collaboration, and long-term stakeholder relationships drive intangible value, highlighting the importance of leadership and strategic alignment with circular economy principles.

Table 4 summarizes the funding concerning the third cluster.

4 | Discussion: The CBM Research Framework

In this section, we discuss the findings arising from our SLR by documenting the juxtapositions among the clusters. This analysis allows us to understand which issues can be considered consolidated in the CBM literature and which ones remain open instead, offering room for further research in the field of CBM (Hossain et al. 2024).

The CBM cluster concerns the intrinsic meaning of CBM, namely how companies do business with circularity, while the CBM transformation cluster concerns the transformation of the BM from linear to circular. Although the two clusters refer to different kinds of situations, they present several overlaps. Both focus on two main dimensions brought by circularity: the *business* perspective, which is how circularity enables the competitiveness of the firm, and the *process* perspective, namely how circularity requires a deep change in the internal and external processes of the firm, such as supply chain integration. CBM transformation also focuses on a transformation perspective, namely how the transformation of the BM from linear to circular is also related to environmental transitions, such as energy transitions.

Both clusters are driven by business, institutional, and technological dimensions (Mondal et al. 2023; Geissdoerfer et al. 2023). The literature recognizes that the advantages brought by the circularity, both in terms of competitive power and supply chain advantages, push toward the firms' adoption or their transition to a CBM (Aarikka-Stenroos et al. 2022; Susur and Engwall 2023). Also, institutional pressures, such as social and policy forces, push firms to adopt or transform their business into a circular one (Mies and Gold 2021; Wasserbaur et al. 2022). Finally, new technologies such as digital, manufacturing, and materials technologies offer incentives toward the adoption of a circular BM (Mondal et al. 2023; Toth-Peter et al. 2023).

In the case of the CBM cluster, a customer-driven dimension is mentioned but less developed (Meis-Harris et al. 2021). In fact,

TABLE 4 | Cluster "CBM strategies" dimensions.

Dimension	Focus	Explanation	Notes
Definition	No particular focus	CBM strategies as a way for implementing circular BMs	Not enough developed
Drivers	Servitization	Servitize the business is the main driver of Retain Product Ownership (RPO)	
	Eco and lean design	New design methodologies are at the base of Product Life Extension (PLE) and Design for Recycling (DFR) strategies	
	Strong supply chain collaborations	Strong supply chain collaborations enable the implementation of RPO, PLE, and DFR strategies	
Barriers	Mainly exogenous	Three exogenous barriers: • Policy-based (i.e., the lack of policies and regulations) • Funds-based (i.e., the lack of awareness and trust from financial institutions) • Customer-based (i.e., customers' perception that re-used or waste-embedded products have low values)	
	Mainly endogenous	The cost of transforming the business operations	
Value	Creation	• For RPO strategies: servitization • For PLE strategies: superior products • For DFR strategies: Design	Strategy dependency
	Delivery	• For RPO strategies: providing services • For PLE strategies: own-branded channels • For DFR strategies: communication to customer	
	Capture	• For RPO strategies: subscription fees • For PLE strategies: assets sale • For DFR strategies: assets sale	

this market perspective as a driver for the adoption of CBM is less studied in the literature, except for the lack of customer awareness and low sustainable product demand as barriers to CBM transformation.

Concerning the barriers to the adoption of CBM, for both clusters, the main exogenous barriers are related to the lack of policies and regulations, so policy-based barriers and the availability of funds needed to support new BMs based on circularity or their transformation (Camilleri 2020; Abdelmeguid et al. 2022; Gandolfo and Lupi 2021; Kanzari et al. 2022). It is also interesting to notice how another barrier is related to *business or customer uncertainty*. For the CBM cluster, this is perceived as an exogenous barrier and relates more to the awareness of customers (Grafström and Aasma 2021). In this case, the question is whether customers are willing to pay for products/services that are more sustainable. In the case of the CBM transformation, instead, the barrier is perceived as more endogenous, being related to the real profitability of circular BMs (Sarja et al. 2021). Shareholders are afraid of the uncertainty about BM transformation and are less available to approve the investments needed.

Organizational and cultural issues are the main endogenous barriers both for CBM and CBM transformation clusters. Most of the authors recognize the lack of culture toward sustainability, lack of knowledge about circularity issues, and organizational resistance to change as the main internal barriers to CBM adoption or transformation (Abdelmeguid et al. 2022; Susur and Engwall 2023).

The *value dimension* of the CBM and CBM transformation is the least developed in the literature. Authors find that servitization and circularity are the main sources for value creation in CBMs. By servitization, we mean the introduction of a PSS brought about by the adoption of a circular BM (Rosa et al. 2019). For instance, renting the product, instead of selling it, a thing that favors the product disposal for reuse, allows creating value for the customer through the service. By circularity, the authors mean that the adoption of a circular BM creates value in terms of cost reduction and therefore lower prices, such as the use of waste materials for the production process (Mendoza et al. 2022). However, it emerges that an approach based on the main sources of value creation, namely differentiation and price leadership, is lacking in addressing this issue. Indeed, while servitization is surely a form of differentiation, and the advantages brought by circularity are surely in the direction of price competition, there are at least several other forms of differentiation that can be brought by the adoption of a CBM, such as enhanced brand reputation due to eco-friendly initiatives, innovation in product design for longer life cycles, and the ability to offer customized or tailored solutions that reduce waste and promote efficiency (Bocken and Ritala 2022; Peçanha and Ferreira 2025). Furthermore, authors in the CBM transformation cluster mainly focus on the lack of studies that address the re-evaluation of the value concept when a business is transformed from linear to circular. The same considerations can be made for value delivery and capture. Indeed, in the CBM cluster, authors discuss how digital technologies allow for better delivery of value to the customers also by improving communities, and, in line with a servitization CBM approach, how subscription-based BMs can help to capture the value brought to the customers (Mendoza et al. 2022; Kim et al. 2022). However, also in this case, there is a lack of studies deeply investigating the issues.

As for the CBM transformation cluster, again the main contributions are related to the difference with native CBMs and so to the re-thinking of the value creation, delivery, and transformation (Palmié et al. 2021; Rovanto and Bask 2021), but no clear indication about the way to execute such re-thinking emerges from our study.

