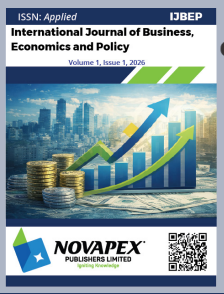

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Sustainable business models: A review of current trends and future directions

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ABSTRACT

This shift from traditional, fixed competitive positioning to dynamic, digitally enabled models meant to position themselves strategically around great environmental fluidity has accelerated the change of business strategy between 2020 and 2025. This transformation does highlight the need of merging digital transformation with sustainable business models (SBM) as complementary organizational response to global disruptions. However, contemporary academic research illustrates those dynamic capabilities dealing with amid sensing, seizing and reconfiguring resources towards achieving sustainable competitive advantage, yet convergence socioeconomic profitability alongside social and environmental responsibility are the key to prosperous organizations today. The result of this new paradigm is the "twin transition," where digitalization and sustainability meet to drive innovation through the principles of the circular economy (CE) and stakeholder engagement. However, as business innovation evolves from an internal-to-the-organization challenge to a multi-dimensional, ecosystem-based "wicked problem," organizations face the dilemma of balancing the leveraging of existing (safe) strengths against pursuing those that seem promising but are uncharted territory. Looking forward, the frontier is strategic, where executives will adopt value-measurement frameworks that incorporates decarbonization and ESG dimensions into the DNA of business models.

KEYWORDS: sustainable business models, circular economy integration, digitalization and sustainability

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1. Introduction

The term sustainable business model has found an unprecedented place in both, academic literature and business practice over the last two decades due to increasing environmental issues and social imperatives meticulously according to maintaining such approaches which indicate that existing business models are not sufficient for leading companies with sustainable means. Sustainable business models embody a holistic redefinition of how organizations create, deliver and capture value while finding solutions to simultaneously meet the economic, environmental and social dimensions of sustainability (Nosratabadi et al. 2019). This shift in paradigm is indicative of a larger transition inherent within corporate strategy where it shifts from merely making marginal changes on how business usually operates, to structural innovation where sustainability becomes embedded into the very logic of business.

Research on sustainable business models has proliferated, and the field is growing rapidly and diversifying across a range of disciplines, sectors and geographic contexts (Marczewska et al., 2020). Such expansion mirrors both the urgency of sustainability challenges but also acknowledgment that business model innovation is a potent lever for organizational transformation. Yet the swift expansion of this burgeoning field has generated a remarkable diversity in theoretical perspectives, methodological deployments, and empirical concerns that complicates synthesis and the construction of cumulative knowledge (Palmié et al., 2024).

The goal of this literature review is to systematically analyse how sustainable business models have been researched so far, outlining well-established trends, neglected areas as well as challenges and opportunities for future studies. Drawing upon peer reviewed literature published between 2010 and 2025, this review offers a holistic view of how far the field has come, where it sits now and where it is going. The systematic review contributes to that inquiry by answering three overarching research questions: what are the dominant trends in sustainable business model research? Which schools of thought remain methodological and theoretical challenges in the field? What are the most fruitful avenues for future research and practice?

2. Theoretical Foundations and Conceptual Development

The theoretical landscape of sustainable business models has evolved significantly, building on multiple indigenous streams of thought such as strategic management, sustainability science, innovation studies, and organizational theory. Ferreira et al. According to (2021), theorization in this field is dominated by five contemporary theoretical foci that together interweave the intellectual structure of the field: SBM implementation, SBM challenges, institutional SBM, circular SBM and emerging SBM. This classification shows that the research on business sustainability models is interdisciplinary in nature and that the phenomenon is described through various lens as adopted by the scholars.

Sustainable business models (SBMs) theoretical foundation has its major focus on the dilemma regarding how organizations create, deliver and capture value while balancing economic, environmental and social objectives simultaneously (Elkington, 1994; Gonzalez, 2016). Building on the foundational business model definitions articulated by Osterwalder and Pigneur (2010), literature such as Nosratabadi et al. (2019) define SBMs as the mechanisms of how organizations develop activities to operate economically, socially and culturally viable. And this construction process is an integral aspect of the innovation of business strategy. It crystallizes a vision of SBMs in which they are not just features that can result in add-ons to existing architectures, but rather they represent an epistemic transformation that reshuffles the very logic of an organization.

