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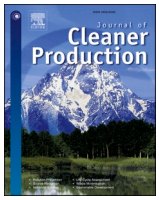

Unveiling the power of social value: Catalyzing circular economy in emerging market SMEs

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ABSTRACT

The circular economy serves as a dynamic force for sustainability, emphasizing energy conservation, enduring design, and recycling, all while prioritizing value creation. Aligned with the comprehensive triple bottom line framework, encompassing environmental, social, and financial dimensions, circular economy initiatives hold the promise of substantial organizational benefits. This research, deeply rooted in systems thinking, investigates the pivotal role of social value in achieving organizational objectives. Employing structural equation modeling, a serial mediation model is meticulously crafted based on a cross-sectional online survey conducted among small and medium-sized enterprises in Turkey. The findings bring to light mutually reinforcing relationships among triple bottom line dimensions, accentuating the positive mediating mechanisms between social value initiatives and organizational performance. This study significantly advances our understanding of social value, circular economy practices, and sustainability within the context of Turkish SMEs. The practical implications of this research provide valuable guidance for organizations navigating the realms of social and environmental responsibility. Through the implementation of diverse strategies, organizations can adeptly integrate and manage the multifaceted aspects of the triple bottom line, culminating in favorable outcomes and the cultivation of triumvirate elements that augment organizational performance.

1. Introduction

The evolution of organizational paradigms has transcended the narrow confines of economic value creation, as researchers have increasingly recognized the imperative of incorporating social value-added activities (e.g., European Commission, 2015; Kristensen et al., 2021; Pieroni et al., 2019; Shrivastava, 1995). These activities often manifest in initiatives such as corporate social responsibility (CSR), advocacy for human rights, and commitment to social justice. When social values are integrated into business practices, they can significantly enhance a company's overall value. This paradigm shift not only generates economic benefits but also contributes positively to the broader societal and environmental landscape (Atanasovska et al., 2022). Value creation in the context of small and medium-sized enterprises (SMEs), particularly in emerging contexts, requires a delicate balance between generating internal revenue and addressing a broad spectrum of social issues. For instance, in the fashion industry, brands adopt closed-loop systems where garments are designed for longevity, easy repair, and eventual recycling (Khandelwal et al., 2023). This approach creates jobs in repair and recycling sectors and educates consumers on sustainable practices. Bals et al. (2023) emphasize that when businesses, especially small ones, integrate social values into their practices, they can significantly enhance their overall value. This integration goes beyond ethical practices; it is about ensuring sustainable business models that can support and uplift local communities. Furthermore, as Osorio-Vega (2019) points out, if small businesses overly prioritize profits at the expense of social outcomes, it can undermine the normative grounding and lead to both direct and indirect adverse effects on these communities. Therefore, businesses need to develop capabilities and engage with stakeholders in a manner that balances revenue generation with broader social responsibility towards the communities they impact. In this context, initiatives centered around the circular economy (CE) have emerged as a potent avenue for fostering social value (Bocken et al., 2016; Geissdoerfer et al., 2017),

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thereby harmonizing with the triple bottom line (TBL) framework that encompasses environmental, social, and financial dimensions of sustainability (Kumar and Anbanandam, 2020; Padilla-Rivera et al., 2020).

As CE initiatives (CEI) become more integrated into organizational practices, their potential for transformative change is highlighted, especially in response to resource scarcity and environmental concerns that necessitate a shift toward recycling, reusing, and reimagining traditional business models (Barón Dorado et al., 2022). An illustrative example is observed in the automotive industry, where the CE is transitioning from merely selling cars to providing mobility services. This transformation involves the use of shared, electric, and connected vehicles to reduce environmental impact, alleviate traffic congestion, and lower pollution levels (Autovista24, 2022). Thus, CEI adopts a holistic approach to sustainability that extends beyond conventional business operations. It encompasses cleaner production methods, a shift towards renewable energy and materials, the elimination of toxic substances and waste, and an amplification of responsibility among both producers and consumers (Kirchherr et al., 2017). Ghisellini et al. (2016) further elaborate on these practices, emphasizing the shift towards a more sustainable, closed-loop system where resource use is optimized, and environmental impact is minimized. CEI represents a comprehensive framework for sustainable business practices, aiming to strike a balance between economic development and environmental preservation while fostering responsible consumption and production. However, despite the alignment between CEI and sustainability goals, complexities arise in understanding how the creation of social value interacts with organizational capabilities and mechanisms to yield favorable outcomes. While the literature has explored linkages between economic and social value (McWilliams and Siegel, 2001), the intricate pathways that connect social value, CEI, and organizational performance deserve deeper investigation (Okorie et al., 2021).

