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REVIEW PAPER

Circular Business Models in Retail and Manufacturing: Mechanisms, Drivers, and Barriers

Joseph Kimaro[1] · Virginie Litaudon[2] · Danni Zhang[3] · Regina Frei[4]

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Abstract
The retail sector and its associated supply chains are characterised by inefficiencies that result in substantial waste, driven by practices such as overproduction, overstocking, and high rates of product returns. To address these sustainability challenges, Circular Business Models (CBMs) offer an alternative to the traditional linear economy by extending product lifecycles and minimising waste. Despite their conceptual appeal, CBMs remain marginal in mainstream retail and are often adopted superficially, serving reputational goals rather than driving systemic change. This study presents a systematic literature review (SLR) of 90 peer-reviewed articles selected from an initial sample of 353 retrieved from the Scopus database, spanning a range of industries including fashion, electronics, automotive, and construction. We identify seven core mechanisms enabling circularity (e.g., R-strategies, eco-design, product stewardship), five primary drivers (such as regulatory pressure and value creation), and seven categories of barriers (ranging from consumer resistance to financial and policy constraints). By synthesising interdisciplinary literature across retail and manufacturing, this review provides actionable insights for firms seeking to operationalise CBMs and offers policy recommendations to accelerate the transition toward a circular economy.

Keywords Circular economy · Circular business models · Retail · Manufacturing · Drivers · Barriers

✉ Joseph Kimaro
j.kimaro@exeter.ac.uk

Regina Frei
r.frei@arts.ac.uk

1 Business School, University of Exeter, Penryn, UK

2 Business School, University of Portsmouth, Portsmouth, UK

3 Business School, Cardiff University, Cardiff, UK

4 Fashion, Textiles and Technology Institute, University of the Arts London, London, UK

ntroduction

The Circular Economy (CE) has emerged as a response to the shortcomings of unsustainable production and consumption, challenging the traditional linear model of "take-make-consume-discard" [25]. It represents an economic system where value is generated by repeatedly reusing resources, with a focus on closing and slowing down resource cycles throughout the entire product lifespan, ranging from resource extraction to end-of-life considerations [20, 78]. To implement the CE, scholars agree that companies need to create Circular Business Models (CBMs) [44, 58, 72, 75, 142]. CBMs aim to maximise the value of a product and its components by employing multiple resource cycles and minimising waste and consumption [66, 78, 111]. These models thus seek to achieve economic, environmental, or social objectives [48], creating a tension between achieving circularity and creating economic value [34]. Many companies struggle with this complex endeavour, and a deeper understanding of why companies adopt CBM, how CMB are implemented, and the challenges to overcome may help. This study will provide insight into these aspects on the basis of a Systematic Literature Review (SLR).

According to the [95], the typology of CBMs differs between five types: Circular supply; Resource recovery; Product life extension; Sharing models; and Product service systems. These elements can also be combined, e.g. where a company makes aircraft engines from recycled materials, sells engine hours to various airlines, uses maintenance and overhaul proactively to extend engine life, and recovers the products for component reuse and recycling.

On a more abstract level, CBMs are based on four generic strategies: (1) cycling; (2) extending; (3) intensifying; and (4) dematerialising. These are the elements of the CBM definition that Geissdoerfer et al. (2020) synthesised from their analysis of the literature: "circular business models can be defined as business models that are cycling, extending, intensifying, and/or dematerialising material and energy loops to reduce the resource inputs into and the waste and emission leakage out of an organisational system. This comprises recycling measures (cycling), use phase extensions (extending), a more intense use phase (intensifying), and the substitution of products by service and software solutions (dematerialising)."

The transition to a CBM inevitably involves significant complexity, partly governed by context. For example, the evolution to circularity in the retail sector requires approaches to manufacturing, consumption, and ownership transitioning together [59]. In addition, businesses identified as circular often operate in niche markets initially and then may grow slowly; scalability remains a challenge [68]. When large companies adopt circular practices in retail and manufacturing, they typically do it through small-scale pilot projects set up to enhance their image. This leads some industry commentators to accuse companies of greenwashing to enhance their image with stakeholders [6]. Some CBM implementations eventually fail due to regulatory, cultural, economic or technological reasons [14]. A better understanding of why and how companies implement CBMs, as well as the challenges they need to overcome, can support more successful, comprehensive and larger-scale implementations.

This study seeks to assess the opportunities and challenges of adopting CBM in various sectors that sell products to consumers. As CBM adoption typically requires a rethinking of the way products are made, sold, and brought back, we focus on retail and associated manufacturing. We conducted our SLR following the methodology of [40], with a focus on identifying drivers and barriers to implementation as well as ways to achieve circularity. Our synthesis can guide researchers and practitioners in understanding how CBM can be implemented and serves to inform policymakers in how to facilitate CBM implementation.

Rationale of the Study

We present a distinctive literature review by focusing on retail and associated manufacturing sectors, encompassing a variety of products and services that have previously been overlooked in product-specific studies of CBMs. In particular, some CBM literature reviews concentrate on specific industries such as food [38] or fashion [42]. Previous reviews have often focused on *highly specific aspects such as* sustainable servitisation [140], CBM archetypes [136], or scalability strategies [68], while other reviews focus on *specific elements* such as digitalisation [26, 135], CBM adoption determinants [8], responsible innovation and ethical behaviour [42], and environmental assessments [133]. Another distinctive feature of previous reviews is the adoption of a *geographic lens*; for instance, examining the implementation of circular practices in the EU [87].

To ensure inclusivity, our review focuses on business models, as circular practices can occur independently of CBMs, while adopting CBMs often facilitates the structured implementation of circularity in manufacturing. [19].

Table 1 compares existing related literature reviews and their contributions, identifies knowledge gaps, and – in the last column of the table – details how our study contributes to the state of the art by building on the existing work and addressing the identified lacunae.

Individual studies explore the drivers and barriers of CBM innovation [56] or –more specifically – the barriers to circular start-ups [12]. However, there is currently no SLR on this topic. In their SLR, [29] studied how CBMs are designed on a *conceptual level* to achieve value creation, capture, and transfer. [64] explored the relationship between CBM and the three dimensions of sustainability. Finally, [49] conducted a bibliometric analysis on CE and CBM, highlighting emergent topics such as management and control, competitive advantage, and consumer behaviour.

Our review contributes to the state of the art by providing a wider view of CBMs in the retail and manufacturing industry, which includes various sectors such as fashion and beauty, furniture, sports and leisure equipment, electronics and appliances, automotive, and building and construction. We excluded the food and beverage sector, as it often operates under very different conditions than the other sectors. Our research aim is to provide a deeper understanding of how CBMs in retail and associated manufacturing are implemented. In particular, we identified the mechanisms companies use to create circularity (that is, the ways in which they create the circularity), why they do it, and the barriers they need to overcome. We synthesised our findings to provide guidance to researchers, practitioners and policymakers in understanding CBM adoption. To achieve these objectives, our research questions (RQ) are:

RQ1: What are the mechanisms businesses use to implement a CBM?

RQ2: What are the drivers for businesses to adopt a CBM?

RQ3: What are the barriers to CBM implementation?

A key managerial implication is that a deeper understanding of these elements will facilitate a wider-spread and more systemic CBM adoption by businesses. This may then lead to

Table 1 Comparison with existing literature reviews on circular business models

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[135]	J. of Cleaner Production (hereafter 'JCP')	SLR	Sustainable omnichannel retailing through digitalisation	99	Provided insights on sustainable omnichannel retailing through digitalisation. However, interactions between retail and manufacturing not explored.	We extend the analysis by incorporating the interdependence between retail and manufacturing through the lens of CBMs.
[38]	J. of Hygienic Engineering and Design	Informal review	Food industry	unclear	Offered a focused, industry-specific review on food production and processing in the context of sustainability.	Our scope is on retail and manufacturing of consumer goods, excluding the food and beverage sectors.
[42]	Asia Pacific J. of Management	SLR	Fashion; responsible innovation and ethical behaviour	114	Highlighted responsible innovation and ethical behaviour in the Asian fashion industry but lacked a broader cross-sectoral and geographic scope.	While their work contributes to understanding CE in Asian fashion, we extend it by examining CBM adoption across multiple sectors and regions.
[19]	JCP	SLR	Manufacturing	80	Mapped success cases of circular initiatives in manufacturing, yet did not delve into barriers or broader cross-sector challenges.	Building on their identification of success cases, we add value by exploring common barriers and challenges in CBM adoption across sectors.

Table 1 (continued)

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[140]	JCP	SLR using a machine learning tool	Sustainable servitisation	66	Advanced methodology by incorporating machine learning to review sustainable servitisation, but limited the thematic scope to this.	Complementing their machine-learning-based review of servitisation, we broaden the thematic scope to encompass various CBM types and sectoral contexts.
[136]	European Conf. on Innovation and Entrepreneurship	SLR	CBM archetypes	76	Contributed a classification of CBM archetypes yet offered limited insight into mechanisms driving their adoption.	Building on their CBM archetype classification, we focus on uncovering practical mechanisms that drive CBM adoption across contexts.
[68]	Sustainable Production & Consumption	SLR	Scalability strategies	57	Proposed scalability strategies for CBMs but lacked a focus on actionable or practical implementation mechanisms.	We expand on their discussion of scalability strategies by identifying specific mechanisms that support CBM scaling in practice.
[26]	Int. J. Productivity and Performance Management	Bibliometrics	Digitalisation driver	169	Identified digitalisation as a key driver of CBMs through bibliometric analysis but did not integrate broader contextual or operational factors.	Extending their focus on digitalisation, we provide a more comprehensive view by integrating additional drivers and barriers to CBM adoption.