A CBM strategy is defined as the way to implement CBMs. Basically, three kinds of strategies emerge, and all refer to CBM transformation: the RPO, the PLE, and the DFR (Fernandes et al. 2020; Prieto-Sandoval et al. 2019). While drivers and barriers are quite the same as those discussed for the other clusters, the value dimension briefly discusses sources of value for the three strategies as they were CBMs. For instance, authors view servitization as the source of value for RPO strategies and superior products for PLE strategies. Thus, there is a lack of clarity between the concept of BM and the CBM strategy as a way of implementing or executing CBMs.

From the above considerations, we argue that the current research about the CBM topics needs to improve the understanding of how firms undertake circular business at least from three different perspectives: (a) the market value creation perspective; (b) a comprehensive BM perspective; (c) a firm maturity perspective.

4.1 | A Market Value Creation Perspective: Circularity Sources of Value

The first issue concerns the core of a BM concept (Osterwalder and Pigneur 2010), namely how the business builds value for the customer (value proposition). Circular BM literature has so far considered that the concept of circular BMs or sustainable BMs or BMs for sustainability was focused on a more holistic view of value that integrates social and environmental goals to ensure balancing or ideally alignment of all stakeholders (Bocken et al. 2013; Boons and Lüdeke-Freund 2013; Manninen et al. 2018; Schaltegger et al. 2016). Despite this, from our SLR, it emerges that either the way circular businesses create value for the customers is not clear to companies' stakeholders so that it is difficult to support a transition to such BMs (Schultz et al. 2024); or it is the customer itself that does not perceive the value such that customers awareness and low sustainable products demand hamper the CBM adoption. Therefore, we believe that a different approach to value creation is needed in CBM literature, an approach that brings back the creation of value to a market perspective is what companies really need for being profitable. As we have addressed in the SLR, several authors claim how circularity is a source of value in itself, meaning that it is able to create different and/or cheaper products/services, for which customers are available to pay a premium price in case of different products/services, or to buy higher quantities because of a cheaper price (Bocken and Ritala 2022). Therefore, we believe that research needs to understand and classify the sources of differentiation and price leadership that circularity can create when adopted by a company. We call these *sources of value of circularity*. Once the sources of value of circularity are fully understood,

there is no need to claim a new concept of BMs, but just to kind of customers that are the target of each specific source of value. This line of research needs necessarily to include CBM strategies. Indeed, as our SLR clearly evidences, CBM strategies are intimately connected with the source of value. For instance, the RPO strategy creates value for the customer in two ways: (a) the customer does not own the product, implying being free from all the burdens related to it (i.e., maintenance); (b) the customer buys a service, not the product, and this allows the company to be closer to the customer, providing additional services and sources of revenues. Thus, the RPO strategy creates value through differentiation, transforming the product into a service (servitization). However, as our SLR clearly shows, the relationship between CBM strategies and sources of value is limited to three well-established CBM strategies, that is, RPO, PLE, and DFR. All these three strategies allow the creation of value through a differentiation principle. However, the literature has not clearly indicated circularity strategies able to create value by making the product/services more convenient for customers and, furthermore, those strategies have not been linked to any sources of value. Therefore, a research effort needs to be done in the direction of associating CBM strategies and CBM sources of value. This exercise can provide a comprehensive managerial understanding of how to build value with circularity.

4.2 | A Comprehensive BM Perspective: CBM Archetypes

Our SLR suggests that while research has made strides in linking circularity to business models, existing approaches remain fragmented and do not offer a comprehensive, unified perspective. Our study contributes by addressing this gap and proposing a more integrative approach. What we have noticed in our SLR is an attempt to link value proposition to ways of delivering and capturing the value, although this area of research remains underdeveloped (Lüdeke-Freund et al. 2019; Eisenreich et al. 2022). Notably, a comprehensive CBM perspective that integrates multiple sources of circular value across all BM components (Osterwalder and Pigneur 2010) has yet to be fully established. Given that the success and credibility of a BM depend on the coherence between its components and the value proposition (Chesbrough and Rosenbloom 2002; Fjeldstad and Snow 2018), this gap presents an important avenue for further exploration. More specifically, once a value proposition has been conceived, a comprehensive approach requires that the following dimensions are fully defined accordingly and coherently to the value proposition: (a) who the customers are, whether they are business-to-consumer or business-to-business; (b) how customers are reached (channels) and (c) how customer relationships are established and enforced; (d) how value is captured depending on each side of the customer (revenue sources and model). Furthermore, the main (e) resources and (f) activities that sustain the creation of the value and transfer to the customers; (g) what kind of partnerships are needed; and finally (h) what the focus of the cost management is. While the CBM literature has addressed these issues to some extent, it has yet to do so in a comprehensive manner. In our view, what is missing is the definition of CBM archetypes, namely a comprehensive description of a BM that links coherently each source of value of sustainability/circularity to all the components of a BM. Sustainability literature has provided an effort in this direction (Aryee 2024). For instance, Bocken et al. (2014) have defined sustainable BM archetypes according to 8 types of BM innovation brought from technological, social, and organizational drivers. However, types of BMs are not directly linked to the sources of value and, overall, they are analyzed only in relation to the value creation, delivery, and capture dimensions, thus not in a holistic way. More recently, (Pieroni et al. 2020) have proposed an interesting classification of archetypes of circular and sustainable BMs that are based either on adding value to the customer (downstream value) or on cost reduction (upstream value). However, again, they do not clearly identify different sources of value, and overall, archetypes are not described in a comprehensive way by addressing all the dimensions related to a Canvas model (Osterwalder and Pigneur 2010). Therefore, an all-encompassing CBM perspective is still missing in the extant literature. This constitutes one of the findings of the present SLR and highlights an important area for further research development.