Initial scholarship predominantly explored promising sustainable formats and classification systems. However, Li et al. (2023) using scientometric analysis described a paradigm shift. They discovered that general concepts such as “sustainable innovation” and “supply chain” predominated in core hotspots between 1998 and 2012. Focus shift between 2013 and 2017 to resource-based view, life cycle assessment and regional studies china Since 2019, the field has formed around high-impact

themes like the circular economy and decarbonization a direct reaction to pressures on global climate and resources.

Allen & Vandyke (2020) highlighted that, despite considerable research on value proposition, creation, delivery, and capture, the literature lacked a holistic view towards sustainable value, both in its measurement and representation in models and frameworks. However, the observation highlights a significant missing piece in our theoretical development integrative frameworks that consider the complexity and interdependence of the core processes and mechanisms involved in sustainable value creation.

3. Methodological Landscape of SBM Research

The methodological patterns and limitations we identify help explain how the field of sustainable business model research is evolving. Bommel et al. Applying a systematic analysis of 104 articles published between 2008 and 2019, McKinsey & Company (2020) observes the flourishing existence of SBM research with, however, a lasting want for qualitative contributions, mainly derived from case evidence. Although scarce, quantitative studies that identify causalities, correlations, and generalization also are relatively few, and this is a critical methodological hole in the field.

Both the exploratory, nascent nature of the field, and the nature of sustainable business model phenomena better lend themselves to in-depth, contextualized qualitative case study research which is reflected in the dominance of qualitative study approach. This methodological focus, however, also restricts the capacity of the field to generate generalizable findings, qualifies theoretical propositions and deliver evidence-based guidance for practitioners wishing to scale up sustainable business models. Bommel et al. Melnyk et al (2020), argue that the empirical focus on sectors and specific countries must be wider so that general conclusions can be drawn, since the current approach can lead to geographic and sectoral concentration that limits the generalizability of findings.

Bibliometric and scientometric approaches are valuable methodological tools available to researchers that assist in delineating the intellectual structure and evolution of the field of sustainable business models. Many studies have used these methods for hotspot detection, citation tracking and exploration of emergent trends (Ferreira et al., 2021; Li et al., 2023; Marczewska et al., 2020; Vaio et al., 2021). These approaches offer a bird's eye view of the evolution of the field by establishing prominent works, tenets and research gaps in the literature. They do this though in addition to, rather than as replacements for the basic empirical research that produces new knowledge about sustainable business model phenomena.

The increasing prominence of systematic literature reviews has mirrored the field maturation process along with an exponential growth in research outputs. Studies by Karuppiah et al. (2023), Agwu et al. (2021), Süß et al. (2021), and Brenner et al. This trend can be observed in the two recent papers by (2023) and (2023), that use systematic review methodologies to assess existing knowledge and patterns and to summarize research agendas. The systematic review approaches (eg, PRISMA) indicate increasing methodological rigor and a shift in the field toward a more systematic approach to knowledge accumulation

4. Current Trends in Sustainable Business Models

4.1 Circular Economy and Circular Business Models

One of the most well-known and impactful trends in sustainable business model research is the incorporation of circular economy principles into business model innovation. Circular business models that stress resource efficiency, waste reduction, product lifetime expansion, and closed-loop systems have been recognized as an emerging and dynamic subclass in sustainable business models literature (Geissdoerfer et al, 2020). The circular economy challenges the linear "take-make-dispose" model and offers restorative systems that keep products, components and materials at their highest utility and

value.

Ferasso et al. (2020). Compared with the 253 articles used for this analysis. Wang et al. (2020) has clustered a co-occurrence of topics found within the circular economy (CE) business model and extracted comprehensive themes such as business models, value, supply chain, transition, resource, waste, and reuse. The study emphasized emerging themes associated with managerial, supply side, demand side, networking, performance, and contextual aspects of circular business models, suggesting a multidimensional perspective on circular economy implementation. The complexity here is indicative both of all the systemic change that will be needed to move from linear to circular business models, both in the organization itself, with change to the supply chain, and engagement with all stakeholders involved along with the requirement for institutional support.