Social initiatives across diverse areas of sustainability have engendered a multitude of studies with varying foci. These studies include examinations of emphasized aspects such as purchasing and supply chain management (Maignan et al., 2002), consumer interest in sustainability (Chatzidakis and Shaw, 2018), and the impact of lean management practices on sustainability-oriented innovation (Dey et al., 2020a). Furthermore, attention has shifted toward emerging and developing countries, characterized by a sizable bottom-of-the-pyramid population that endures the most unsustainable production practices (Huq et al., 2016). The resultant effects include instances of slavery (Gold et al., 2015), interrelationships within board sustainability committees, process-based climate change initiatives (Orazalin et al., 2023), and the application of the public value model to unearth insights about the barriers and preconditions for organizational transitions within a wider institutional context (van Gestel et al., 2023).

This complex landscape within the TBL dimensions, particularly the role of social value, necessitates a comprehensive approach that unravels their systemic interplay and interdependencies. However, a dearth of research addressing holistic understanding of TBL components, and their interactions underscores this complexity (Schneider and Meins, 2012; Smart et al., 2017; Walker et al., 2014). Despite the exploration of various sustainability dimensions, insights into how social elements intertwine within the CE context remain limited (Geissdoerfer et al., 2017). This knowledge gap impedes the establishment of a systematic theory that integrates TBL dimensions, influencing decision-making strategies for sustainability improvements (Gino and Pisano, 2008).

To address these challenges, the adoption of a systems thinking view (STV) becomes imperative in untangling the intricate relationships underlying TBL dimensions. STV equips firms with collective skills to identify and understand systems, predict their actions, and suggest necessary changes (Arnold and Wade, 2015). This perspective empowers a comprehensive analysis of how social, environmental, and financial factors interrelate, thereby facilitating the achievement of sustainable outcomes (Levy and Lichtenstein, 2011).

In light of STV, this study introduces a serial mediation model that establishes a robust framework to probe the mediating mechanisms connecting social value initiatives, CEI, and organizational performance. This paper contributes significantly to existing literature on several fronts. Primarily, it enriches our understanding of the relationship between social and economic value by adopting a holistic approach that considers the interplay between social, environmental, and financial aspects (Mazzucchelli et al., 2022). Unlike conventional analyses that often view social and economic value through institutional pressures or stakeholder theory, this research provides a nuanced exploration.

Furthermore, this study delves into the role of CEI in achieving economic solutions, particularly in the realm of resource management and waste reduction (Barnabè and Nazir, 2022). This facet bridges the gap between financial outcomes and sustainable initiatives, offering insights into an area marked by inconclusive findings. Beyond these contributions, the research adds unique value to the SMEs literature by uncovering the readiness and propensity of SMEs to engage in social actions that enhance economic value (Prieto-Sandoval et al., 2019). The context of Turkey, a representative emerging market, magnifies the findings' applicability beyond predominantly developed-country settings. By examining Turkish SMEs across diverse industries, the study captures the dynamics of social value creation within an environment brimming with challenges and opportunities.

Turkey's strategic position at the crossroads of Europe and Asia further enriches the study's implications, shedding light on regional and international influences shaping the adoption of circular economy strategies and social value creation. As Turkey seeks to balance economic growth with environmental consciousness, understanding how its SMEs embrace sustainability assumes pivotal importance for shaping policies and international collaborations aimed at global sustainable development goals.

This research primarily aims to: (1) examine how social value initiatives (SVI) within SMEs in emerging markets, particularly Turkey, contribute to the natural environment through the adoption of CEI and enhancements in operational effectiveness; and (2) bridge the existing literature gap by providing a deeper understanding of the integration of social value within the CE context and its impact on economic value. By adopting a systems thinking approach, this study seeks to offer a holistic analysis of these interrelated sustainability dimensions.