4.3 | A Firm Maturity Perspective: Native vs. Transformative CBM

An industry is always characterized by a dynamic between new entrants and incumbent firms. New entry firms are generally startups that bring some innovation to the market, while incumbent firms try to adapt their organization to the innovation brought from new firms to stay competitive (Cozzolino and Rothaermel 2018; Hockerts and Wüstenhagen 2010). In the case of innovation brought by circularity, this dynamic can be observed too (Brändström et al. 2024). Indeed, a further issue that emerges from our SLR is that there are two well-identified clusters of research, one related to CBM and the other related to CBM transformation. The CBM transformation cluster is clearly related to incumbent firms, which try to transform their business according to circularity principles (Suchek et al. 2021). The CBM cluster does not really focus on startup firms, but mostly the papers within this cluster refer to firms that natively undertake circular BMs (Gandolfo and Lupi 2021; Geissdoerfer et al. 2023). As the reader can notice, by comparing Tables 1 and 2, the two clusters have much in common in terms of drivers and barriers. The most significant difference is in terms of "value" where the CBM transformation cluster research is more focused on value capturing (Asgari and Asgari 2021), neglecting different approaches for value creation. This is an important gap in CBM literature because, as it emerges clearly from our SLR, firms willing to transform their business into a more sustainable one need to provide stockholders with business plans assuring the economic sustainability of the new way to do business (Schultz et al. 2024). As a matter of fact, stakeholders' uncertainty is perceived as a barrier to the transformation process to CBM (Guldmann and Huulgaard 2020; Salmi and Kaipia 2022). Thus, identifying sources of value and a comprehensive BM around is an essential step in the transformation process. Furthermore, sources of value and BM archetypes for consolidated firms are not necessarily the same as those for native or startup firms. Indeed, a very recent trend in CBM research concerning circular startup firms (Henry et al. 2020; Kanda et al. 2024) has shown how this type of firm undertakes circularity in a different way from incumbent firms, both from circle strategies (Van Opstal and Borms 2023) and value sources (Lit et al. 2024) viewpoints.

The above considerations call for developing research efforts concerning the sources of value and CBM archetypes according to separate but correlated streams, that is, native (or startups) and incumbent (or transforming) CBMs.

Figure 5 summarizes our findings and the proposed research framework. It shows how the three perspectives we mentioned, the "market value creation", the "comprehensive BM" and the "firm maturity" perspective interact with each other. The "market value perspective" consists of studying how companies, in the two dimensions of the "firm maturity perspective", that is, native (startups) or incumbent (transforming) firms, create value for their customers. Once, value sources are defined, all the components of the BM need to be designed around and coherently under a "comprehensive BM" perspective. Through this framework, we advance existing literature about the sources of value in CBMs and their archetypes and propose a structured approach for future research in two distinct ways.

First, we integrate the perspectives of firm maturity (native vs. incumbent firms) and business model structure into CBM research. While Woldeyes et al. (2025) classify CBM archetypes, and Prieto-Sandoval et al. (2019) classify CBM strategies for different environmental maturity levels, we join and advance their frameworks by distinguishing how these archetypes function across different firm maturity levels. By explicitly mapping CBM archetypes onto the two firm types, we provide new insights into how startups and transforming firms adopt circular strategies differently. This distinction allows for a more tailored understanding of CBM implementation, highlighting the unique challenges and opportunities each type of firm faces.

Second, we extend the understanding of value creation in CBMs by linking it to a structured business model approach. While Bocken (2024) focuses on CBM innovation and connects value sources and CBM innovation components, we extend this framework by including also native CBM companies. Our framework identifies how different sources of value (e.g., resource efficiency, product longevity, sharing models) translate into CBM elements such as revenue streams, customer relationships, and key activities not only for incumbents but also for native firms.

By summarizing these perspectives into a single, integrative framework, we extend extant CBM research and provide a tool that can be used by both scholars and practitioners to understand and perform further research on CBMs from different facets. The framework can be operationalized in empirical research by serving as a lens through which to evaluate CBM adoption across different firm maturity levels, market value perspectives, and sources of value. Specifically, it can guide the design of empirical studies that explore how firms at different maturity stages (startups and incumbents) create, transition to, and adopt CBM strategies. In practice, the framework can be used by businesses to assess their current maturity level and identify key areas for improvement in their CBM implementation. By mapping specific CBM components (such as value propositions, revenue models, and customer engagement strategies) to different stages of firm maturity, companies can better map their