The literature comprises notable sector applications of circular business models, exploring their implementation in various domains. Islam et al. (2022) analyzed recycling perspectives and provided essential needs for business models which target recycling such as efficiency in municipal solid waste management, cost reporting of recycled materials, and strategic partnerships. By covering various applications associated with circular business models, the study illustrated its applicability from waste solar PV panels, e-waste, and textile waste to vehicle and battery sectors. Technological innovations such as 3D printing, sensor-based RFID tags, digital twins, additive manufacturing, Industry 4.0 and Internet of Things, that support the implementation of circular business models, allow to keep track of materials in an efficient manner and recover and reprocess materials more efficiently.

Reim et al. (2019) studied circular business models only in the context of the bio-economy and forest-based industries. The research has also highlighted several unique attributes of circular business models in the context of the bio-economy such as bio-material characteristics, supply chain complexity, and market development and has emphasized the alignment of business model inter-elements as a necessary condition of successful implementation. This suggests that while the circular economy is an overall relevant concept, its practices should also be adapted to specific industries and types of materials used.

4.2 Digital-Sustainable Business Model Integration

This topic of the confluence of digitalization and sustainability is an emerging frontier in research on sustainable business models, as it acknowledges that digital technologies may allow, speed up, and magnify sustainability impacts. Palmié et al. (2024) presented a strategic business model management framework for digital-sustainable business models based on an integrative literature review of 134 published studies between 2007 and 2023. The findings indicate that the relevant literature on digital-sustainable business models is exceedingly fragmented because of varying roots in digitization, sustainability, and business model literature, requiring integrative frameworks to synthesize insights.

Digital technologies enable sustainable business models through enhancing resource efficiency, improving transparency and creating new data-driven value propositions (Plečko & Bradač Hojnik, 2024; Rodriguez Santiago, 2024). Digital and sustainable models can create complementarities, where capabilities in the digital domain help generate better sustainability outcomes.However, **Palmié et al. (2024)** argue that these transitions are often characterized by "conflicting logics" (Rodriguez Santiago, 2024). Potential tensions — such as the considerable energy consumed by digital infrastructures and the environmental costs of e-waste — have all been flagged up as serious "dark sides" to this transformation. (**Lerch et al., 2024; Plečko & Bradač Hojnik, 2024**).

Digital technologies have been the focus of attention particularly in having pivotal roles for circular business models. Islam et al. (2022) have characterized cutting-edge technological innovations used to form the recycling-oriented circular business models, such as, sensor-based RFID tags, digital twin, additive manufacturing, Industry 4.0, and Internet of Things. Such technologies allow for more accurate tracking of materials through supply chains, increased efficiency of resource recovery systems,

and the development of digital platforms that enable secondary material markets. Digital technologies play a role not only as an improvement over traditional circular business models but also as an essential enabler for the circular economy transitions.

4.3 Stakeholder Engagement and Value Co-Creation

Stakeholder engagement and value co-creation in sustainable business model have become hot topics as researchers and practitioners acknowledge that sustainability challenges need approaches that go beyond organizations. Comin et al. Del Giudice et al. (2019) showed that sustainable business models should be conceived as processes that facilitate the provision of sustainable value through a direct engagement of stakeholders, particularly users. In particular, this emphasis on stakeholders marks a significant departure from traditional business models centered on shareholder value and adding value for multiple stakeholders and types of capital.

The focus on stakeholder engagement in sustainable business model innovation is demonstrated by incorporating design thinking. Khalid et al. (2023) found that the four prominent design thinking methods in the literature are workshops, brainstorming, co-creation, and prototyping. Although these components enable stakeholder analysis, results further indicate prototyping and testing to be an important shortcoming (Petri et al., 2025). This suggests that there is agreement on the need for engagement yet continued absence of relevant methodologies for the iteration and validation of sustainable models in real-world settings.