Table 1 (continued)

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[8]	Business Strategy and the Environment	SLR	CBM adoption determinants	67	Investigated adoption determinants across various sectors, but lacked focused attention on barriers and enabling mechanisms.	We build on their work by analysing barriers and mechanisms specific to retail and manufacturing.
[133]	JCP	SLR	Environmental assessments	54	Assessed environmental impacts of CBMs, contributing to sustainability measurement. However, it did not incorporate economic or social dimensions.	Complementing their environmental assessment focus, we adopt a multidimensional view of CE, including economic and social factors.
[87]	Sustainable Production and Consumption	SLR	Adoption of circular practices within certain geographic regions	151	Explored drivers for CE adoption in specific regions (mainly EU) but did not examine barriers or broader geographical contexts.	Expanding their EU-focused review of CE drivers, we explore both drivers and barriers in diverse global and sectoral contexts.
[16]	Lecture Notes in Mechanical Engineering	SLR	Opportunities and Challenges of Mass Customization for CE	15	Investigated the intersection of mass customisation and CE yet did not address other critical dimensions or sectors.	While they explore mass customisation and CE, we provide a broader review that captures other sectoral innovations and CBM adoption mechanisms.

Table 1 (continued)

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[114]	Procedia CIRP	SLR	The interdependencies between the circular product design (CPD) and CBM	64	Linked CPD and CBMs with a focus on digital and economic aspects, while overlooking social and regulatory interdependencies.	Building on their work on CPD-CBM interdependencies, we provide a more integrated, multidimensional view of circularity, incorporating social, regulatory, and operational elements.
[105]	Procedia CIRP	SLR	CSFs for digitalisation of collaborative circular business models	64	Identified success factors for digitalising collaborative CBMs but did not address the influence of regulatory and policy environments.	Addressing their limited policy coverage, we incorporate policy drivers and regulatory influences at multiple governance levels.
[51]	JCP	SLR	Focus on mapping potential rebound effects of circular economy strategies	68	Mapped potential rebound effects of CE strategies, contributing to unintended consequence analysis; however, it lacked practical, sector-level implications.	We complement their work by providing sector-specific insights into how CBMs can be practically implemented.
[97]	Studies in Business and Economics,	Bibliometric analysis	Intersection of business model innovation, sustainability, and digitalization	1,195	Offered a broad bibliometric overview at the intersection of business model innovation and sustainability but lacked a nuanced exploration of regulatory enablers and firm-level dynamics.	Extending their broad bibliometric mapping, we explore regulatory enablers and barriers at local, national, and international levels.

Table 1 (continued)

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[62]	IEIM 2024 proceedings	SLR	Supporting manufacturing SMEs in industrialized countries to select appropriate CBMs	74	Focused on CBM selection for manufacturing SMEs in industrialised countries, contributing to SME-level understanding, but ignored other sectors and country contexts.	We expand the analysis to compare CBM adoption in both retail and manufacturing contexts.
[33]	Sustainable Production and Consumption	SLR-grey literature	Barriers hindering the transition to a Circular Bio-Based Economy across four carbon-intensive industrial sectors	198	Highlighted barriers in circular bio-based transitions using grey literature across carbon-intensive sectors yet excluded peer-reviewed insights and broader CE dynamics.	Addressing their exclusive reliance on grey literature and focus on barriers, we contribute a peer-reviewed perspective and also explore CBM drivers.
Bjørnbet et al., [18]	Sustainable Business Models in the Circular Economy	SLR	Examines how life cycle assessment (LCA) supports circular business model development	19	Emphasised the role of LCA in CBM development, advancing environmental integration. However, it was narrowly focused on environmental assessment.	While they focus on environmental assessments via LCA, we offer a broader approach by examining CBM adoption through economic, policy, and operational lenses.

Table 1 (continued)

Authors, year	Journal	Method	Focus	# reviewed papers	Key findings and Gap	Our contribution
[9]	Sustainable Development	SLR	Offer a conceptual understanding of how I4.0 and CE jointly pave the way for I5.0's broader societal goals.	160	Provided a conceptual link between Industry 4.0, CE, and Industry 5.0, yet did not examine practical firm-level strategies for circularity implementation.	Building on their conceptual linkage of I4.0, CE, and I5.0, we address the practical gap by identifying firm-level mechanisms and challenges for CBM implementation.

the formation of CE ecosystems, where companies collaborate and form synergies in their CBM implementations [74].

The remainder of this paper is organised as follows: After discussing the literature review methodology, the findings are presented in three sections: first, the mechanisms for CBM implementation, second, the drivers, and third, the barriers. We conclude the paper by summarising our findings and implications, recognising limitations, and identifying fruitful avenues for future research.

Methodology

This study was conducted using the SLR methodology by [40]. An SLR is more rigorous and transparent than a narrative traditional literature review [127], and the fundamental principles of a systematic review in the management and organisation field are being transparent, inclusive, explanatory and heuristic. To apply these principles, researchers are recommended to take the following steps: locating studies, selecting and evaluating studies, analysing and synthesising, and finally reporting results [40]. We subsequently describe our implementation of this process.

Study Identification, Screening, and Selection Process

By examining publications from diverse journals and subject areas, we aimed to cast a wide net, considering the interdisciplinary nature of the CBM field. We deliberately chose to omit a study timeframe and incorporated all papers available. Aiming to cast the net wide, the following search was conducted in the Scopus database in April 2025: TITLE-ABS-KEY ("circular business model" OR "sustainable business model" AND "retail" OR "manufacturing"). As a result, a total of 353 papers were gathered from different academic fields as CBMs are built upon various knowledge sources such as business, ecology, economy, and social science [48]. We did not conduct a backwards search. Each paper was viewed as a unit of analysis. This selection strategy allowed us to thoroughly explore the multifaceted landscape of CBM research, unveiling a range of perspectives and insights. Such an inclusive methodology offered insights into the evolving trends, challenges, and opportunities shaping CBMs in retail and manufacturing.

At screening level 1 (depicted in Fig. 1), we evaluated the abstracts of the 353 gathered papers, leading us to select 145 papers. We excluded articles that did not explicitly address CBMs with their drivers, barriers and implementations, and we omitted editorials for special issues as well as literature reviews (which we added to Table 1 instead). Furthermore, to ensure the inclusion of high-quality and rigorously peer-reviewed studies, we excluded articles from journals that have been subject to academic scrutiny practices e.g. journals from publishers such as MDPI, or journals such as Frontiers in Sustainability, Heliyon [99, 116]. This ensures a focused inclusion of studies that directly contribute to the research objectives, enabling us to concentrate on sources that provide insightful analyses and empirical observations crucial to unravelling the dynamics of CBMs. The selected 90 papers are listed in Appendix 1.

Analysis and Synthetising

Following the initial screening phase, we proceeded to the more detailed analysis required for screening level 2. We extensively examined 145 selected papers to determine the key factors that either support or hinder the implementation of CBMs in the retail and associated manufacturing sectors. We collected data such as industry, product, type of circularity each

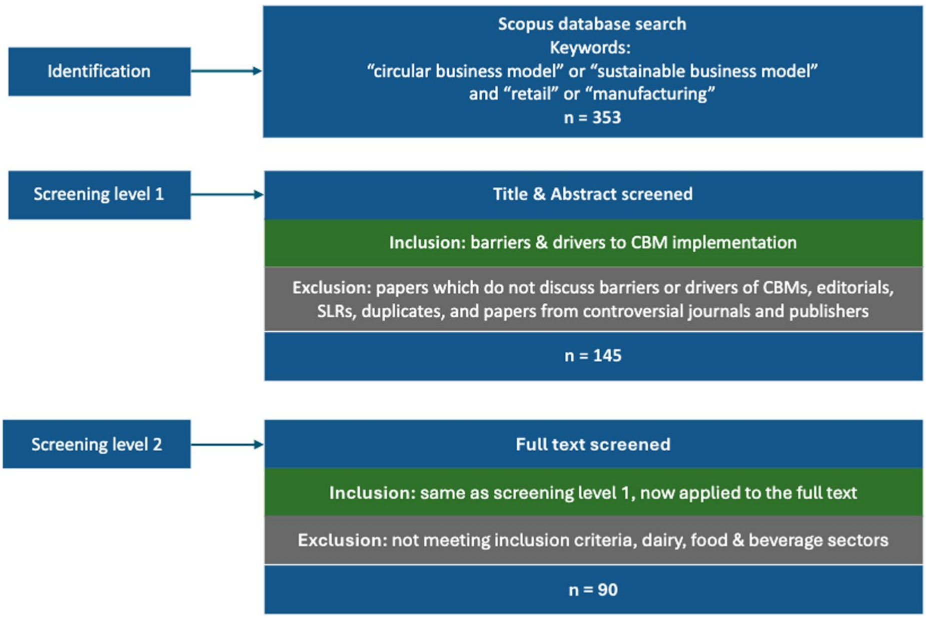
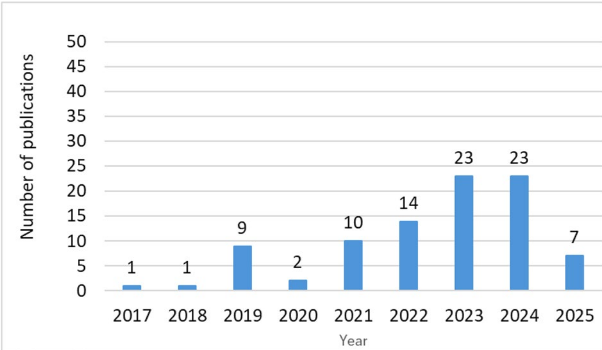


Fig. 1 Article identification and screening procedure employed in this SLR

paper assessed, and the research methodologies employed. We analysed recurring themes, similarities, and differences within the research literature related to CBMs in the retail and associated manufacturing sectors. During the evaluation of the 145 studies, we excluded those that did not discuss the drivers or barriers to CBMs and papers that focused on the dairy, food, and beverage sectors.

This led to a final selection of 90 relevant papers after the level 2 screening. All selected papers were published between 2017 and early 2025, with their distribution illustrated in Fig. 2. The majority of articles were published in *Business Strategy and Environment* and the *Journal of Cleaner Production*, as detailed in Fig. 3.