In essence, this study's narrative extends beyond conventional organizational theory, venturing into the intricate landscape of emerging markets. It underscores the pivotal role SMEs play in steering sustainability trajectories despite contextual nuances. By exploring the interplay between social value, CE practices, and organizational performance within this dynamic context, the research resonates with scholars, practitioners, and policymakers seeking comprehensive insights to foster sustainability-driven growth in diverse economies.

In the subsequent sections of this study, we embark on a comprehensive exploration of the relationship between CEI, SVI, and TBL outcomes in SMEs. Section 2 reviews pertinent literature, establishing the theoretical foundation for our study. Following that, Section 3 presents the hypothesis development. Section 4 outlines our research methodology, elucidating the survey design and data collection process. Section 5 presents empirical findings, while Section 6 discusses these results with implications in the context of existing literature. The study concludes in Section 7, summarizing key insights and contributions.

2. Literature review

2.1. Aligning systems thinking view with the TBL in SMEs

The STV stands on a pivotal premise that individual components within a system manifest distinct behavior when isolated, making separate management infeasible (Weinberg, 1975). Integrating the TBL and CE into the STV framework offers the promise of positively shaping

broader outcomes and relationships –specifically, stakeholder relations, public perception, and their ripple effects on company shares and profitability (Asif et al., 2013).

Placing emphasis on CEI holds potential for accentuating economic benefits through resource usage reduction, waste minimization, and enhanced efficiency gains (Geissdoerfer et al., 2017). Additionally, For SMEs, sustainability regulations are increasingly relevant. Key UK regulations include Environmental Permitting Regulations, Waste Regulations, Packaging Waste Regulations, Energy Performance of Buildings Regulations, Wildlife and Countryside Act, Water Resources Act, and the UK Emission Trading Scheme (Hannay, 2023). Also, the Corporate Sustainability Reporting Directive (CSRD) and the Sustainable Finance Disclosure Regulation (SFDR) are new regulations that might impact SMEs, especially those interacting with EU markets (Berrios-Silletti, 2022). SMEs are encouraged to develop sustainability strategies, understand applicable regulations, and track their sustainability performance. Therefore, there is a need for novel business models fostering supply chains that can recover or recycle resources (Lahane et al., 2020; Tan et al., 2022). The integration of CEI with the social and financial dimensions of the TBL can provide a more comprehensive perspective on creating stakeholder value (Ghisellini et al., 2016). CEI encompasses resource and input usage savings that result in efficiency gains and waste reduction (Barquet et al., 2013; Elkington, 1998). Notably, the present literature underscores the need for further empirical research to adapt the TBL into CEI contexts (Lüdeke-Freund et al., 2019).

Designing CEI involves orchestrating processes that efficiently convert inputs into desired outputs, aligning with the concept of operational excellence (Sodhi, 2015). Geissdoerfer et al. (2017) draw attention to the ascent of CE as a transformative philosophy, resonating across micro (enterprises), meso (regions), and macro (national) levels. CE's departure from the linear supply chain model, opting for a circular approach (take, make, distribute, use, recover), pursues sustainability through optimized resource utilization and waste reduction.

As natural resource scarcity intensifies, organizations must mitigate risks tied to resources, constructing resource-efficient structures by embracing STV (Kalaitzi et al., 2019). While ensuring stable economic conditions for firm survival, such as net working capital and revenue focus, remains imperative, their role within the TBL often receives scant attention due to their short-term nature (Slawinski and Bansal, 2015). In contrast, dimensions rooted in the social and natural environment –like green packaging, waste reduction, clean water, and social well-being investments– receive greater focus in defining the TBL due to their relational and long-term significance (Hahn et al., 2014). The intricate web of relationships within the TBL can be illuminated through approaches like STV, supporting diverse stages of environmental, social, and financial processes (Foss and Saebi, 2017).