Integrated thinking and reporting has developed as one way to reduce the gap between stakeholder engagement and sustainable business model development. Vaio et al. (2021) performed a bibliometric study exploring how integrated reporting and integrated thinking contribute to the development of sustainable business models. Their research demonstrated that these practices have transformed the way companies communicate and generate value by promoting process integration and more efficient resource allocation aligned with circular economy principles. Nonetheless, in practical market settings, integrated reporting and thinking are still predominantly viewed as reporting mechanisms to satisfy stakeholder demands, rather than as essential tools for corporate governance, highlighting a disconnect between their theoretical potential and actual application.

4.4 Sector-Specific Developments

Over the years, sector-specific contexts have gained popularity as a valuable dimension within sustainable business model research, making this the focus of studies addressing implementation challenges and opportunities across various industries. This is a high-impact sector with a large potential for sustainable business model innovation thus, it has attracted considerable attention. Agwu et al. (2021) a systematic review of sustainable business models in manufacturing, highlighting a continuous transition to sustainable business models between different sectors of the industry. Despite this, the study found that there has been limited empirical work on how manufacturing firms ought to, or can, create and deliver a sustainable (in terms of economic value) production operation while meeting their sustainability objectives.

The construction industry is a significant focus of sustainable business model research due to its high resource use and environmental impact. Munaro et al. (2021) investigated circular business models aimed at sustainable building practices, highlighting that Europe and Asia contribute 91% of the reviewed literature and lead research efforts in circular construction models. This regional concentration of studies corresponds to specific policy measures supporting the circular economy and reflects differing degrees of institutional backing for sustainable construction across various areas.

Sustainable business model research has evolved into a distinct research area, specifically regarding the bio-economy sector and the related issues of forest-based industries as well as renewable biological

resources. Reim et al. (2019) identifies gaps in the current literature. Although the importance of novel business models for the bio-economy is often highlighted in the bio-economy literature, this specifically related to circular business models is fragmented and underdeveloped. It reiterated that for the bio-economy it was especially important that both business model components were aligned and complementary with each other because of the very specific challenges that the bio-economy faces, for example, the variability, perishability, and complexity of biological supply chains.

5. Key Challenges and Barriers

The field continues to struggle with some inherent limitations, despite a growing interest and an explosion of research into sustainable business models, in both theoretical advancement and practical application. Bommel et al. (2020) identified multiple methodological challenges, such as an overwhelming focus on qualitative case studies relative to quantitative research, geographic and sectoral fragmentation of empirical work, and a lack of analysis regarding causality, correlations, or generalization. Such methodological constraints hold the field back from building strong theoretical propositions and translating into prudent evidence-based guidance for practitioners.

Theoretical obstacles consist of a dispersed field with many divergent approaches, and the absence of unifying frameworks that could address the multi-faceted process underlying sustainable value creation. Silvia et al. (2020) points out that adequate research for sustainable business models remains lacking a holistic approach to balancing value measurement and representation between model or framework perspectives. This discrepancy highlights the underlying challenge of translating sustainability ideas into concrete applications, which span multiple dimensions and time horizons, as well as stakeholder perspectives that do not lend themselves to straightforward quantification or aggregation.

Implementation challenges are also significant areas of concern. Ferreira et al. As (2021) noted, SBM implementation and challenges associated with it are two of the five dominating theoretical foci in the field which shows that scholars acknowledge organizations' difficulties to transform sustainability business model concepts into action. Such challenges include organizational inertia and resistance to change, misalignment between sustainability objectives and existing incentive structures, lack of capabilities and resources for sustainable business model innovation paired with regulatory and institutional barriers, as well as difficulties in measuring and demonstrating the value of sustainable business models.

It is especially true when discussing the economic viability of sustainable business models and in a specific what extent they create and seize an economic value. Agwu et al. (2021) noticed that esearch has focused on the social and environmental aspects of sustainability in manufacturing, but generating and providing sustainable economic value is still a rather unexplored domain. Fill this gap represents a fundamental tension in sustainable business models — the necessity to prove economic performance while also trying to advance environmental and social goals that may not yield economic returns in the short-term

6. Future Research Directions

6.1 Methodological Advancements

Sustainable business model research going forward needs to make a strong methodological leap, overcoming current limits for more rigorous knowledge building. Bommel et al. (2020) highlights a need to broaden which studies are carried out and their methodologies, especially by formalizing the use of more quantitative approaches that can determine causation, correlation and generalization. This diversification of methodology should also include longitudinal studies investigating the evolution of sustainable business models over time, comparative studies on the performance implications across different types and contexts of models, experimental or quasi-experimental designs that allow establishing

causal relations, and mixed-methods approaches that combine qualitative detail with quantitative robustness.