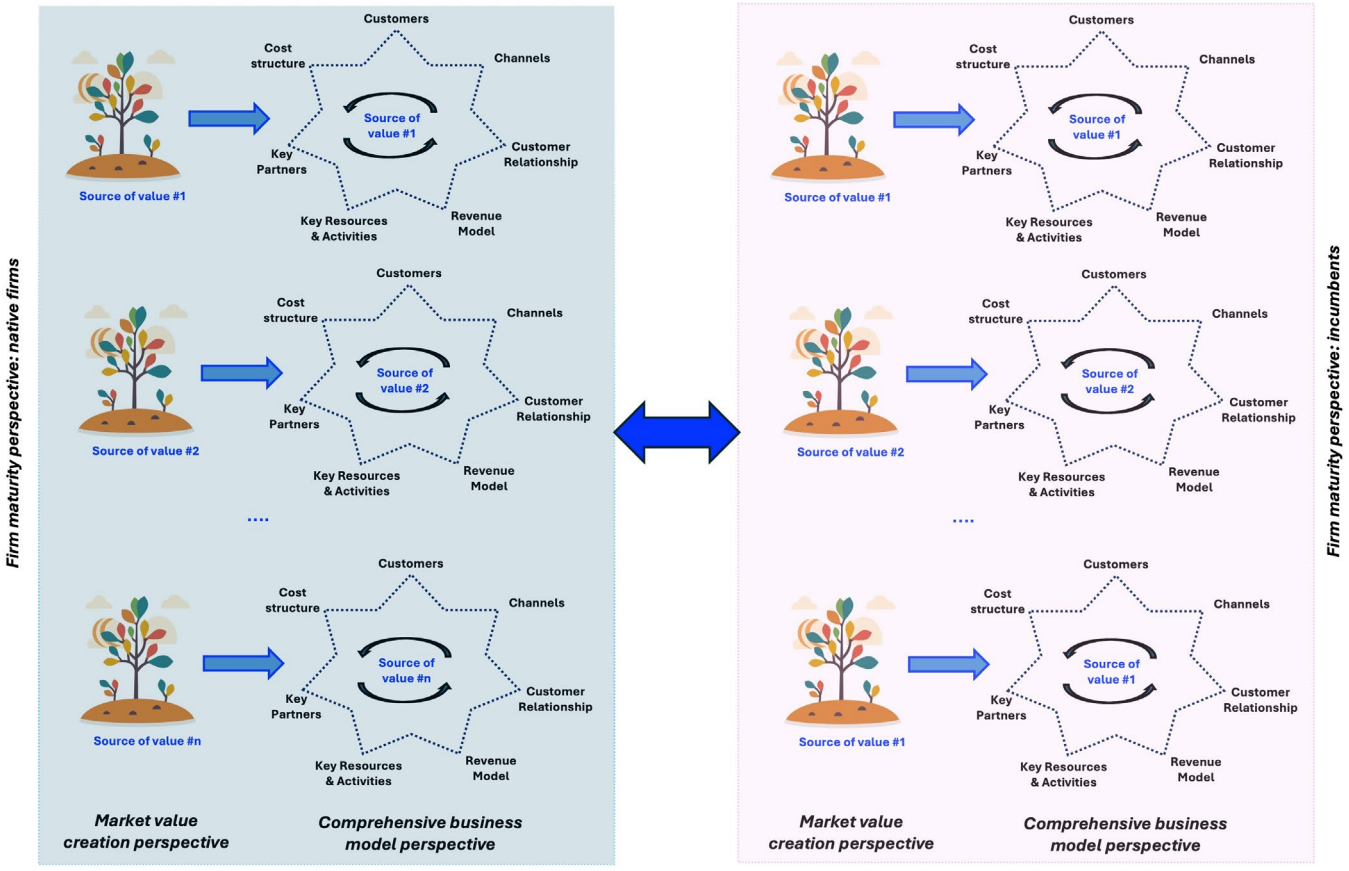

FIGURE 5 | The proposed CBM research framework.

situation and draw strategies on CBM value creation, delivery, and capture.

5 | Conclusions

This paper presents a SLR on the CBM topic. Specifically, the contribution of our study to the CBM literature is twofold. First, we provide a novel classification of the research that contributes to this topic, by locating three different clusters, which we name CBM, CBM transformation, and CBM strategy. Each cluster provides important dimensions that characterize the research, namely definition, drivers, barriers, and source of value. Our clustering approach allows us to compare research findings more effectively. The first cluster presents the findings of the research concerning circular BMs in general, while the second cluster, CBM transformation, presents research regarding the transformation process from linear to circular BMs of incumbent firms. Our analysis reveals that the two clusters have much in common concerning especially definitions, drivers, and barriers. The research on the value dimension is less developed in both clusters and, furthermore, the two clusters differ in the value dimension because the CBM transformation cluster focuses less on the value creation dimension, and more on the value delivery and capture ones. Finally, the CBM strategy cluster focuses on strategies for the transformation process, neglecting the strategy dimension for native circular businesses.

Second, our SLR allows us to identify three important gaps in the literature on circular BMs. The first gap concerns what we call the "market value creation" perspective. Few studies really focus on how companies create value for customers through circularity. These studies that analyze such topics claim from a different approach companies should consider in the value creation perspective, namely associating to an economic and business dimension, a sustainability and social dimension. However, one of the most important barriers to circularity adoption that our study reveals is on the customer's side dimension, namely customers do not really perceive the value brought to them, and on a stakeholders' dimension, namely the stakeholders' uncertainty on understanding the economic and business value of circularity. Therefore, we believe that more research is needed on trying to understand how circularity creates economic and business value for the customer, referred to as "market value creation." Accordingly, to fill this research gap, we call for a research effort able to identify different sources of value that circularity can bring to the market. The second gap concerns what we call a "comprehensive BM" perspective. Indeed, most of the literature contributions do not approach the BM in a comprehensive manner, which implies discussing all the aspects that characterize a BM, such as channels, customer relationship, revenue model, key resources, activities, partnerships, and cost structure. Moreover, this comprehensive discussion is never related and, consequently, coherent with a specific value source. Thus, what is missing in the literature is the definition of CBM archetypes that link all the components of a BM to a specific source of value. Finally, our literature analysis reveals a gap in what we call the "firm maturity" perspective. Indeed, while the CBM transformation cluster is focused on incumbent firms and on their transformation process from linear to circular, only a few recent contributions are focused on those firms that are natively circular, for instance, circular startups. We believe that the research efforts toward the "market value creation" and the "comprehensive BM" perspectives need to focus on both transforming and native companies. Indeed, either source of values or BM archetypes can be similar or different for the two kinds of firms. Accordingly, our research framework proposal is summarized in Figure 5.

This study also contributes to practitioners in native circular firms and incumbents willing to transition to CBM. Based on the study's findings, practitioners should focus on integrating circularity into their value creation processes by emphasizing how CBMs can deliver cost savings, differentiation, and enhanced customer experiences. It is crucial to align all components of the business model, such as customer segments, value delivery, and partnerships, with the value proposition, ensuring that circularity is embedded throughout the organization. Organizations must also recognize that transitioning to circularity requires overcoming internal barriers, such as organizational resistance and a lack of knowledge. Firms should work on building organizational capacity, and incumbent firms might look to startups for innovative approaches. Additionally, addressing external barriers, like policy gaps and financing needs, is essential. Practitioners should engage with policymakers for incentives and explore financing opportunities to support the transition.

To boost customer adoption, practitioners should prioritize customer education on the benefits of circular products and services. This can help overcome skepticism and low demand, while also fostering greater market acceptance. Furthermore, companies should explore and innovate within existing CBM strategies (e.g., Product Life Extension, Retain Product Ownership, Design for Recycling) and seek collaborative partnerships across supply chains to enhance circular processes and create value. Ultimately, focusing on these areas will enable firms to better implement CBMs, overcome barriers, and increase their competitiveness in the circular economy. By providing a new viewpoint in the literature on CBMs and a new framework for future research, we believe this paper makes a valuable contribution to the literature in the field.

We delineate two main avenues for future research. One is certainly related to the empirical test of our framework, as we have explained earlier. The second one relates to the extension of the time window for analyzing articles focusing on CBMs. We restricted the article search to a publication year time window ranging from 2018 to 2023 to limit our analysis to the most recent contributions, while maintaining a sufficiently large sample size. However, given the evolving characteristics of CE, future studies can extend this time window to incorporate more recent studies.