Fig. 2 Publications by year



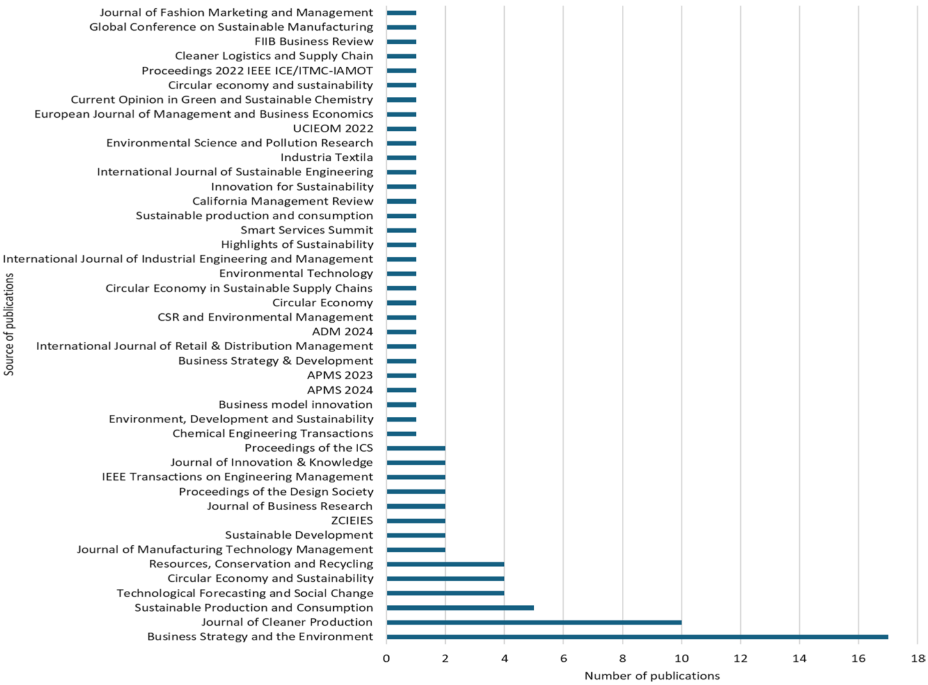


Fig. 3 Publications by journals

Analysis based on the Research Focus Area

We systematically categorised and analysed the selected paper based on the specific industrial focus and the research techniques, with details in Table 2. The research encompassed four distinct industrial domains: (i) apparel and fashion, (ii) electronics and household appliances, (iii) automotive retail, and (iv) building and construction. We also find that most studies did not focus on a particular industry. The multifaceted exploration approach highlighted the growing recognition of interindustry dynamics in pursuing circularity. The most popular industries featured were studies on apparel and fashion, closely followed by electronics. This reflects a heightened scholarly interest in investigating sustainability and implementing CE principles within consumer-driven industries. Meanwhile, automotive retail and building and construction, though less emphasised, continue to be essential domains for exploring circular practices within their respective niches. Table 3 reveals a field dominated by case studies and conceptual work, with limited generalisability. A move toward mixed methods indicates growing methodological balance, but further diversification is needed.

Table 2 Categorisation of studies according to industry focus

Industry focus	Definition	Number of articles by Industry	Type of circularity
Apparel and Fashion	clothing, footwear, sporting apparel and fashion accessories.	18	Demand-led production, life-extending strategies, PSS, designing for longevity, deceleration of fashion business practice, leasing, reuse, recycling, material and waste reduction, recycled materials, upcycling fibres, redistribute, repair, swap, donation, sustainable sourcing/certified sourcing, local sourcing, maintenance, remanufacturing and refurbishment
Electronics and household Appliances	smartphones, computers, water filtration, and home entertainment.	9	PSS, extending life cycle of products, leasing, remanufacturing, recycling, reuse, repair, refurbishment, elimination of waste, use of renewable energy
Automotive Retail	auto Parts and accessories	4	Recycled resources, non-generation of waste, PSS, remanufacturing, refurbishment, recycling, reverse logistics, repair, repurposing
Building and Construction	ceramic tiles	4	Recycling, recyclable materials, eco-design, sharing, industrial symbiosis
Multifaceted exploration	exploring more than one Industry, such as construction materials, automotive, electronics, and apparel, among others.	55	Recycling, Sustainable energy methods/Energy efficiency. Refurbishments Biodegradable materials Repair, Reuse, Circular product innovation, Circular production, Remanufacturing Reduce, Resource efficiency/recovery, PSS/Performance-based model Lifecycle extension, Employee engagement and improving workplace conditions, Design for end of life, Sustainable materials Waste reduction, logistic optimisation, eco-design, Repurposing

Table 3 Overview of methodologies adopted in the selected articles

Research technique	Number of articles by research method
Case study	22
Survey	16
Interview	11
Mixed method	12
Modelling/simulation	9
Document analysis and review	5
Theoretical and conceptual	13
Experiment	2
Total	**90**

Case studies were by far the most frequently employed research methodology, reflecting the significance of grounding research in real-world contexts to fully grasp the intricacies of CBMs. Particularly in multifaceted exploration studies, researchers adopted mixed-method approaches, combining case studies, surveys, and interviews. This offered opportunities for comprehensive analysis of how circularity concepts transcend individual industries and foster opportunities for cross-sectoral collaboration.

When analysing circularity in different sectors, we observed distinct patterns and similarities. Recycling and using recyclable and recycled materials are common threads weaving through multiple industries, underscoring a universal emphasis on waste reduction and resource optimisation. The apparel and fashion industry emphasises demand-led production and life-extending strategies to address concerns regarding consumption pace and waste generation [10, 43, 102]. Strategies such as prioritising longevity in design, slowing down fashion business practices, swapping, donating and integrating sustainable sourcing [10, 22, 43, 83, 102, 112, 125] address the fashion industry's distinct characteristics of rapid trend changes and the related environmental consequences.

Similarly, the electronics and household appliances industry places significant emphasis on prolonging the lifespan of its products. This is demonstrated by the implementation of strategies such as repair, remanufacturing, refurbishment, and leasing models [70, 91, 134], which reflect the industry's struggle with rapid technological obsolescence and the electronic waste.

The automotive retail industry focuses on recycling and waste reduction [50], as well as extending the lifespan of products through refurbishment and Product Service Systems [4, 50, 77, 98, 115]. Reverse logistics and repurposing [50] emphasise the industry's attention to the systemic flow of materials and components.

The building and construction sector emphasises eco-design, sharing, recycling, and industrial symbiosis to promote sustainable design practices and collaborative resource optimisation [65]. This is particularly important in an industry with high material consumption and waste.

Our findings suggest that each industry implements individual circularity strategies that address its unique challenges and opportunities. However, there are also common themes *across industries*, such as sustainable energy [130], resource efficiency [11, 54, 61], recycling practices [28, 123] and employee engagement [23, 88].

In the next section, we delve deeper into how circularity and sustainability are achieved and classify the mechanisms into different categories depending on their nature and focus.

Mechanisms to Achieve Circularity in Retail and Manufacturing

The first question we asked when conducting the SLR was: "How is circularity achieved in these business models?" In response, we identified seven categories of elements, strategies, sets of actions, enablers or technical solutions that contribute to circularity in the retail and manufacturing industry, and we decided to call them 'mechanisms':

1. Digitalisation;
2. "R strategies" like refuse, reduce, reuse, repair, resell, remanufacture, refurbish, refresh, recondition, recycle, revalorise, redesign, rethink etc.;
3. Eco-design;
4. Product stewardship;
5. Sustainable materials;
6. Sustainable operations; and.
7. Social aspects.

Some of them, such as sustainable operations, are also established stand-alone concepts, yet their implementation often contributes to CBMs. For instance, rainwater may be collected from the roof of a building for flushing toilets. To enable a more thorough transition to circularity, systems thinking, or adopting a systemic perspective, is essential [71, 131]: understanding the dynamics between processes, values and actors in the value chain, and their dependence on cultural, spatial and temporal characteristics.

[123] identified three types of CE implementation: one focused on design, which we refer to as *eco-design*; one on take-back management, here labelled as reverse logistics and included under *sustainable operations*; and one on recycling – the most frequent type – which we include as an "*R strategies*." We included additional categories – namely, *product stewardship*, *sustainable materials*, and *social aspects* – to represent the diversity of strategies being used in practice.

Subsequently, we review how circularity mechanisms are reviewed in the CBM literature, following the seven identified categories.

Digitalisation

Digital technology is an enabler for many of the mechanisms and business models in retail and manufacturing [96], as is artificial intelligence [108]. Indeed, digitalisation often plays such an important role in the transition to circularity that the process is called Twin Transition [21]. [27] identified three types of digital technologies: base digital technologies that support business-as-usual circular economy; integrative digital technologies, which are relevant to less adopted circular economy practices; and catalyser digital technologies that are enablers for practices associated with both business-as-usual and circular business model innovation. Similarly, funding can be an enabler for CBM implementation (and a lack of funding pose a significant barrier). [138] identify a variety of funding models for supporting circularity and its systemic nature [37].

"R strategies" and Related Mechanisms

Most publications in this category focus on the prevalent circular strategies, which include reusing, recycling, remanufacturing or refurbishing, and repairing, and extending lifecycles (e.g. [82, 137]. Only a few articles mentioned other strategies, which are specific to the retail context, such as renting/leasing, redistribution, repurposing, sharing and swapping or donation [4, 43, 68, 125, 134]. For instance, [4] described the repurposing of lithium-ion batteries as a complex and diverse process extending beyond simple reuse. It involves disassembling and reassembling battery modules, integrating new components, and collaborating with manufacturers, service providers, and suppliers. This approach transforms batteries for new applications, primarily in energy storage, creatively extending their functionality beyond their original purpose.

When presenting their value proposition to consumers, retailers need to be aware that recirculated products (having undergone an R process) typically compete against new products rather than used ones [70]. Reverse logistics and reverse supply chains need to be established to enable the implementation of R strategies [85].

At their core, most R strategies focus on identifying, creating, delivering and conserving value [36]. However, an often-neglected aspect is that most R processes produce some leftovers, and solutions for these are needed. [141] present a business model for dealing with "plasmix", the non-homogeneous and unrecyclable residual blend from plastic recycling processes.