The "practice" is limited to a few sectors and countries, but this remaining literature target should be wider in terms of both empirical focus. Current research shows concentration in specific geographic areas, especially Europe and Asia – and sectors, like manufacturing and construction (Munaro et al., 2021). Future work should extend to underrepresented regions, including developing countries where sustainable business models may be subject to unique challenges and opportunities, and to sectors that have been comparatively less well-studied but exhibit considerable potential for environmental improvements as services, healthcare, and agriculture

6.2 Theoretical Development Needs

Advancing theory is an acute priority in the sustainable business model domain. Silvia et al. (2020) emphasized the necessity for comprehensive methodologies pertaining to sustainable value measurement and representation in models and frameworks as evidenced by the existing scarcity of unifying theoretical frameworks illustrated within social, economic and environmental paradigms. Future research must construct holistic frameworks that acknowledge the interdependencies between economic value, environmental value, and social value; take into account temporal dynamics and long-term versus short-term impact on value creation; encompass stakeholder views as well as approaches based on the diversity of capital types; and offer applied insights for valuation and management systems focused on sustainability.PNG

Palmié et al. (2024) poring over a detailed research agenda for digital-sustainable business models that has wider applicability to the sustainable business model domain. Future studies should investigate complementarities and conflicts between business model dimensions (value propositions, value creation and the delivery process, value capture mechanisms), between several options within each entity dimension, between different enabling technologies, among various organizational capabilities, and sustainability goals vs. other strategic priorities. These complementarities and conflicts need to be understood for the coherent, effective design of sustainable business models.

The literature also needs to pay more attention to antecedents and boundary conditions of sustainable business models. Palmié et al. (2024) acknowledged that research is warranted investigating the enablers and impediments that act toward or against the adoption of sustainable business models, how context influences sustainable business model design and performance, as well as what organizational capabilities and resources enable the implementation of successful sustainable business model. This focus on antecedents and boundary conditions would augment the field's ability to generate contingent theoretical propositions that %account for contextual variation%

6.3 Emerging Research Areas

There are many new emerging research themes to advance sustainable business model research and practice. Li et al. (2023) who noted that circular economy, renewable energy, value creation, and decarbonization emerged as important recent trends since 2019 and warrant closer attention from researchers. They are working on models for decarbonisation and business opportunities to address climate change actions and commitments, including the Paris Agreement -- a demand that takes time. Future research needs to consider how business models may be designed to enable deep decarbonization, the trade-offs between decarbonization and other sustainability goals as well as how carbon pricing and other policy instruments impact business model choices.

Another emerging frontier area is the coupling of sustainable business models with renewable energy systems. Given increasing cost-competitiveness of renewable energy technologies and expansion of policy support, business models that embed renewable energy in work towards competitive advantage and sustainability outcomes warrant exploration. These may include questions such as how integration

of renewable energy can impact propositions and mechanisms for value capture from business models, which innovations in business models enable the growth of distributed systems for renewable energy, or how storage and grid integration technologies create opportunities for new business model approaches. Sustainable business models in the particular context of social sustainability dimensions needs more attention. Research on sustainable business models has focused strongly on environmental sustainability, while social dimensions such as equity and inclusion, labor practices, and community impacts have been less systematically studied. Future research needs to examine how business models could be designed that create social value alongside environmental and economic value, what predominant tensions exist between sustainability objectives of different groups, and how stakeholder engagement mechanisms can ensure that sustainable business models operate in a manner consistent with the interests of marginalized communities.