Author Contributions

Eleonora Rizzitello: formal analysis; investigation; data curation; writing - original draft; writing - review and editing. **Alessia Busacca:** investigation; data curation; writing - review and editing. **Paolo Roma:** conceptualization; writing - original draft; writing - review and editing; project administration; supervision. **Giovanni Perrone:** conceptualization; writing - original draft; writing - review and editing; project administration; supervision.

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The article analyzes publicly available data.

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Appendix A

TABLE A1 | List of the 148 papers analyzed in the systematic literature review.

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Ahmad et al.	2023	Business management perspectives on the circular economy: Present state and future directions	*Technological Forecasting and Social Change*	GOLD	2
Burger et al.	2024	Offering Subscriptions of Industrial Goods: Uncertain Experiment or Necessary Step?	*IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT*	SILVER	0
Ghafoor et al.	2023	The product-service system approach for housing in a circular economy: An integrative literature review	*Journal of Cleaner Production*	GOLD	0
Kim et al.	2023	From technology enablers to circular economy: Data-driven understanding of the overview of servitization and product–service systems in Industry 4.0	*Computers in Industry*	SILVER	0
Mondal et al.	2023	Assessing enablers of green entrepreneurship in circular economy: An integrated approach	*Journal of Cleaner Production*	GOLD	0
Morseletto	2023	Sometimes linear, sometimes circular: States of the economy and transitions to the future	*Journal of Cleaner Production*	GOLD	1
Soni et al.	2023	Adaptive distributed leadership and circular economy adoption by emerging SMEs	*Journal of Business Research*	GOLD	0
Susur and Engwall	2023	A transitions framework for circular business models	*Journal of Industrial Ecology*	SILVER	0
Toth-Peter et al.	2023	Industry 4.0 as an enabler in transitioning to circular business models: A systematic literature review	*Journal of Cleaner Production*	GOLD	1
Van Opstal and Borms	2023	Startups and circular economy strategies: Profile differences, barriers and enablers	*Journal of Cleaner Production*	GOLD	1
Aarikka-Stenroos et al.	2022	Companies' circular business models enabled by supply chain collaborations: An empirical-based framework, synthesis, and research agenda	*Industrial Marketing Management*	GOLD	3
Abdelmeguid et al.	2022	Investigating the challenges of applying the principles of the circular economy in the fashion industry: A systematic review	*Sustainable Production and Consumption*	SILVER	11
Agudo et al.	2022	Proposal of an assessment tool to diagnose industrial symbiosis readiness	*Computers in Industry*	SILVER	5
Aguiar and Jugend	2022	Circular product design maturity matrix: A guideline to evaluate new product development in light of the circular economy transition	*Journal of Cleaner Production*	GOLD	4
Alkaraan et al.	2022	Corporate transformation toward Industry 4.0 and financial performance: The influence of environmental, social, and governance (ESG)	*Technological Forecasting and Social Change*	GOLD	36
Awan et al.	2022	Industry 4.0 and circular economy in an era of global value chains: What have we learned and what is still to be explored?	*Journal of Cleaner Production*	GOLD	20
Belhadi et al.	2022	Analyzing the mediating role of organizational ambidexterity and digital business transformation on industry 4.0 capabilities and sustainable supply chain performance	*Supply Chain Management*	GOLD	26

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Blackburn et al.	2022	Digital Platforms for the circular economy: Exploring meta-organizational orchestration mechanisms	*Organization and Environment*	GOLD	1
Brändström and Eriksson	2022	How circular is a value chain? Proposing a Material Efficiency Metric to evaluate business models	*Journal of Cleaner Production*	GOLD	8
Bui et al.	2022	Circular business strategy challenges and opportunities for Industry 4.0: A social media data-driven analysis	*Business Strategy and the Environment*	GOLD	1
Cappelletti et al.	2022	How de-manufacturing supports circular economy linking design and EoL a literature review	*Journal of Manufacturing Systems*	GOLD	4
Cardoso Chrispim et al.	2022	The underrepresented key elements of Circular Economy: A critical review of assessment tools and a guide for action	*Sustainable Production and Consumption*	SILVER	0
Chauhan et al.	2022	Linking circular economy and digitalisation technologies: A systematic literature review of past achievements and future promises	*Technological Forecasting and Social Change*	GOLD	70
Corvellec et al.	2022	Critiques of the circular economy	*Journal of Industrial Ecology*	SILVER	98
Boom Càrcamo et al.	2022	Opportunities and challenges for the waste management in emerging and frontier countries through industrial symbiosis	*Journal of Cleaner Production*	GOLD	11
Eisenreich et al.	2022	Toward a circular value chain: Impact of the circular economy on a company's value chain processes	*Journal of Cleaner Production*	GOLD	1
Geissdoerfer et al.	2022	Drivers and barriers for circular business model innovation	*Business Strategy and the Environment*	GOLD	0
Hussien Rabaia et al.	2022	Recent progress towards photovoltaics' circular economy	*Journal of Cleaner Production*	GOLD	2
Kaipainen and Aarikka-Stenroos	2022	How to renew business strategy to achieve sustainability and circularity? A process model of strategic development in incumbent technology companies	*Business Strategy and the Environment*	GOLD	7
Kanzari et al.	2022	How financial performance is addressed in light of the transition to circular business models—A systematic literature review	*Journal of Cleaner Production*	GOLD	1
Kim et al.	2022	Morphology for circular economy business models in the electrical and electronic equipment sector of Singapore and South Korea: Findings, implications, and future agenda	*Sustainable Production and Consumption*	SILVER	3
Luoma et al.	2022	Future images of data in circular economy for textiles	*Technological Forecasting and Social Change*	GOLD	2
Marrucci et al.	2022	Antecedents of absorptive capacity in the development of circular economy business models of small and medium enterprises	*Business Strategy and the Environment*	GOLD	22