[88] explored the potential of digital intelligence and redistributed manufacturing (RDM) as an enabler for CBM. RDM is a form of local, small-scale manufacturing that utilises advanced technologies, such as additive manufacturing, in combination with circular practices, such as take-back schemes and asset tracking. RDM requires collaborations between manufacturers, retailers and consumers. Case studies demonstrate varying impacts on supply chains, material flows, and economic viability of CBMs. [80] shows how revalorising waste materials can create business opportunities for small companies feeding into the supply chains of large companies. Similarly, [52] discuss how a CBM for remanufacturing in the local appliance industry can be scaled up. Integrating external post-consumer waste into its production cycle enabled resource efficiency, cost savings, and regional revitalization [47].

Eco-Design

Although it is essential to design products for sustainability and circularity, reducing their environmental impact, the design principles are often not explicitly labelled as eco-design or design for circularity [103]. In some cases, other labels are used, such as design for disassembly or design for repairability, which also belong to and significantly contribute to CE design principles.

[10] detailed the various phases of the design procedure for a multifunctional leisure sports garment intended to make both jackets and backpacks. Their case study demonstrated the significance of the design phase in emphasising reuse, maintenance, and recycling when developing products with an extended lifespan. [43] argued that fashion designers must be trained to select materials and chemicals with the lowest environmental impact, and which

are both recycled and recyclable. Decision support methods and tools are needed for circular and sustainable product development [103].

Circular product innovation should go hand in hand with circular process innovation. Eco-design as an approach helps put this into practice, and in combination with digitalisation, can allow designers and engineers to explore the sustainability and performance of different options, such as 3D printing to rethink manufacturing [132].

Designing for circularity often means rethinking fundamentally how things are done, how items are made, how products or services are sold, how consumers use them, and what happens afterwards. [102] p.298) stated that "working within the constraints of mono-materiality, biological circularity, and zero-waste, designers focused on product longevity are developing new design processes guided by circular purpose." The latter includes considerations for end-of-life solutions, such as design for (cost-effective) disassembly or dismantling [129].

Product Stewardship

The terms "extended producer responsibility" or "product stewardship" refer to the concept that manufacturers must remain responsible for the products they produce throughout their entire life cycle, including an end-of-life or back-to-the-cradle solution, as typically adopted in product service systems, servitisation models, and product as a service approaches [24, 76, 89]. The concept also has implications on how items (or the services they provide) are sold to consumers. [2] identified strategies like "extending product value" and "extending resource value" as effective and applicable to a variety of industries. [3] identified 'circular infrastructure' and resource optimisation to be crucial antecedents for CBM implementation. [84] discuss an equivalent concept for extending manufacturing machine lifecycles as part of the transition to circularity, whereas [7] analyse under which conditions servitisation is viable for manufacturing equipment and machinery. This aligns with the idea of slowing consumption in fashion retail by building sewing capabilities – for instance, clothing repair workshops at retail stores – to facilitate product life extension [22]. Fashion brands taking control of the second-hand markets can take various forms [67] can use a mix of strategies aiming for both organisational growth (breath scaling) and impacting practices and habits within the fashion industry (depth scaling), securing future scaling opportunities.

Adopting a product stewardship approach means companies need to rethink their product design and business models, including manufacturing and retail, rather than just attempting to convert a conventional product into a circular one [102]. To support the transition, [107] developed a multi-method simulation model that helps companies analyse the cost and revenue streams under a goods-as-a-service (or product service system) approach.

Repair and recycling are often more viable when implemented in combination with a product stewardship model, such as demonstrated in the case of MUD jeans [125], where the retailer or manufacturer retains ownership and/or responsibility for the product. This also encourages them to design products for easy and cost-effective maintenance [39], linked to the previously discussed eco-design strategies.

Sustainable Materials

Materials classified as sustainable may be recycled rather than virgin, sustainably sourced, recyclable (which does not guarantee they are recycled), compostable, or biodegradable. The latter often implies the (not always correct) assumption that the particles or components resulting from the biodegradation are harmless when entering the Earth's ecosystem. Some materials may degrade into toxic substances or harmful particles like microplastics [102]. In any case, further material specifications are necessary, alongside recycling instructions for consumers and processors.

In the context of CBMs, supply chain partnerships are essential to support recyclability, reusability, waste reduction, and ethical standards aligned with competitive strategies [124]. Circular procurement practices can enable this. Some fashion companies set their targets for using recycled materials [43]. For example, [83] showed the potential for the sustainable transformation of the clothing industry through the valorisation of conventionally discarded wool from a Swedish sheep farm to produce wool sweaters. It highlights the integration of sustainable practices, such as upcycling wool waste into new textiles or garments. Additionally, sourcing from local (i.e., European) producers reduces social risks, e.g., whether working conditions and salaries are fair. [43] emphasised the importance of certified sourcing (through certifications and audits) in fashion supply chains to ensure adherence to sustainability standards and highlighted the clear communication of information regarding the sustainability of raw materials and natural resources. The study also showed that fast fashion companies leverage digital technologies to optimise production processes, leading to more efficient use of materials and reduced waste, linking to the topic of sustainable factory operations.

Sustainable Operations

There are various interpretations of how circularity can be implemented through a company's operations: renewable energy and water stewardship [130] or zero waste manufacturing and cleaner production [120], for instance. [28] distinguished three areas of CE implementation: circular product innovation, circular production, and recycling practices, all of which can be part of a CBM in retail and manufacturing. Industrial symbiosis is suggested as a strategy to align sustainability (environmental, social, and economic benefits) and circularity (focused on reusing and recycling resources to minimise waste). This involves different companies sharing materials (including waste), services, and skills to achieve more sustainable operations. As a simple example, the heat generated by manufacturing could be used to heat a retail store. Such collaboration can lead to mutual benefits, such as reducing the costs associated with environmental investments and decreasing business risks.

Using the case of the automotive industry, [50] argued that "circular economy-based reverse logistics" enable companies to use resources more sustainably while also improving financial performance, for instance, through logistic optimisation. Through industrial case studies, Frishammar and Parida [54] showed that CBM implementation often means using fewer resources more efficiently, increasing resource recovery for reuse or recycling, prolonging the lifespans of components and products, optimising maintenance periods, and reducing waste through breakage and damage. [92] emphasised the significance of merging Industry 4.0 technologies with CE practices to develop a business model and sustainable operations centred on reusing and recycling waste materials, including scrap metal and electronic waste. [102] identified several new CBMs in fashion SMEs, emphasising strategies such as demand-driven production and customisation, extending the life of products, and product service systems, which can change the nature of retail. Slowing down the pace of fashion business practices by, for instance, decelerating product development and avoiding sales in favour of access-based consumption (i.e., renting or borrowing instead of buying) best satisfy circularity requirements [15]. [1] make a case for made-to-measure and on-demand manufacturing to minimise overproduction and waste, and [117] identify lean manufacturing as a path to reduce waste in a circular economy.

Social Aspects

The adoption of CBMs requires the buy-in of people along the whole value chain and may have beneficial effects on consumers, employees of retailers and manufacturers, or people involved in sourcing primary materials. Equitable employment and community engagement can be important aspects of CBM implementation. However, evidence of this was not found in the reviewed literature.

CBM implementation can promote social inclusiveness through the quality and quantity of jobs created in the value chain [45]. Bonfanti et al. [23] observed that companies implementing CBMs often also improve workplaces and engage employees with practices such as ensuring gender diversity, CSR in training, and creating opportunities for disabled people. [130] emphasise that circularity must be approached holistically, also taking social justice and the well-being of humans into account, and often value is co-created in business ecosystems [79].

Finally, [134] observed that the transition from a linear to a CBM is challenging to achieve. It often requires changes in several dimensions, including return logistics, customer relationships, contracts with dealers and service technicians, and remanufacturing processes. It is also necessary to consider the changing needs and demands of consumers and other stakeholders over time.

In conclusion, our review outlines fundamental mechanisms for incorporating circularity in retail and manufacturing, highlighting the importance of "R strategies", eco-design, product stewardship, sustainable materials, sustainable operations, and social considerations. These interconnected strategies suggest a comprehensive approach to sustainability, emphasising the shift from linear to CE practices. This review sets the stage for understanding the complex landscape of CBM, leading us to question what drives businesses to adopt these practices and implement CBMs.

Drivers for Implementing CBM in the Retail Sector

The literature review revealed that companies have different reasons for implementing CBMs, which we classify into five categories.

Value Creation

Creating and retaining the value of products, services, and processes is an overall driver of CBM development and adoption in retail, manufacturing, and across the whole value chain [53]. CBMs help minimise waste, reduce environmental impact, and promote sustainability. Adopting a CBM can also enhance a company's environmental, social and governance (ESG) and sustainability key performance indices (KPIs) [81]. A firm's appetite to create sustainable value leads them to focus on resource-efficient solutions through CBMs [11]. Value creation can bring environmental, economic, and social benefits [98], as elaborated and discussed subsequently.

Environmental Benefits

The environmental concerns relating to conventional forms of production, consumption, and disposal include high carbon footprints, ever-increasing consumption of natural resources, and landfill [86]. In contrast, the environmental benefits of CBMs, namely the reduction of carbon footprints and greenhouse gas emissions, energy and water consumption, influence retailers transitioning to CBMs [35, 86, 98].

As an example, in the textile industry, the sustainable manufacturing practices of MUD jeans lead to 78% saving of water and 61% saving of CO_2 per pair of jeans [125]. Besides material sourcing and manufacturing, the consumer use phase also has a significant environmental impact. For instance, a pay-per-use fee for the use of a washing machine contributes to environmental benefits by reducing greenhouse gas emissions by 19%, reducing waste and water usage [125].

Economic Benefits

[39] argued that economic benefits in the form of direct and indirect financial gains could be primary drivers for the adoption of CBMs, as illustrated in the CBM Canvas [114]. Additionally, many customers are increasingly sustainability-aware and ready to pay a premium for sustainable products [90], which incentivises CBM implementation in retail [11]. There is an anticipation of an economic boost stemming from increased resource efficiency in manufacturing and supply chains if CBMs are adopted [86, 92, 107]. Another potential economic benefit is employment creation, with CBMs expected to support a recycling culture leading to the collection, processing, remanufacturing, and selling of recycled products [92]. Arguably, companies that employ CBMs gain a competitive advantage over competitors via resource optimisation [61]. Many practitioners are aware of the potential economic benefits of the circular economy, particularly when they consider risk factors associated with the scarcity and costs of raw materials as well as related supply chain issues [94].