Infusing the intricate STV into the complex TBL concept requires transitioning from a hierarchical structure to a panarchy –a hierarchy of interconnected systems with ongoing adaptive cycles of growth, change, and restructuring (Holling, 2001). Essentially, this complexity evolves into a system composed of interdependent subsystems. The TBL can be conceived as a system encompassing value capture, delivery, and adoption through subsystems (Foss and Saebi, 2017). Holling (2001) furnishes a framework urging STV in a manner that achieves a systemic TBL. This framework assesses information from internal factors and external influences, guided by criteria of being easily comprehensible and communicable, dynamically prescriptive across all periods, and adaptable to uncertainties, thereby embracing change. Ultimately, flexibility emerges as the cornerstone for seizing opportunities to sustain the TBL within any system.

Derived from the arguments of Senge (1990), Anderson and Johnson (1997), Holling (2001), and Foss and Saebi (2017), the facets of STV encompass (a) balancing short-term and long-term perspectives, (b) recognizing dynamic, complex, and interconnected relationships among systems, (c) accommodating both measurable and immeasurable influences, (d) engaging with the broader picture, acknowledging a collective purpose and interconnectedness of all components, and (e) being straightforward, dynamic, and spontaneously adaptable to all aspects, ultimately achieving comprehensive flexibility. Successfully integrating disparate systems necessitates stakeholders at all levels, from individuals to society, embracing a TBL mindset and translating this into actionable flexibility through stakeholder interactions (Starik and Rands, 1995).

2.2. The role of social value creation in building organizational performance

Social value is defined by the provision of essential goods and services aimed at societal betterment, encompassing activities like fostering community growth, championing equitable policies, and addressing various social issues (Austin et al., 2006; Murphy et al., 2011). Generally, managers lack expertise in evaluating social values and integrating them into ecological decision-making processes (Ives and Kendal, 2014). Therefore, creating shared value might offer a stronger basis compared to the traditional, philanthropy-focused CSR for generating beneficial impacts (Hong et al., 2023; Khurshid and Snell, 2021).

In the context of SMEs, social value creation plays a pivotal role in enhancing organizational performance. Key drivers of this social value include an understanding of the local context and problems, embeddedness within the community, and establishing strong consumer loyalty, particularly with emerging and underdeveloped contexts (Bals et al., 2023). Central to this inquiry is the understanding that different consumer segments prioritize varying values (Caniëls et al., 2021). However, a common thread across these segments is the importance of social bonding and the desire for group belonging. This social dynamic significantly drives consumer attitudes and behaviors (Grazzini et al., 2021; Griskevicius et al., 2010). For example, Sindhwani et al. (2022) indicated that the focus of social value creation is on developing collaborative approaches rather than just relying on green technologies or straightforward tech solutions. This collaborative approach is crucial in achieving the goals of the net-zero initiative, as it involves joint efforts in innovation that consider a wider range of environmental and societal factors. Hence, these arguments collectively underscore the importance of social value creation as a strategy for SMEs to enhance their organizational performance. The focus on understanding local needs, embedding within communities, fostering social bonds, and aligning with environmentally conscious values are all integral to this approach. This holistic perspective demonstrates how social value creation is not just beneficial for community welfare but also a strategic imperative for SMEs in achieving business success and operational efficiency.

2.3. The relationship between TBL and CEI in SMEs

SMEs form the backbone of economies worldwide, making substantial contributions to economic development while also playing a pivotal role in environmental and social well-being (The World Bank, 2022). Their commitment to sustainability has the potential to elevate communities, enhance livelihoods, and foster prosperity. Despite their inherent limitations due to their smaller scale (Aldrich and Auster, 1986; Hymer, 1976), SMEs are progressively recognized as essential agents of sustainable development (Klewitz and Hansen, 2014). Nevertheless, there remains a notable research gap in the context of SMEs (Williams and Schaefer, 2013).