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Marsh et al.	2022	Circular Economy strategies for concrete: implementation and integration	*Journal of Cleaner Production*	GOLD	18
Mendoza et al.	2022	Circular economy business models and technology management strategies in the wind industry: Sustainability potential, industrial challenges and opportunities	*Renewable and Sustainable Energy Reviews*	GOLD	8
Oluleye et al.	2022	Circular economy research on building construction and demolition waste: A review of current trends and future research directions	*Journal of Cleaner Production*	GOLD	16
Pereira et al.	2022	An exploratory study into emerging market SMEs' involvement in the circular Economy: Evidence from India's indigenous Ayurveda industry	*Journal of Business Research*	GOLD	17
Rejeb et al.	2022	The Internet of Things and the circular economy: A systematic literature review and research agenda	*Journal of Cleaner Production*	GOLD	29
Rótolo et al.	2022	Perception and awareness of circular economy options within sectors related to agriculture in Argentina	*Journal of Cleaner Production*	GOLD	6
Salmi and Kaipia	2022	Implementing circular business models in the textile and clothing industry	*Journal of Cleaner Production*	GOLD	1
Santa-Maria	2022	How do incumbent firms innovate their business models for the circular economy? Identifying micro-foundations of dynamic capabilities	*Business Strategy and the Environment*	GOLD	33
Suchek et al.	2022	A review of entrepreneurship and circular economy research: State of the art and future directions	*Business Strategy and the Environment*	GOLD	14
Taqi et al.	2022	What are the challenges that make the journey towards industrial symbiosis complicated?	*Journal of Cleaner Production*	GOLD	2
de Oliveira and Oliveira	2022	What Circular economy indicators really measure? An overview of circular economy principles and sustainable development goals	*Resources, Conservation and Recycling*	GOLD	0
Uhrenholt et al.	2022	Circular economy: Factors affecting the financial performance of product take-back systems	*Journal of Cleaner Production*	GOLD	14
van Loon et al.	2022	Designing a circular business strategy: 7years of evolution at a large washing machine manufacturer	*Business Strategy and the Environment*	GOLD	4
Wasserbaur et al.	2022	Interactions of governmental policies and business models for a circular economy: A systematic literature review	*Journal of Cleaner Production*	GOLD	11
Wuni	2022	A systematic review of the critical success factors for implementing circular economy in construction projects	*Sustainable Development*	SILVER	3
Yu et al.	2022	A systematic literature review on Circular Economy implementation in the construction industry: a policy-making perspective	*Resources, Conservation and Recycling*	GOLD	4

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Zucchella et al.	2022	Proactive and reactive views in the transition towards circular business models. A grounded study in the plastic packaging industry	*International Entrepreneurship and Management Journal*	SILVER	2
Agrawal et al.	2021	Progress and trends in integrating Industry 4.0 within Circular Economy: A comprehensive literature review and future research propositions	*Business Strategy and the Environment*	GOLD	29
Asgari and Asgari	2021	How circular economy transforms business models in a transition towards circular ecosystem: the barriers and incentives	*Sustainable Production and Consumption*	SILVER	23
Awan et al.	2021	Industry 4.0 and the circular economy: A literature review and recommendations for future research	*Business Strategy and the Environment*	GOLD	136
Bertassini et al.	2021	Circular economy and sustainability: The role of organizational behaviour in the transition journey	*Business Strategy and the Environment*	GOLD	25
Bjørnbet et al.	2021	Circular economy in manufacturing companies: A review of case study literature	*Journal of Cleaner Production*	GOLD	59
Dahmani et al.	2021	Smart circular product design strategies towards eco-effective production systems: A lean eco-design industry 4.0 framework	*Journal of Cleaner Production*	GOLD	33
de Kwant et al.	2021	The role of product design in circular business models: An analysis of challenges and opportunities for electric vehicles and white goods	*Sustainable Production and Consumption*	SILVER	10
Dwivedi et al.	2021	Integrating the circular economy and industry 4.0 for sustainable development: Implications for responsible footwear production in a big data-driven world	*Technological Forecasting and Social Change*	GOLD	21
Dzhengiz et al.	2021	Unpacking the circular economy: A problematizing review	*International Journal of Management Review*	GOLD	2
Gandolfo and Lupi	2021	Circular economy, the transition of an incumbent focal firm: How to successfully reconcile environmental and economic sustainability?	*Business Strategy and the Environment*	GOLD	10
Grafstroem and Aasma	2021	Breaking circular economy barriers	*Journal of Cleaner Production*	GOLD	94
Guerra and Leite	2021	Circular economy in the construction industry: An overview of United States stakeholders' awareness, major challenges, and enablers	*Resources, Conservation and Recycling*	GOLD	58
Hartwell et al.	2021	Circular economy of façades: Real-world challenges and opportunities	*Resources, Conservation and Recycling*	GOLD	14
Hobson et al.	2021	Consumption Work in the circular economy: A research agenda	*Journal of Cleaner Production*	GOLD	16
Hultberg and Pal	2021	Lessons on business model scalability for circular economy in the fashion retail value chain: Towards a conceptual model	*Sustainable Production and Consumption*	SILVER	13

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Islam et al.	2021	A global review of consumer behavior towards e-waste and implications for the circular economy	*Journal of Cleaner Production*	GOLD	33
Kanda et al.	2021	From circular business models to circular business ecosystems	*Business Strategy and the Environment*	GOLD	29
Kennedy and Linnenluecke	2021	Circular economy and resilience: A research agenda	*Business Strategy and the Environment*	GOLD	16
Kristoffersen et al.	2021	The effects of business analytics capability on circular economy implementation, resource orchestration capability, and firm performance	*International Journal of Production Economics*	GOLD	62
Mahanty et al.	2021	An investigation of academic perspectives on the 'circular economy' using text mining and a Delphi study	*Journal of Cleaner Production*	GOLD	8
Meis-Harris et al.	2021	What is the role of eco-labels for a circular economy? A rapid review of the literature	*Journal of Cleaner Production*	GOLD	16
Mies and Gold	2021	Mapping the social dimension of the circular economy	*Journal of Cleaner Production*	GOLD	70
Oliveira Pavan et al.	2021	Circular business models for bioelectricity: A value perspective for sugar-energy sector in Brazil	*Journal of Cleaner Production*	GOLD	7
Opferkuch et al.	2021	Circular economy in corporate sustainability reporting: A review of organisational approaches	*Business Strategy and the Environment*	GOLD	31
Palmie et al.	2021	Startups versus incumbents in 'green' industry transformations: A comparative study of business model archetypes in the electrical power sector	*Industrial Marketing Management*	GOLD	20
Reim et al.	2021	Circular business model implementation: A capability development case study from the manufacturing industry	*Business Strategy and the Environment*	GOLD	20
Rusch et al.	2021	Application of digital technologies for sustainable product management in a circular economy: A review	*Business Strategy and the Environment*	GOLD	13
Sandberg and Hultberg	2021	Dynamic capabilities for the scaling of circular business model initiatives in the fashion industry	*Journal of Cleaner Production*	GOLD	12
Silva and Pålsson	2021	Industrial packaging and its impact on sustainability and circular economy: A systematic literature review	*Journal of Cleaner Production*	GOLD	13
Sinha	2021	Circular economy—A way forward to sustainable development: identifying conceptual overlaps and contingency factors at the microlevel	*Sustainable Development*	SILVER	4
Suchek et al.	2021	Innovation and the circular economy: A systematic literature review	*Business Strategy and the Environment*	GOLD	77