Social Benefits

Transitioning to a CBM is linked to community participation and engagement benefits, such as improved reputation and increased brand loyalty [50, 125]. Products designed to require fewer resources may be more ethical, especially regarding resources procured from problematic sources. Well-informed customers may have increased trust in brands that make and sell ethical and sustainable products, leading to a willingness to spend more [90].

Collaborations, Partnerships, and Stakeholder Expectations

CBMs require collaboration and partnership from multiple stakeholders, including suppliers, customers, policymakers, research, industries, and communities, and such partnerships can in turn facilitate and encourage the implementation of CBMs [65, 129]. Pressure from various stakeholders can also be a driver for CBM implementation [104]. Governments play a significant role by including CE in national strategies to foster the transition from linear to circular models [90]. Collaborations with universities and research institutions could create data needed to enable CBM development [98]. Partnerships with other firms [55] and collaborations with stakeholders [43] may help companies overcome barriers to CBM and drive their implementation. For instance, stakeholder collaborations can provide a platform for co-financing opportunities [129]. To develop successful CBMs, collaboration among stakeholders requires transparency and open communication across the whole value chain and with consumers. Certifications and eco-labels can help, especially when engaging in new collaborations.

Policies, Laws, and Regulatory Frameworks

Supportive regulatory frameworks are of utmost importance for facilitating and advancing the adoption of CBMs. In the European Union, for instance, there are key laws related to CE, such as the Ecodesign Framework Directive, the Waste Framework Directive, the EU Battery Directive, and Extended Producer Responsibility [4]. The latter imposes legal obligations on producers and importers to assume responsibility for reusing or recycling worn garments, for instance [30]. Retail chains in various countries are transitioning to CBMs to comply with stricter environmental regulations, with both retailers and resellers making efforts to adhere to environmental rules [35]. In some cases, Italy's SEZs use regulation to support CBMs [41] and there is a proposition of laws on mandatory repairability regulations by [100]. Laws and regulations are a significant driver of CBM innovation [63], but at the same time also one of the major barriers [109].

Technology and Innovation

Innovation in product and process design can enable and drive CBM adoption [13]. [93] highlighted that digitalisation is a significant catalyst for business model innovation, and it is a significant enabler for the transition [5]. It helps organisations enhance resource efficiency at various stages of the product life cycle. Business operations can also become more sustainable by leveraging AI to increase efficiency, automate analysis and decision-making [118]. Digitalisation can facilitate disruptive innovation, leading to a CBM. Transitioning to a CBM often requires a structural transformation in the conventional manufacturing model, which Industry 4.0 technologies can facilitate [92]. These technologies mediate the positive impact of CE application on organizational resilience, demonstrating their strategic importance for circular innovation [73]. Additionally, the convergence of Industry 5.0's sustainability functions with CE concepts underscores the potential for developing CBMs that leverage real-time data and intelligent manufacturing while prioritising human well-being and environmental conservation [9]. A human-centric approach provides a fertile ground for exploring and implementing CBMs. These models can integrate human needs and environmental sustainability into the core of business operations [57].

Certification and Standards

Sustainability or circularity certifications ensure that suppliers conform to pertinent standards and comply with specific regulations, which is increasingly important for industry partners as well as retail consumers. It enhances enterprise credibility [43], and stakeholders are more likely to be convinced of the viability, visibility, and reliability of the CBMs through sustainability certifications and accreditations. Such tools can highlight a business commitment to efficient use of resources, a clean environment, and fair trade [30]. [4] revealed that customers increasingly demand ethical and conflict-free product certification. Similarly, customer confidence in buying circular products increases if the companies have acceptable quality standards [90].

After reviewing why companies implement CBMs, the next question is which hurdles or barriers they must overcome.

Barriers to Implementing CBM in the Retail Sector

The literature provides ample discussion of barriers to CBM implementation, as described below. We classify the barriers into seven categories.

Consumer-Related Barriers

The consumer's role is central to the transition to CBMs. Educating and encouraging them to adapt their expectations and behaviours is paramount. [10] argued that consumers accustomed to a linear economy might find the principles of CBMs unfamiliar (e.g., modular product design to facilitate upgrading), and there is a pressing need to reshape longstanding consumption habits. Equally challenging are the adverse attitudes and reluctance towards circular products that may be refurbished, remanufactured, or offered as a product service system. This was noted by many authors including [91], [115], [13], [134], [92], [70], [98], [55], [125], and [107]. The uncertainty regarding consumer behaviour in the CE makes it challenging to assess the economic viability of CBMs [134]. Customers may hesitate to purchase sustainable products due to factors such as higher pricing, lack of awareness, and perceived quality [125]. Most customers prefer low-cost solutions [115].

[91] and [92] indicated that consumers may perceive circular products as inferior in quality or value, driven by misconceptions or lack of awareness. Similarly, for access-based business models, such as renting, sharing, or "product as a service" approaches, [107] argued that a lack of customer acceptance and willingness to pay can hinder their adoption in the retail industry. Some consumers may resist due to ingrained habits, scepticism, or resistance to paying a premium for ethical offerings [32, 90].

Gaining customer acceptance and aligning value delivery in CBMs extends beyond mere transactions of products or services. It involves creating a deeper resonance with consumer values, as highlighted by [54]. They stressed the importance of embedding values in CBMs that align closely with consumer beliefs, fostering a sense of meaning and purpose. This approach shifts the focus from traditional product sales to cultivating a willingness among consumers to embrace services and sustainable practices, changing mindsets and behaviours [59]. To achieve this, it is crucial to develop specialised skills in sustainability communication and education, ensuring that the value proposition of CBMs is not only about the tangible product or service but also about contributing to a greater ecological and social good.

Economic and Financial Barriers

[126] found that financial factors such as the availability of capital, expected economic benefits, and cost management competence, are the strongest barriers to CBM adoption. The financial aspect of pursuing CBMs is characterised by significant uncertainties. According to [4], the uncertain nature of future prices, technological advancements, and value chain development pose challenges for investors and businesses. Transitioning to a CBM is considered a financial risk and may cannibalise the sales of traditional products [120]. In this context, [121] identified three types of uncertainties related to implementing CBM: goal uncertainty, development uncertainty, and outcome uncertainty.

The trade-off between cost and sustainability benefits presents a further dilemma. Research has examined the trade-off between short-term expenses versus the long-term benefits of sustainability initiatives [70, 88, 98, 107, 125]. [125] highlighted concerns regarding the profitability of sustainable products, particularly regarding recycling. According to [125], in apparel, a significant challenge arises from the processing costs associated with the use of recycled materials. The expense of producing fabric from recycled sources is about 25% higher compared to fabrics made using conventional, virgin materials, impacting both manufacturing and pricing. [107] argued that transitioning to CBMs may result in higher costs and initial revenue gaps, as retail may not be able to increase prices in line with the cost increases. Shifting to service-oriented models can incur higher costs for manufacturers, potentially affecting profits and cash flow as recurring smaller revenues replace larger one-time income streams in the early stages of CBM adoption.

The transition to CBMs is not a minor adjustment but rather a substantial change that often necessitates significant investments [98, 120]. For instance, the integration of activities, including remanufacturing and refurbishment, may require the development of new supply chain strategies, reverse logistics processes, and re-engineered supplier relationships [98, 120]. It can be capital-intensive and require intensive upfront financing [98]. Challenges regarding the misperception of recycled product prices and tough competition with virgin materials can pose significant barriers, especially for smaller enterprises trying to persuade investors to support recycling initiatives [125, 129].

Technical and Operational Barriers

From an operational standpoint, the transition to CBMs is complicated. [22] stressed the challenge of discerning immediate sustainability outcomes when transitioning to a CBM. Given that many circular practices yield long-term benefits, gauging value in the short term can be challenging. There are also complex innovation challenges that companies face. [60]

underscored the intricate nature of innovations required, given the interdependencies and systemic shifts needed for CBMs. Other significant barriers are the technical feasibility of maintenance, repair, and remanufacturing processes [39, 123], the lack of suitable replacements for plastic packaging, and the limitations of currently available textile recycling processes [46]. Additionally, [102] identified a challenge related to sourcing complexity, which encompasses component costs, minimum order quantities, and supplier reluctance. Another challenge relates to the unclear remanufacturing standards and potentially poor quality of recovered used parts [115]. [43] brought attention to challenges associated with post-consumer product collection and traceability, which impede the establishment of closed-loop systems. These systems are essential for efficiently reintegrating products into the production cycle, ultimately hindering the successful implementation of CBMs. The backdrop of all these is the legal and regulatory landscape, which remains underdeveloped in this field.

Knowledge and Skills Barriers

Embarking on the CBM journey requires specific skills and expertise. [10] assessed the process of product designers aligning their practice with CBM principles. They argued that challenges in achieving a successful circular model involve coordinating customer needs and behaviours, materials and their sources, and designer competencies. They noted a need for designer skills and consumer education to address the challenges of altering consumer habits. This involves providing both designers and consumers with insights into manufacturing processes, overconsumption, waste management, energy usage, water conservation, and the use of chemicals. [115] agreed that there is a need to boost knowledge and competencies across the overall value chain. This is further compounded by a gap in sustainability awareness and challenges in assessing sustainability performance levels.

[86] emphasised the lack of industrial data on sustainability aspects, which hindered informed decision-making. In contrast, [98] drew attention to the monumental task of managing vast amounts of data generated by increasingly digitalised operations, ensuring that data analysis drives sustainable decisions. [11] argued that inadequate assessment before CBM implementation can lead to costly decisions and hinder successful outcomes. [60] spotlighted the knowledge gaps around innovation processes specific to CBMs. Similarly, [134] highlighted that CBMs are characterised by greater uncertainty during development and testing compared to linear business models. Verifying crucial BM assumptions and conducting field tests or pilots to confirm cost and retail revenue can be challenging and time-consuming, often spanning years. Sustainability performance and circular transitions are complex and dynamic, making them challenging to predict and plan for with objective formulas [11, 134]. Companies also need better methodological support to accurately predict the environmental impact of their CBM activities [113]. Therefore, these complexities require extensive planning efforts and a balance between entrepreneurial spirit and thorough assessment [11].