A review of the current body of research reveals a focus on identifying the antecedents of the TBL within the SME context. For instance, Williams and Schaefer (2013) established that managerial beliefs and personal values drive engagement with climate change and environmental issues among SMEs in the UK. Similarly, Roxas and Coetzer (2012) explored the interplay between institutional environment, managerial attitudes, and environmental sustainability orientation among SMEs in the Philippines. Their findings highlighted the mediating role of managerial attitudes in the relationship between institutional

environmental sustainability orientation and SMEs' actions. A study involving Swedish SMEs conducted by Jansson et al. (2017) validated the impact of market orientation, entrepreneurial orientation, and sustainability practices on firms' commitment to sustainability. Various studies have also investigated the correlation between corporate sustainability and economic performance, yielding fragmented and occasionally contradictory outcomes. For instance, Malesios et al. (2018) identified a positive link between specific sustainability practices and SME financial performance. However, while certain practices positively impacted turnover, their effects on other performance aspects were either insignificant or negative. Conversely, Boakye et al. (2020) reported a non-linear (concave) relationship between sustainable environmental practices and financial performance among UK SMEs. Notably, Zeng et al. (2011) demonstrated that SMEs with varying pollution levels displayed divergent associations between environmental management and economic performance. Given the lack of consensus across previous studies, further research is imperative to clarify the intricate interaction between sustainability and economic dimensions. Furthermore, despite the vital role of the CE in advancing the TBL, only a scant number of studies address this relationship within the SME context (Dey et al., 2020b; Marrucci et al., 2022). To deepen our understanding of the connection between TBL and economic performance in SMEs, it is essential to elucidate the interplay between crucial constructs, such as social and environmental initiatives, the CE approach, operational performance, and financial outcomes.

In response to the evolving discourse on sustainable business practices, particularly within SMEs, we have compiled a comprehensive table summarizing key recent studies, presented as Appendix 1. This table encapsulates significant research published from 2020 to 2023, offering insights into the intricate relationship between the TBL and CEI in SMEs. It serves as an essential resource for understanding the state-of-the-art innovativeness in this field, illustrating various methodologies, key findings, and the practical implications of these studies.

3. Hypothesis development

The theoretical underpinnings of this study are rooted in STV, which posits that understanding the interconnections within organizational processes is crucial for effective management (Anderson and Johnson, 1997; Holling, 2001; Schlüter et al., 2023; Williams et al., 2017). This perspective is essential in hypothesizing that organizations with a strong system thinking approach are likely to have more sustainable practices, as it enables a holistic understanding of the environmental, social, and economic impacts of business decisions (León and Calvo-Amodio, 2017; Senge and Sterman, 1992). Inspired by Amoako-Gyampah et al. (2020) we integrate STV as a theoretical base to sustainability initiatives to underpin our study. STV will provide a solid foundation for understanding the complex interplay between organizational processes and sustainable practices.

In contrast to the economic dimension, the social and natural environment dimensions of the TBL encompass humanitarian perspectives, such as poverty and equality, as well as access to vital resources like clean water and healthcare. These dimensions also encompass environmental contexts such as global warming, efficient energy and resource usage, and pollution (Kiron et al., 2013; Roca and Searcy, 2012). Unmeasurable influences of the TBL, notably social sustainability, pose complexities surpassing measurable dimensions with robust performance indicators such as increased cash flow, profits, greenhouse gas emissions, and waste volumes (Banerjee, 2011). Therefore, the critical role of STV in managing knowledge becomes evident, as they not only aid in efficiently utilizing knowledge for economic gains but also in navigating the subjective and complex aspects of social sustainability and environmental concerns (Guo et al., 2022).

CEI is grounded in ecologically sustainable performance indicators that span diverse outcomes, including waste management, packaging, supplier relations, distribution, raw materials, and energy use (Lewandowski, 2016; Mhatre et al., 2021; Planing, 2015). Stakeholder integration capability has emerged as a pivotal precursor for firms striving to craft robust TBL strategies (Rueda-Manzanares et al., 2008; Tang and Tang, 2018). To foster a value-generation mindset, the environmental facet of the TBL must transcend cost reduction, instead intensifying efficiency by embracing multiple stakeholders, the natural environment, and society (Barnabè and Nazir, 2022). This necessitates a mindset aligned with the long-term implementation of initiatives in line with the STV. This long-term, integrative approach requires adopting STV in knowledge management, where the meaningful utility of knowledge in environmental sustainability is realized through systematic application and conscious leveraging of STV, aligning organizational behavior with ethical values, societal needs, and environmental considerations (Guo et al., 2022).