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TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Valve et al.	2021	When the circular economy diverges: The co-evolution of biogas business models and material circuits in Finland	*Ecological Economics*	GOLD	7
van Langen et al.	2021	Promoting circular economy transition: A study about perceptions and awareness by different stakeholders groups	*Journal of Cleaner Production*	GOLD	44
Wadstroem et al.	2021	A framework for studying outcomes in industrial symbiosis	*Renewable and Sustainable Energy Reviews*	GOLD	11
Acerbi and Taisch	2020	A literature review on circular economy adoption in the manufacturing sector	*Journal of Cleaner Production*	GOLD	76
Araujo Galvão et al.	2020	Towards a value stream perspective of circular business models	*Resources, Conservation and Recycling*	GOLD	25
Betancourt Morales and Zartha Sossa	2020	Circular economy in Latin America: A systematic literature review	*Business Strategy and the Environment*	GOLD	42
Borrello et al.	2020	Consumers are willing to participate in circular business models: A practice theory perspective to food provisioning	*Journal of Cleaner Production*	GOLD	41
Camilleri	2020	European environment policy for the circular economy: Implications for business and industry stakeholders	*Sustainable Development*	SILVER	59
Centobelli et al.	2020	Designing business models in circular economy: A systematic literature review and research agenda	*Business Strategy and the Environment*	GOLD	31
Chen et al.	2020	Implementation of green chemistry principles in circular economy system towards sustainable development goals: Challenges and perspectives	*Science of the Total Environment*	SILVER	146
da Costa Fernandes et al.	2020	Towards product-service system oriented to circular economy: A systematic review of value proposition design approaches	*Journal of Cleaner Production*	GOLD	95
Dantas et al.	2020	How the combination of Circular Economy and Industry 4.0 can contribute towards achieving the sustainable development goals	*Sustainable Production and Consumption*	SILVER	182
Donner et al.	2020	A new circular business model typology for creating value from agro-waste	*Science of the Total Environment*	SILVER	109
Fritz Benachio et al.	2020	Circular economy in the construction industry: A systematic literature review	*Journal of Cleaner Production*	GOLD	184
Gallego-Schmid et al.	2020	Links between circular economy and climate change mitigation in the built environment	*Journal of Cleaner Production*	GOLD	88
Geissdoerfer et al.	2020	Circular business models: A review	*Journal of Cleaner Production*	GOLD	171

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Goyal et al.	2020	Circular economy research: A bibliometric analysis (2000–2019) and future research insights	*Journal of Cleaner Production*	GOLD	55
Guldmann and Huulgaard	2020	Barriers to circular business model innovation: A multiple-case study	*Journal of Cleaner Production*	GOLD	133
Harris et al.	2020	Circularity for circularity's sake? Scoping review of assessment methods for environmental performance in the circular economy	*Sustainable Production and Consumption*	SILVER	127
Henry et al.	2020	The battle of the buzzwords: A comparative review of the circular economy and the sharing economy concepts	*Environmental Innovation and Societal Transitions*	GOLD	47
Hossain et al.	2020	Circular economy and the construction industry: Existing trends, challenges and prospective framework for sustainable construction	*Renewable and Sustainable Energy Reviews*	GOLD	122
Jia et al.	2020	The circular economy in the textile and apparel industry: A systematic literature review	*Journal of Cleaner Production*	GOLD	197
Lahane et al.	2020	Circular supply chain management: A state-of-art review and future opportunities	*Journal of Cleaner Production*	GOLD	132
Lybæk et al.	2020	Enhancing policies for deployment of Industrial symbiosis—What are the obstacles, drivers and future way forward?	*Journal of Cleaner Production*	GOLD	25
Mhatre et al.	2020	A systematic literature review on the circular economy initiatives in the European Union	*Sustainable Production and Consumption*	SILVER	102
Moktadir et al.	2020	Critical success factors for a circular economy: Implications for business strategy and the environment	*Business Strategy and the Environment*	GOLD	102
Munaro et al.	2020	Towards circular and more sustainable buildings: A systematic literature review on the circular economy in the built environment	*Journal of Cleaner Production*	GOLD	117
Palmie et al.	2020	Circular business model implementation: Design choices, orchestration strategies, and transition pathways for resource-sharing solutions	*Journal of Cleaner Production*	GOLD	27
Puntillo et al.	2020	Reevaluating waste as a resource under a circular economy approach from a system perspective: Findings from a case study	*Business Strategy and the Environment*	GOLD	16
Rajput and Singh	2020	Industry 4.0 Model for circular economy and cleaner production	*Journal of Cleaner Production*	GOLD	67
Rovanto and Bask	2020	Systemic circular business model application at the company, supply chain and society levels—A view into circular economy native and adopter companies	*Business Strategy and the Environment*	GOLD	32
Salvador et al.	2020	Key aspects for designing business models for a circular bioeconomy	*Journal of Cleaner Production*	GOLD	50

(Continues)

TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Sarja et al.	2020	A systematic literature review of the transition to the circular economy in business organizations: Obstacles, catalysts and ambivalences	*Journal of Cleaner Production*	GOLD	44
Sassanelli et al.	2020	Addressing circular economy through design for X approaches: A systematic literature review	*Computers in Industry*	SILVER	63
Schöggl et al.	2020	The narrative of sustainability and circular economy—A longitudinal review of two decades of research	*Resources, Conservation and Recycling*	GOLD	209
Turken and Geda	2020	Supply chain implications of industrial symbiosis: A review and avenues for future research	*Resources, Conservation and Recycling*	GOLD	29
van Loon et al.	2020	Circular products and business models and environmental impact reductions: Current knowledge and knowledge gaps	*Journal of Cleaner Production*	GOLD	32
Vegter et al.	2020	Supply chains in circular business models: processes and performance objectives	*Resources, Conservation and Recycling*	GOLD	48
Bertolucci Paes et al.	2019	Organic solid waste management in a circular economy perspective—A systematic review and SWOT analysis	*Journal of Cleaner Production*	GOLD	102
Butturi et al.	2019	Renewable energy in eco-industrial parks and urban-industrial symbiosis: A literature review and a conceptual synthesis	*Applied Energy*	GOLD	91
Chiappetta Jabbour et al.	2019	Who is in charge? A review and a research agenda on the 'human side' of the circular economy	*Journal of Cleaner Production*	GOLD	187
Kristensen and Mosgaard	2019	A review of micro level indicators for a circular economy—moving away from the three dimensions of sustainability?	*Journal of Cleaner Production*	GOLD	269
Lin Ngan et al.	2019	Prioritization of sustainability indicators for promoting the circular economy: The case of developing countries	*Renewable and Sustainable Energy Reviews*	GOLD	88
Marrucci et al.	2019	The integration of circular economy with sustainable consumption and production tools: Systematic review and future research agenda	*Journal of Cleaner Production*	GOLD	67
Parida et al.	2019	Orchestrating industrial ecosystem in circular economy: A two-stage transformation model for large manufacturing companies	*Journal of Business Research*	GOLD	146
Parida and Wincent	2019	Why and how to compete through sustainability: a review and outline of trends influencing firm and network-level transformation	*International Entrepreneurship and Management Journal*	SILVER	61
Pieroni et al.	2019	Business model innovation for circular economy and sustainability: A review of approaches	*Journal of Cleaner Production*	GOLD	418
Prieto-Sandoval et al.	2019	Key strategies, resources, and capabilities for implementing circular economy in industrial small and medium enterprises	*Corporate Social Responsibility and Environmental Management*	GOLD	99

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TABLE A1 | (Continued)

Author(s)	Year	Title	Journal	AiIG rank	# Scopus citations
Rosa et al.	2019	Assessing relations between Circular Economy and Industry 4.0: a systematic literature review	*International Journal of Production Research*	GOLD	259
Rosa et al.	2019	Circular Business Models versus circular benefits: An assessment in the waste from Electrical and Electronic Equipments sector	*Journal of Cleaner Production*	GOLD	72
Rosa et al.	2019	Towards Circular Business Models: A systematic literature review on classification frameworks and archetypes	*Journal of Cleaner Production*	GOLD	159
Salvador et al.	2019	Circular business models: Current aspects that influence implementation and unaddressed subjects	*Journal of Cleaner Production*	GOLD	55
Sassanelli et al.	2019	Circular economy performance assessment methods: A systematic literature review	*Journal of Cleaner Production*	GOLD	274
Suàrez-Eiroa et al.	2019	Operational principles of circular economy for sustainable development: Linking theory and practice	*Journal of Cleaner Production*	GOLD	226
Walmsley et al.	2019	Circular Integration of processes, industries, and economies	*Renewable and Sustainable Energy Reviews*	GOLD	86
Frishammar and Parida	2018	Circular Business Model Transformation: A Roadmap for Incumbent fIrms	*California Management Review*	GOLD	126
Geissdoerfer et al.	2018	Sustainable business model innovation: A review	*Journal of Cleaner Production*	GOLD	477
Homrich et al.	2018	The circular economy umbrella: Trends and gaps on integrating pathways	*Journal of Cleaner Production*	GOLD	375
Luedeke-Freund et al.	2018	A Review and Typology of Circular Economy Business Model Patterns	*Journal of Industrial Ecology*	SILVER	414
Mortensen and Kørnøv	2018	Critical factors for industrial symbiosis emergence process	*Journal of Cleaner Production*	GOLD	59
Ormazabal et al.	2018	Circular Economy in Spanish SMEs: Challenges and opportunities	*Journal of Cleaner Production*	GOLD	242
Saidani et al.	2018	A taxonomy of circular economy indicators	*Journal of Cleaner Production*	GOLD	398
Sousa-Zomer et al.	2018	Exploring the challenges for circular business implementation in manufacturing companies: An empirical investigation of a pay-per-use service provider	*Resources, Conservation and Recycling*	GOLD	98
Stewart and Niero	2018	Circular economy in corporate sustainability strategies: A review of corporate sustainability reports in the fast-moving consumer goods sector	*Business Strategy and the Environment*	GOLD	155
Türkeli et al.	2018	Circular economy scientific knowledge in the European Union and China: A bibliometric, network and survey analysis (2006e2016)	*Journal of Cleaner Production*	GOLD	91
Zhu et al.	2018	Efforts for a Circular Economy in China: A comprehensive review of policies	*Journal of Industrial Ecology*	SILVER	91

TABLE A2 | Keywords thesaurus.

Keyword	Synonyms	References
Circular business model	Circular economy model, closed-loop business model, regenerative business model, zero-waste business model, cradle-to-cradle, recycle business model	Geissdoerfer et al. 2020; Ritala et al. 2018
Transformation	Transition, redefinition, re-alignment, shift	Frishammar and Parida 2019; Van Loon et al. 2022
Business strategy	Vision, profitable business model, strategic planning	Van Opstal and Borms 2023; Moktadir et al. 2020
Business model	Value proposition, value creation, value delivery, value capture, competitive plan	Rosa et al. 2019
Industrial symbiosis	Eco-industrial park, energy synergy network, industrial synergy, industrial districts	Butturi et al. 2019
Circular economy	Sustainable development, closed-loop economy, regenerative economy, zero-waste economy, sustainable economy	De Oliveira and Olivera 2023; Geissdoerfer et al. 2017
Sustainability	Sustainable development, circularity, environmental sustainability	Stewart and Niero 2018