Emerging technologies (other than digitalization) either expanding or collapsing sustainable business models. Kurek et al. (2023) pointed out as gaps in the literature on existing frameworks for innovation towards sustainability, advocating for studies of how new technologies such as artificial intelligence, blockchain, biotechnology, and nanotechnology can promote sustainable business model innovations While these technologies have the potential to improve resource efficiency and facilitate new forms of value creation, as well as provide new solutions to sustainability challenges, their integration with sustainable business models has been less explored.

7. Conclusion

This review of academic literature provides an overview, as well as insights on the evolution, state and future of sustainable business model research based on peer-reviewed papers published between 2010 to 2025. The review uncovers a field dominated by accelerated growth, sophistication and scope but also one that struggles with perennial issues such as methodological limitations, theoretical fragmentation and implementation challenges.

These sentences must be reformulated to summarize the state-of-the-art of sustainable business model research bringing out directions for future work. These trends are indicative of the field's responsiveness to emergent sustainability demands and its trajectory from theory toward practice. The emergence of circular business models as a separate and quickly growing subfield stands out in this regard, providing tangible means for reversing the degradation of nature through closed-loop systems, resource efficiency, and waste reduction.

Nevertheless, there are significant challenges for the field that must be met to achieve its potential. Methodological limitations, most notably the predominance of qualitative case studies and a dearth of quantitative research within the area of study constrain the field's capacity to produce generalizable findings and build an evidence base robust enough for practice. From a theoretical perspective, these challenges manifest in fragmentation across different scholarly perspectives and the absence of integrative frameworks for measuring and representing sustainable value in an encompassing fashion. Implementational issues are indicative of organisations' struggles to convert the theoretical concepts surrounding sustainable business models into practice, particularly things like organisational inertia, capability gaps and conflicts between sustainability goals and short-term financial profitability.

Future research directions suggest methodological diversification (e.g., increased use of quantitative and mixed-methods approaches); realization of theoretical advancement by development of integrative frameworks that capture complementarities among business model dimensions, as well as conflicts; broader empirical focus on underrepresented regions and sectors; exploration of emerging areas such as decarbonization, renewable energy integration, social sustainability dimensions, and the role of emerging technologies. These research priorities will take time, commitment from the scholarly community and cooperation across disciplines, along with engagement with practitioners and policy makers.

The field of sustainable business models is at a crucial moment. Sustainability issues like climate change, resource depletion and social inequality make it too pressing to not significantly advance both the knowledge of and action toward sustainable business models. At the same time, the field has matured sufficiently and developed enough knowledge that it is ready to move beyond exploratory research toward more developmentally rigorous theory testing, comparative analysis and evidence-based guidance for practice. Through overcoming methodological limitations, promoting theoretical integration, and investigating emerging research areas, the field will be able to fulfill its promise to advance both academic understanding and practical solutions for sustainability challenges.

For practitioners, this review reinforces the necessity of balancing holistic endeavours towards sustainable business model innovation through circular economy integration and strategic digital technology plays while moving beyond stakeholder engagement to sector multiplicity. Sustainable business model success is the aggregate outcome of aligned business model elements, organizational skills/resources, stakeholder support and enabling institutional arrangements. Do remember that sustainable business model innovation is more of an iterative process than just a one-time thing.

For policymakers, the review highlights that institutional support plays an important role in enabling the adoption and diffusion of sustainable business models. Policy interventions such as regulations that make businesses internalize environmental and social costs, support for the development of capabilities and knowledge-sharing, incentives for innovations to sustainable business models, and the generation of markets for sustainable products and services can accelerate this transition toward sustainable business models. Research in regions with a strong policy interest in both circular economy and sustainability are highly clustered geographically, indicating that the institutional context plays an important role in shaping sustainable business model development.

Overall, sustainable business models comprise a promising means for tackling current sustainability problems through radical change in the way firms create, deliver and capture value. The body of literature has made great strides in order for focus on sustainable business models to emerge, documenting experience with implementation, and outlining the major trends and challenges. But harnessing the full potential of sustainable business models calls for further research to fill existing methodological and theoretical voids, a broadening of empirical investigations into diverse contexts, and persistent collaboration between scholars, practitioners, and policymakers. The future of sustainable business models hold great potential, but the realization of that potential lies in collaborating across both the research community and wider stakeholder ecosystem to understand how best to advance knowledge and practice.

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