The inclination towards a social and environmental value-generation mindset is increasingly evident among major corporations (Mazzucchelli et al., 2022). Noteworthy instances include Starbucks, Disney, and Apple, which have incorporated new environmental and workplace targets such as eliminating plastic, reducing hazardous materials, and enhancing minority employee retention in their compensation structures (Brennan, 2022; La Roche, 2020). Conversely, stakeholders across various domains – customers, NGOs, and the press – are increasingly vigilant about unsubstantiated environmental claims, known as greenwashing. This deceptive practice involves projecting an environmentally conscious image without substantial substantive changes or actions Mundy (2022); Effective January 2022, EU countries mandate climate objective and funding taxonomy reporting for large and stock exchange-listed corporations, with similar requirements being extended to SMEs by 2024 (Reistad, 2021).

An instrumental strategy for enhancing the long-term viability of the TBL involves the integration of CE incentives into business models and operations (Lüdeke-Freund et al., 2019). CEI contributes to product value by mitigating environmental impacts, achieved through judicious resource usage and the reduction of toxic materials during production (Figge et al., 2014). Moreover, CEI addresses environmental outcomes, facilitating the inclusion of national, regional, and local stakeholders, thereby fostering a collective comprehension of the CE concept woven into operational frameworks (Tapaninaho and Heikkinen, 2022). For instance, car manufacturers strive to reduce emissions during driving, concurrently promoting the utilization of recycled materials (Hannon et al., 2020). While the primary focus of CE business models, center on economic and environmental dimensions, these practices extend to crucial social aspects such as stakeholder interaction, management practices, diversity, and employment (Chiu et al., 2015). As these CE practices highlight the importance of multi-faceted stakeholder engagement and environmental stewardship, they align closely with STV, which emphasizes understanding organizational processes as interconnected and interdependent components, thereby promoting a holistic approach to sustainability (Maon et al., 2008).

Building upon these foundations, this study hypothesizes that social value initiatives serve as the cornerstone for achieving operational effectiveness and economic value creation through CEI.

H1a. *Circular economy initiatives mediate the relationship between social value initiatives and economic value creation.*

H1b. *Circular economy initiatives mediate the relationship between social value initiatives and operational effectiveness.*

The firm's array of resources and capabilities, encompassing technology, management skills, knowledge, information, learning, stakeholder management, and environmental capabilities, collectively form dynamic capabilities (Hart, 1995; Hart and Dowell, 2011; Russo and Fouts, 1997; Sharma and Vredenburg, 1998). These dynamic capabilities empower firms to develop robust environmental and social strategies while achieving operational effectiveness and efficiency. By curtailing costs, enhancing reputation, and strategically aligning with

shifting business landscapes, firms can harness their capabilities to address environmental and social challenges (Chaudhuri et al., 2022; Hart, 1995; Sharma and Vredenburg, 1998). As mounting evidence underscores the urgency of addressing global warming, ozone depletion, climate change, and biodiversity loss, coupled with growing concerns about human rights, food scarcity, and inequality, the importance of environmental management practices and social initiatives has intensified in firms' strategic pursuits (Hofer et al., 2012; Yu and Ramanathan, 2015).

In response, businesses are increasingly embracing green management as an integral part of their strategies, recognizing the synergistic effects that such integration can have on CEI and addressing stakeholder pressures (Yu and Ramanathan, 2015). By infusing environmental management and social initiatives into their business strategies, companies can address sustainability concerns and craft operational performance indicators that align with CEI (Bocken et al., 2015). For instance, the practice of re-manufacturing, involving the recovery of unused or outdated products without the need for new materials, has gained prominence among original manufacturers (Reim et al., 2021). In some jurisdictions, re-manufacturing has even evolved into a legal requirement (Dickson, 2021). In this context, adopting STV is crucial for organizations, as it enables a holistic approach to managing these dynamic capabilities, ensuring that environmental and social strategies are seamlessly integrated into the broader organizational system (Maon et al., 2008) and knowledge management (Gao et al., 2002) aligning with both internal and external stakeholder needs and expectations.

Given this contextual framework, the following hypothesis is formulated.