Organisational and Strategic Barriers

Internally, organisations face a myriad of strategic challenges in their CBM transition. [35] highlighted the problematic trade-offs between sustainable sourcing and cost-saving. Scholars also emphasised the lack of sharing of good practices [35] as well as insufficiently clear definitions and standards [123], which hinder CBM implementation. In some cases, retailers may shift the burden of responsibility onto consumers rather than proactively making sustainable choices themselves. Especially in industries like fashion, where there is an inherent tension between slow, sustainable consumption and the prevalent fast-fashion model [22]. [54] delved into the need for cultural change, especially from materials-intensive and product-oriented firms, requiring new organisational capabilities. [134] also highlighted change management challenges, noting that transitioning to a CBM requires shifts in time, mentality, and support from top management. Businesses often grapple with multilateral coordination and alignment challenges as they strive to ensure that various elements of their global operations seamlessly align with the CBM vision [54]. This is particularly challenging as companies often have to simultaneously operate both circular and linear business models [54, 134].

Another main challenge relates to fostering and maintaining effective stakeholder engagement, including with suppliers, customers, and local communities [11, 54, 120]. [120] argued that a lack of supply network support and compatibility of the CBM with the business models of the partner firms could hinder CBM implementation. [11] argued that large incumbent firms are often internally focused, overlooking stakeholder perspectives and ecosystem-level considerations, limiting their ability to identify suitable opportunities for CBMs. Additionally, high risks are associated with validating and launching a CBM [77], exacerbated by many companies still prioritising traditional measures for process optimisation over new market or business model development [93].

[39] addressed prioritisation issues, explaining that companies often postpone circular strategies due to immediate priorities such as finalising product and production line development. As companies perceive the end-of-life phase as distant for new products, they may postpone the development of recycling, remanufacturing, and refurbishment technologies.

Social and Reputation Barriers

The societal implications of CBMs are manifold. [83] drew attention to the potential social and reputational risks in supply chains, emphasising the need for ethical and inclusive transitions in coordination with retail consumers. In a world where brand reputation can make or break companies, ensuring that the transition to CBM is seamless and free from public relations mishaps is essential. Another aspect relates to the need for external validation. [55] argued that some companies may not fully grasp the value of circularity until they see external validation or face competition in the market, indicating that external factors or competitors can play a crucial role in influencing a company's adoption of circular practices. Additionally, internal resistance may come from employees accustomed to traditional business models, who may struggle with the required organisational cultural change when transitioning to CBMs [120]. [69] found that social and environmental barriers to CBM are often less visible than economic barriers due to a lack of standardised metrics and tools to quantify them.

Barriers Related to policies, laws, and Regulatory Frameworks

[115] articulated the constraints posed by inadequate or misaligned laws and regulations. Potential future adverse changes in laws and policies pose a further risk for companies

transitioning to CBMs [128]. [115] mentioned ineffective recycling policies, problematic tax regulations, and frequent policy changes impacting the manufacturing and retail sectors. [13] also identified the double taxation of remanufactured products as problematic; products are taxed once when they are first sold and again when they are sold after being remanufactured. Furthermore, many products, such as vehicles, do not meet current emission standards, making them ineligible for remanufacturing [115]. In the context of battery second life, inconsistent regulations have been identified as a key barrier to effective and scalable implementation [31]. This is symptomatic of a gap between local government plans and the remanufacturing plans of businesses, as well as a lack of wider national-level remanufacturing industry development plans. Especially in developing countries, there is often a lack of pertinent laws [30], insufficient institutional support [13], and inconsistent governmental enforcement of environmental regulations [124, 115].

Discussion, Implications and Future Work

Discussion

It is increasingly accepted that humanity has exceeded several planetary boundaries [106]. The climate emergency has become tangible. Many international organisations and scientists contend that it is time to rethink how we manage planetary resources and, in turn, how we organise business [110, 119]. Particularly, retail and manufacturing, which are two major contributors to resource extraction, consumption, and waste, play a crucial role in this rethinking.

Our review focused on both retail and manufacturing sectors, which generate significant environmental impacts due to overstock, product returns, and premature product disposal [101, 139]. Additionally, numerous sectors carelessly discard returned, unwanted, and end-of-life products, exacerbating environmental impact [17]. These behaviours overlook potential value retention through repair, remanufacturing, or upcycling – strategies central to companies adopting CBM [66, 78, 111]. This is especially relevant in the context of retailing, where sector-specific strategies and management decisions can significantly influence manufacturing practices. In this study, we examined what mechanisms companies are using to implement CBMs (RQ1), what drives them to do so (RQ2), and what barriers they face (RQ3) across both manufacturing and retail, based on factors identified across manufacturing and retail operations, consumer behaviour, regulatory conditions, and technical challenges. By identifying these mechanisms and contextual challenges, our study contributes to a deeper understanding of how circular business models can be practically adopted and scaled in both manufacturing and retail sectors.

Despite over two decades of academic research on CBM, with Fig. 2 highlighting a substantial increase since 2023 and numerous attempts at implementation, the tangible success of CBMs remains surprisingly limited in both scope and scale. Meanwhile, large companies selling linear, unsustainable products and services continue dominating the mainstream market. This disparity raises questions regarding the factors that are crucial for the successful adoption of CBMs, rather than merely stating their importance and benefits.

First, in Response to RQ1, we Need to Understand how CBMs are Adopted: The Mechanisms Our review outlined the multifaceted approaches to implementing circularity in retail and manufacturing by highlighting the importance of "R strategies," eco-design, product stewardship, sustainable materials, sustainable operations, and social considerations. These circular strategies guide retail and manufacturing businesses in extending product life cycles, sustainable sourcing, reducing waste, selling services rather than products, adopting product stewardship approaches, offering product take-back schemes, or running recommence platforms, which is fundamental to implementing CBMs. The SLR has also identified a complex interplay of factors that drive and hinder the transition to CBMs, which is often supported by a CBM innovation process [122].

Second, in Response to RQ2, we Need to Understand why Companies Set out to Adopt CBMs: The Drivers Our review revealed that the drivers to incorporate CBMs into the retail and manufacturing industries often derives from a multimodal value-creation strategy that emphasises environmental, economic, and social benefits. For retailers, this includes responding to eco-conscious consumers, branding demands, and tightening regulations. In manufacturing, innovation, cost efficiency, and compliance often play a more central role. However, the successful implementation of CBMs on a large scale requires that consumers are educated about the benefits of CBMs and encouraged to change their purchasing habits and preferences towards more sustainable products. For instance, in retail, collaboration extends to consumers through education, loyalty incentives, and accessibility of circular options (e.g., repair or resale platforms). As such, achieving meaningful progress also requires the formation of strategic collaborations and partnerships across industries, supply chains, and stakeholder groups.

Third, in Response to RQ3, we Need to Shed Light on what is Holding Companies Back: The Barriers The barriers to implementing CBMs in the retail sector are complex and deeply rooted. They encompass various dimensions, including consumer-related factors, economic and financial challenges, technical and operational issues, knowledge and skills gaps, organisational and strategic barriers, social and reputational concerns, and regulatory constraints. Consumer resistance to circular products is influenced by their misconceptions, lack of awareness, and ingrained preference for the linear economy. The economics of transitioning to CBMs is hindered by the uncertain and typically high initial costs, which discourage potential investments. The complexities of innovation, maintenance, and supply chain dynamics to support CBMs in retail pose significant operational challenges. The knowledge and skills gap in sustainability and CE principles are made more problematic by the scarcity of data and expertise, internal resistance and prioritising short-term financial gains over long-term sustainability. Regulatory barriers arise due to insufficient, misaligned, or frequently changing laws and policies, which are further exacerbated by inadequate enforcement and support from governmental entities. Overcoming these obstacles requires a comprehensive strategy that includes consumer education, supportive policies, investment in innovation, and a collective shift towards prioritising long-term sustainability over immediate profits.

Our review contributes a more holistic view by identifying both common and sector-specific drivers, mechanisms, and barriers in CBM adoption. By including retail, our review adds critical insight into demand-side dynamics, consumer-facing strategies, and downstream barriers. This dual-sector approach enhances our understanding of where sectoral strategies diverge or converge, and how CBMs might be scaled through coordinated actions across the supply chain. By emphasising the interdependence between manufacturing and retail, we provide actionable insights for businesses that straddle both (e.g., vertically integrated firms), as well as policymakers who aim to align interventions with sector-specific needs.

Implications for Practitioners and Policymakers

Based on the analysis of our SLR, we developed a series of recommendations for practitioners in retail and manufacturing of consumer goods who aim to implement a CBM, and for policymakers who want to support the transition to circularity and sustainability:

- Companies should interrogate what drives them to adopt a CBM, as understanding this will likely help them overcome internal and external barriers. CBMs should not be adopted merely to satisfy regulatory compliance or act as marketing tools; instead, companies should integrate their CBM into corporate strategy, operations, and innovation processes. For retailers, this means aligning circularity with customer-facing initiatives such as returns programs, resale platforms, or rental models.
- Open communication across departments and with stakeholders is key. The transition to circularity cannot happen in silos, and a systems thinking approach is necessary to understand stakeholder relationships and their dynamics. This includes employees, supply chain partners and other players in the business ecosystem, customers, non-governmental organisations and policymakers. Retailers, in particular, should prioritise transparent communication, eco-labelling, and customer incentives to shift consumer preferences and reduce misconceptions about circular offerings.
- Laws, regulations and policies are a key driver for CBM adoption. Many companies adopt them in reaction to or anticipation of laws requiring companies to follow sustainability principles and be transparent about their sourcing, manufacturing and general business practices. The EU Directives on sustainability and the circular economy are often cited as spearheading the transition; an example to be followed and improved on. Yet, they may not go far enough yet, as the transition requires further incentives and guidelines.
- Companies should build early partnerships and co-design strategies with stakeholders to ensure compatibility and buy-in from supply chain partners as well as consumers. Retailers and manufacturers alike should also allocate resources to pilot programs, experimentation, and cross-functional innovation teams, viewing risk as a necessary part of transformation.
- Retailers and manufacturers of consumer goods need to adopt a long-term investment mindset, supported by clear sustainability metrics and impact assessments to justify the transition. For retailers, investment in reverse logistics, product tracking technologies, and digital platforms will be critical to operationalising CBMs at scale.
- Policymakers should create coherent and stable policy environments for retailers and manufacturers, aligning laws with circular economy principles, and ensuring enforcement.
- Policymakers should enforce Extended Producer Responsibility and promote circular design standards to hold businesses accountable for product life cycles, from production

to disposal or reuse.