H2a. *Operational effectiveness mediates the relationship between social value initiatives and economic value creation.*

On the other hand, certain authors contend that environmental management practices are inherently geared towards fostering positive long-term financial outcomes (Jennings and Zandbergen, 1995; Porter and van Der Linde, 1995a, 1995b; Shrivastava, 1995). However, the challenges posed by resource scarcity, competition, and the need to reconcile divergent stakeholder demands create significant obstacles for organizations striving to implement environmentally and socially responsible initiatives while simultaneously achieving favorable financial outcomes (Tapaninaho and Heikkinen, 2022). Hence, incorporating CEI and its fundamental principles—spanning resource efficiency, waste minimization, sustainable product design, the transition to renewable energy sources, the adoption of cleaner production methods, incorporation of recycling and reuse strategies, and promotion of responsible consumption—into organizational strategies is indicative of foundational operational concepts in alignment with the TBL framework (Egan, 2019). This entails fostering the capacity to attract investments that support environmental protection, address societal concerns, generate a growing profit pool allocated for environmental and social projects, and draw new talent to the organization.

The relationship between internal factors, such as employees and production processes, and external dynamics, including stakeholder expectations and government requirements, adds complexity to organizations (Bocken et al., 2015). These factors operate in a nonlinear manner, often intertwined with feedback mechanisms and causal relationships. Moreover, changes originating from macro-level shifts have restructured organizations and institutions, evolving them into diverse, interconnected systems that share a common meaning system (Murphy et al., 2021). In light of this context, it is logical to anticipate that the significance of economic value within the TBL could be influenced by the dimensions of operational effectiveness. Using STV, this progression leads to the formulation of the following hypothesis.

H2b. *Operational effectiveness mediates the relationship between circular economy initiatives and economic value creation.*

Numerous organizations navigate the complexities of aligning TBL objectives with their operational strategies, often grappling with uncertainties arising from diverse stakeholder requirements (Brockhaus et al., 2019; Wright and Nyberg, 2017). These uncertainties emanate from the intricate interconnections inherent in the TBL framework, necessitating consistent engagement with stakeholders across various organizational levels (Keeble et al., 2003; Maon et al., 2008). Effectively linking social value initiatives to both environmental and financial performance requires the cultivation of specific capabilities, including effective stakeholder management, knowledge sharing, and risk reduction (Hahn et al., 2014; Klassen and Vereecke, 2012; Wu and Pagell, 2011). In this way, hard (technological, operational) and soft (ethical values, managerial philosophy) systems within sustainability management align with STV's emphasis on understanding the dynamic interplay between tangible operational processes and intangible social dynamics, crucial for aligning TBL objectives (Chaker et al., 2021).

Amidst the challenge of operationalizing TBL goals and translating them into actionable strategies, the emergence of CEI provides comprehensive and applicable guidelines for simultaneously addressing environmental and economic aspects (Barón Dorado et al., 2022; European Commission, 2014). Operational effectiveness, on the other hand, hinges on factors such as energy consumption, resource optimization, and design proficiency, intrinsically linked with sustainability and CEI (De los Rios and Charnley, 2017; Dey et al., 2020b; Yusuf et al., 2013). STV in sustainability management involves recognizing emergent patterns and feedback loops, resonating with STV's approach to understanding complex, nonlinear interactions within organizational strategies and TBL objectives (Williams et al., 2017). Companies striving to harness the benefits of STV often intertwine operational and environmental milestones within their performance metrics, creating a harmonious alignment that reinforces the TBL (Longoni and Cagliano, 2015; Miemczyk and Luzzini, 2018).

This alignment is particularly evident in instances where companies simultaneously prioritize social and environmental standards, amplifying the specificity of environmental standards and embracing a holistic TBL perspective that encompasses the social dimension (Miemczyk and Luzzini, 2018). However, for the full realization of economic benefits driven by CEI-related performance indicators, the organization's capacity to integrate diverse stakeholder concerns related to strategic environmental matters is pivotal (Rueda-Manzanares et al., 2008). This integration of stakeholder concerns functions as a bridge, connecting CEI, operational effectiveness, and the broader process of economic value creation.