- Policymakers should facilitate platforms and funding mechanisms that bring together academia and businesses to co-create scalable circular innovations and business models.

Limitations and Avenues for Future Research

This study has some limitations, which offer avenues for future research. First, our study is limited to the retail and manufacturing sectors and thus does not capture drivers, barriers, and mechanisms in other industries. Second, this study was conducted in a single database (Scopus), with the potential omission of relevant studies from other databases. Future studies may expand the search to include Web of Science, Google Scholar, and domain-specific databases to ensure comprehensive inclusion. Third, our findings show key research gaps in the CBM literature:

- Our SLR shows that most studies focus on small-scale pilots, case studies, or niche applications with few mixed-methods or quantitative validation studies. There is a lack of longitudinal research tracking CBM adoption over time, especially in mainstream retail chains and large-scale manufacturers. Future research should investigate how CBMs can scale beyond pilot projects in large, mainstream retail and manufacturing firms, and what conditions enable such scalability and could also employ quantitative models, large-scale surveys, and simulation techniques to test CBM adoption theories and mechanisms.
- Our SLR shows an overrepresentation of fashion and electronics sectors, with underrepresentation of other consumer-facing retail areas (e.g., furniture, automotive aftermarket, sporting goods), construction materials, and cross-sector B2B supply chains. Therefore, future research should examine sector-specific challenges and opportunities, particularly in retail contexts that involve high product turnover, fragmented supply chains, or third-party resellers, and compare them with upstream manufacturing settings.
- Many studies cite consumer resistance, but few explore how to overcome it, or which communication strategies are most effective. Therefore, future research should explore consumer perceptions of circularity, willingness to pay, and trust in refurbished or shared products using behavioural experiments and segmentation analysis.
- Social aspects (e.g., job creation, fair labour, access equity) are often under-discussed. Social equity and inclusivity also remain marginal topics in the CBM discourse. Future studies should explore how CBMs can foster fair employment, support informal repair/reuse economies, and contribute to social justice goals, especially in contexts where labour exploitation risks remain high.
- Studies mention regulations as both drivers and barriers but rarely offer policy evaluation frameworks. Future research should evaluate how national and regional policy environments, incentives, and compliance mechanisms affect CBM development. Comparative policy studies can help identify best practices and unintended consequences, such as double taxation or inconsistent product standards, that hinder circular innovation.

- Many papers highlight benefits but lack **r**obust, comparable KPIs to evaluate CBM effectiveness across sectors. Future research could look at developing and validating cross-sector CBM performance frameworks that include environmental, economic, and social dimensions. These metrics should be tailored to capture both upstream manufacturing impacts and downstream retail outcomes.

Fourth, further investigation is needed into the organisational factors that determine CBM implementation success. One promising concept is Strategic Organisational Positioning (SOP), not in terms of physical market location, but as the strategic alignment of a firm's operations, leadership, culture, and stakeholder relationships to support circularity. Key SOP dimensions may include top-level management commitment, inter- and intra-organisational collaboration, long-term supply chain partnerships, and consumer engagement in circular practices. These elements facilitate systemic change and sustained competitive advantage. Future research should explore how SOP influences CBM effectiveness and under what conditions it serves as a critical enabler of circular transformation.

Table 4 summarises the identified research gaps and briefly explains the associated avenues for future research.

Table 4 Summary of research gaps and future research directions

Research Gap	Description	Recommended Future Research
1. Limited CBM scalability evidence	Most studies examine pilots or niche firms, not large-scale transitions.	Longitudinal and comparative studies on mainstream adoption and upscaling in large firms.
2. Sectoral imbalance	Overemphasis on fashion and electronics; other sectors are underexplored.	Investigate CBMs in underrepresented sectors (e.g., automotive, construction, B2B retail).
3. Underdeveloped Strategic Organisational Positioning (SOP)	SOP is conceptually promising but lacks empirical validation.	Define, operationalise, and empirically test SOP's role in CBM success.
4. Consumer resistance and behaviour	Consumer perceptions and trust in circular products are poorly understood.	Behavioural experiments and segmentation studies on circular product acceptance.
5. Lack of standardised CBM performance metrics	Inconsistent KPIs across studies; limited benchmarking.	Develop validated multi-dimensional performance frameworks (environmental, economic, social).
6. Marginalisation of social equity	Social impacts (labour, inclusiveness) are rarely addressed in depth.	Explore how CBMs influence ethical sourcing, inclusive employment, and social wellbeing.
7. Policy and regulatory inconsistencies	Regulations are often barriers but rarely evaluated systematically.	Policy analysis and cross-country comparisons to identify effective regulatory models.
8. Methodological limitations	Over-reliance on qualitative case studies limits generalisability.	Use mixed-methods, large-N surveys, and simulation models to validate findings.

Appendix 1

Table 5 List of all publications

SN	Authors	Title	Year	Source
1	Abdelmeguid, et al. [1]	Towards circular fashion: Management strategies promoting circular behaviour along the value chain	2024	Sustainable Production and Consumption
2	Alshammari, et al. [5]	Digital Capability as an Enabler of Circular Economy in Saudi Arabia's Manufacturing Sector	2024	Proceedings of the International Conference on Sustainability
3	Agrawal, et al. [3]	The Pivotal Role of Dynamic Capabilities in Enabling Circular Business Models and Firm Performance	2024	Circular Economy and Sustainability
4	Agrawal, et al. [2]	Analyzing coordination strategy of circular supply chain in re-commerce industry: A game theoretic approach	2023	Business Strategy and the Environment
5	Albertsen, et al. [4]	Circular business models for electric vehicle lithium-ion batteries: An analysis of current practices of vehicle manufacturers and policies in the EU	2021	Resources, Conservation and Recycling
6	Ardolino, et al. [7]	Barriers and Challenges Toward the Servitization of the Machinery Sector: Evidence from Theory and Practice.	2024	IFIP International Conference on Advances in Production Management Systems
7	Atif, [9]	Analysing the alignment between circular economy and industry 4.0 nexus with industry 5.0 era: An integrative systematic literature review	2023	Sustainable Development
8	Avadanei, et al. [10]	Clothing development process towards a circular model	2021	Industria Textila
9	Averina, et al. [11]	Assessing sustainability opportunities for circular business models	2022	Business Strategy and the Environment
10	Bacovis & Borchardt, [13]	Circular Business Models: A Multiple Case Study in Manufacturing Companies in Northern Brazil	2022	Industrial Engineering and Operations Management. IJCIEOM 2022
11	Barletta, et al. [15]	Business strategy and innovative models in the fashion industry: Clothing leasing as a driver of sustainability	2024	Business Strategy and the Environment
12	Bocken, [21]	Circular business model innovation: new avenues and game changers	2024	Business model innovation: Game changers and contemporary issues
13	Bocken, et al. [22]	Slowing resource loops in the Circular Economy: an experimentation approach in fashion retail	2019	Proceedings of the 5th International Conference on Sustainable
14	Bonfanti, et al. [23]	The contribution of manufacturing companies to the achievement of sustainable development goals: An empirical analysis of the operationalization of sustainable business models.	2023	Business Strategy and the Environment
15	Bressanelli, et al. [24]	Are digital servitization-based Circular Economy business models sustainable? A systemic what-if simulation model	2024	Journal of Cleaner Production
16	Cagno, et al. [27]	Understanding how circular economy practices and digital technologies are adopted and interrelated: A broad empirical study in the manufacturing sector.	2025	Resources, Conservation and Recycling

Table 5 (continued)

SN	Authors	Title	Year	Source
17	Castro-Lopez, et al. [28]	Organizational capabilities and institutional pressures in the adoption of circular economy	2023	Journal of Business Research
18	Centobelli, et al. [30]	Slowing the fast fashion industry: An all-round perspective	2022	Current Opinion in Green and Sustainable Chemistry
19	Chirumalla et al. [32]	The transition from a linear to a circular economy through a multi-level readiness framework: An explorative study in the heavy-duty vehicle manufacturing industry	2024	Journal of Innovation & Knowledge
20	Dagilienė, et al. [35]	Exploring institutional competing logic for sustainability implementation of retail chains	2022	International Journal of Retail & Distribution Management
21	De Angelis, [36]	Circular economy business models as resilient, complex adaptive systems	2022	Business Strategy and the Environment
22	De Angelis, [37]	Circular economy business models: A repertoire of theoretical relationships and a research agenda	2022	Circular economy and sustainability
23	Dell'Ambrogio, et al. [39]	Design of circular economy enhancing journeys for automotive manufacturing industry	2022	Proceedings 2022 IEEE ICE/ITMC-IAMOT
24	Di Ruocco, [41]	Designing a sustainable business model for green transition of SEZ in Campania—Towards the conceptual framework	2023	Highlights of Sustainability
25	Dragomir & Dumitru, [43]	Practical solutions for circular business models in the fashion industry	2022	Cleaner Logistics and Supply Chain
26	Ezeudu & Kennedy, [45]	Insights and dynamics of circular business model in developing countries' context: The empirical analysis of the returnable glass bottles process.	2024	Business Strategy & Development
27	Farrukh & Sajjad, [46]	Drivers for and barriers to circular economy transition in the textile industry: A developing economy perspective	2024	Sustainable Development
28	Fedele & Formisano, [47]	Waste from criticality to resource through an innovative circular business model: A case study in the manufacturing industry	2023	Journal of Cleaner Production
29	Fernando, et al. [50]	Circular economy-based reverse logistics: dynamic interplay between sustainable resource commitment and financial performance	2023	European Journal of Management and Business Economics
30	Franze, et al. [52]	Scaling up a circular business model for remanufacturing: A case study of a sustainable value creation strategy for the white goods industry.	2024	Business Strategy and the Environment
31	Frei, et al. [53]	Sustainable reverse supply chains and circular economy in multichannel retail returns	2020	Business Strategy and the Environment
32	Frishammar & Parida, [54]	Circular business model transformation: A roadmap for incumbent firms	2019	California Management Review
33	Galvão, et al. [55]	Circular business model: Breaking down barriers towards sustainable development	2022	Business Strategy and the Environment
34	Gomes, et al. [59]	Consumer engagement in circular consumption systems: a roadmap structure for apparel retail companies	2024	Circular Economy and Sustainability
35	Guldmann & Huulgaard, [60]	Circular Business Model Innovation for Sustainable Development	2019	Innovation for Sustainability

Table 5 (continued)

SN	Authors	Title	Year	Source
36	Gusmerotti, et al. [61]	Drivers and approaches to the circular economy in manufacturing firms	2019	Journal of Cleaner Production
37	Ghobakhloo, et al. [57]	Identifying industry 5.0 contributions to sustainable development: A strategy roadmap for delivering sustainability values	2022	Sustainable Production and Consumption
38	Hellström & Olsson, [63]	Let's go thrift shopping: exploring circular business model innovation in fashion retail	2024	Technological Forecasting and Social Change
39	Ho, et al. [65]	Barriers and Opportunities when Transitioning from Linear to Circular Business Models: Evidence from the Construction and Manufacturing Sectors in The Netherlands	2025	Circular Economy and Sustainability
40	Hultberg, E. [67]	Scaling circular business models: strategic paths of second-hand fashion retail	2025	Journal of Fashion Marketing and Management: An International Journal
41	Hultberg & Pal [68]	Lessons on business model scalability for circular economy in the fashion retail value chain: Towards a conceptual model	2021	Sustainable Production and Consumption
42	Hultberg & Pal [69]	Exploring scalability from a triple bottom line perspective: challenges and strategic resources for fashion resale.	2023	Circular Economy and Sustainability
43	Hunka, et al. [70]	Determinants of consumer demand for circular economy products. A case for reuse and remanufacturing for sustainable development	2021	Business Strategy and the Environment
44	Iacovidou, et al. [71]	A systems thinking approach to understanding the challenges of achieving the circular economy	2021	Environmental Science and Pollution Research
45	Koers, et al. [76]	Product-as-a-service from B2C retailers' perspective: a framework of challenges and mitigations	2024	International Journal of Retail & Distribution Management
46	Linder & Williander, [77]	Circular business model innovation: inherent uncertainties	2017	Business Strategy and the Environment
47	de Lopes de et al. [73]	Does applying a circular business model lead to organizational resilience? Mediating effects of Industry 4.0 and customers integration	2023	Technological Forecasting and Social Change
48	Malakhatka, et al. [79]	Contribution model ecosystem for resiliency and sustainability	2023	Smart Services Summit
49	Mamdouh, [80]	Life Cycle Sustainability Assessment as a Tool for Businesses in a Circular Economy: Business Examples from Egypt	2025	Circular Economy in Sustainable Supply Chains
50	Margherita, et al. [81]	Digital Transformation and Green Operations: A Successful Entrepreneurial Journey at Portobello Shop	2024	IEEE Transactions on Engineering Management
51	Marques-McEwan & Bititci, [82]	Understanding the implications of circular business models for businesses and supply chains	2023	IFIP International Conference on Advances in Production Management Systems
52	Martin & Herlaar, [83]	Environmental and social performance of valorizing waste wool for sweater production	2021	Sustainable production and consumption
53	Mendoza, et al. [86]	Disposable baby diapers: Life cycle costs, eco-efficiency and circular economy	2019	Journal of Cleaner Production

Table 5 (continued)

SN	Authors	Title	Year	Source
54	Mendoza & Pigosso, [85]	How ready is the wind energy industry for the circular economy?	2023	Sustainable Production and Consumption
55	Moreno, et al. [88]	Opportunities for redistributed manufacturing and digital intelligence as enablers of a circular economy	2019	International Journal of Sustainable Engineering
56	Moro, et al. [89]	Design of a sustainable electric vehicle sharing business model in the Brazilian context	2023	International Journal of Industrial Engineering and Management
57	Mostaghel & Chirumalla, [90]	Role of customers in circular business models	2021	Journal of Business Research
58	Muranko, et al. [91]	Circular economy and behaviour change: Using persuasive communication to encourage pro-circular behaviours towards the purchase of remanufactured refrigeration equipment.	2019	Journal of Cleaner Production
59	Nascimento, et al. [92]	Exploring Industry 4.0 technologies to enable circular economy practices in a manufacturing context: A business model proposal	2019	Journal of Manufacturing Technology Management
60	Neligan, et al. [93]	Circular disruption: Digitalisation as a driver of circular economy business models	2023	Business Strategy and the Environment
61	Ngan, et al. [94]	Enabling circular practices in the manufacturing industry: Barriers and challenges	2023	Chemical Engineering Transactions
62	Oghazi, et al. [96]	International industrial manufacturers: Mastering the era of digital innovation and circular economy	2024	Technological Forecasting and Social Change
63	Okorie, et al. [98]	Circular business models in high value manufacturing: Five industry cases to bridge theory and practice	2021	Business Strategy and the Environment
64	Parchomenko, et al. [100]	The circular economy potential of reversible bonding in smartphones	2023	Sustainable Production and Consumption
65	Piller, [102]	Designing for circularity: sustainable pathways for Australian fashion small to medium enterprises	2023	Journal of Fashion Marketing and Management: An International Journal
66	Pruhs, et al. [103]	Design for circularity in manufacturing industries–operationalisation and decision support	2024	Resources, Conservation and Recycling
67	Rahman, et al. [104]	Role of sustainable business model, Industry 4.0, crowdfunding, and stakeholders' pressure toward firm's sustainability	2024	Business Strategy and the Environment
68	Roci & Rashid, [107]	Economic and environmental impact of circular business models	2023	Journal of Cleaner Production
69	Ronaghi, [108]	The influence of artificial intelligence adoption on circular economy practices in manufacturing industries	2023	Environment, Development and Sustainability
70	Rossi, et al. [109]	Hierarchical analysis of barriers to circular business models in the recycling industry	2025	Environmental Technology
71	Sandberg & Hultberg, [112]	Dynamic capabilities for the scaling of circular business model initiatives in the fashion industry	2021	Journal of Cleaner Production
72	Sartini, et al. [113]	Towards Sustainable Furniture: Evaluating Environmental Impact Perception and Tools for Circular Design	2024	International Conference of the Italian Association of Design Methods and Tools for Industrial Engineering

Table 5 (continued)

SN	Authors	Title	Year	Source
73	Scholtysik, et al. [114]	Designing business models for a circular economy	2023	Proceedings of the Design Society
74	Shao, et al. [115]	Circular business models generation for automobile remanufacturing industry in China: Barriers and opportunities	2020	Journal of Manufacturing Technology Management
75	Singh, et al. [117]	Transforming Sustainable Business Models for Manufacturing Industry to Build Zero Carbon Industry	2025	Zero Carbon Industry, Eco-Innovation and Environmental Sustainability
76	Sousa-Zomer, et al. [120]	Exploring the challenges for circular business implementation in manufacturing companies: An empirical investigation of a pay-per-use service provider	2018	Resources, Conservation and Recycling
77	Sjödin, et al. [118]	Artificial intelligence enabling circular business model innovation in digital servitization: Conceptualizing dynamic capabilities, AI capacities, business models and effects.	2023	Technological Forecasting and Social Change
78	Stingl, et al. [121]	Uncertainty Management In Circular Business Model Innovation–The Case Of Circular Plastics.	2023	Proceedings of the Design Society
79	Stumpf, et al. [123]	Climbing up the circularity ladder?–A mixed-methods analysis of circular economy in business practice	2021	Journal of Cleaner Production
80	Tanveer, et al. [124]	The critical role of procurement in the emergence of circular business models: Insights from multiple cases of Vietnamese manufacturers.	2024	Business Strategy and the Environment
81	Thatta & Polisetty, [125]	The Future Is Circular: A Case Study on MUD Jeans	2022	FIIB Business Review
82	Tran & Nguyen-Thi-Phuong, [126]	The influence of financial and non-financial factors on the adopting intentions of businesses towards circular business models: Evidence from Vietnam	2024	Corporate Social Responsibility and Environmental Management
83	Tuni, et al. [128]	Risks in circular business models innovation: A cross-industrial case study for composite materials	2024	Business Strategy and the Environment
84	Uhrenholt, et al. [129]	Circular economy: Factors affecting the financial performance of product take-back systems	2022	Journal of Cleaner Production
85	Ünal & Shao, [130]	A taxonomy of circular economy implementation strategies for manufacturing firms: Analysis of 391 cradle-to-cradle products	2019	Journal of Cleaner Production
86	Urbinati, et al. [132]	Exploiting 3-D printing for designing circular business models: A novel framework	2023	IEEE Transactions on Engineering Management
87	Van Loon, et al. [134]	Designing a circular business strategy: 7 years of evolution at a large washing machine manufacturer	2022	Business Strategy and the Environment
88	Wörner & Friedli, [137]	Role of Recycling Towards a Sustainable Business Model: A Perspective on Industrial Assets	2022	Global Conference on Sustainable Manufacturing
89	Zambujal-Oliveira, et al. [138]	Aligning Financing Strategies With Circular Business Principles: A Multicriteria Decision Framework	2025	Business Strategy and the Environment
90	Zilia, et al. [141]	Trash or treasure? A circular business model of recycling plasmix.	2024	Circular Economy

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Declarations

Conflict of Interest The authors do not have any conflicts of interest.

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