Structural understanding of organizational-environmental interactions complements STV by emphasizing the adaptive responses and feedback mechanisms essential for the effective mediation of social value initiatives and economic outcomes within the CEI framework (Chaker et al., 2021). The dynamic interplay between CEI and operational effectiveness, spurred by stakeholder engagement and strategic environmental considerations, serves as the foundational basis for formulating our study's final hypothesis, proposing that CEI and operational effectiveness work in tandem to serially mediate the relationship between social value initiatives and economic value creation. This sequential mediation mechanism captures the intricate connections and dependencies that underlie the path from social value initiatives to tangible economic outcomes, underlining the multifaceted nature of value creation within a sustainability-focused framework.

H3. *Circular economy initiatives and operational effectiveness serially mediate the relationship between social value initiatives and economic value creation.*

Incorporating the insights obtained from the comprehensive literature review and the established hypotheses, we have constructed the conceptual model illustrated in Fig. 1.

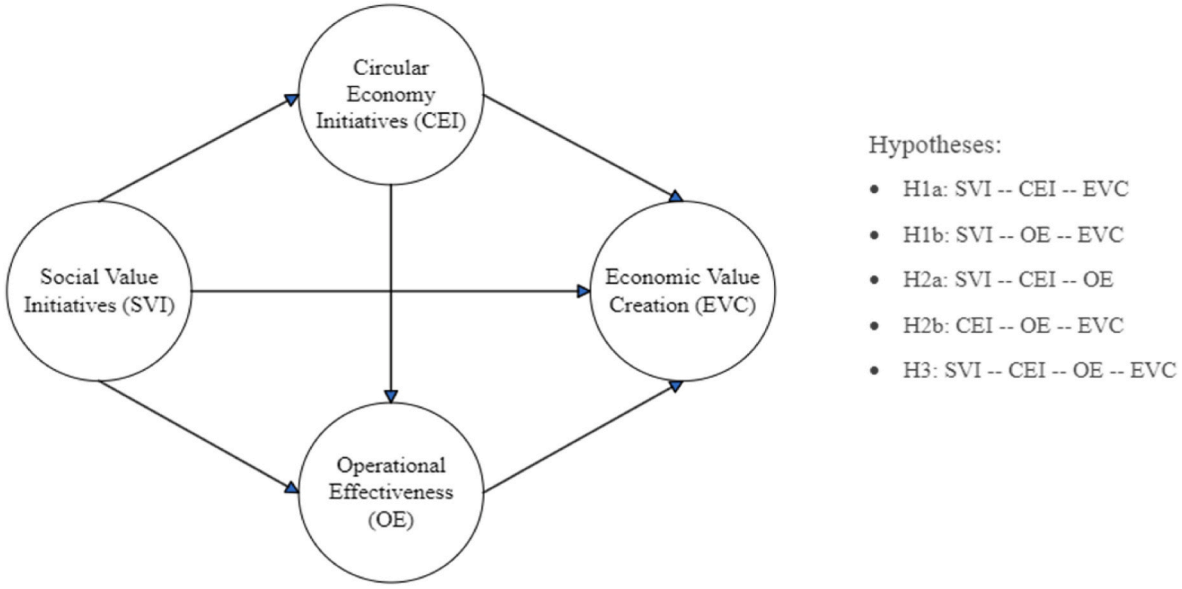

Fig. 1. Conceptual model.
**$p<.01$.

4. Research methodology

4.1. The survey setting

The survey methodology employed in this study utilizes a carefully designed single respondent online survey, deploying a questionnaire distributed among SMEs in Turkey, specifically within the dynamic Marmara Region. Our selection of a survey-based approach is grounded in its efficacy for capturing rich empirical data directly from organizational stakeholders. The questionnaire is meticulously structured to assess key variables, aligning with established theoretical frameworks, and capturing nuanced insights into the adoption of CE practices, the integration of SVI, and their impact on operational effectiveness and overall sustainability performance.

This survey methodology serves as a crucial tool for gathering real-world perspectives and practices within SMEs, significantly contributing to the contextual richness of our study. Our approach aims to address existing literature gaps by intricately exploring the integration of social and environmental considerations within SMEs, particularly in the distinctive context of Turkey's emerging market.

The choice of Turkey as the geographical focus is deliberate, given its status as an emerging market with a burgeoning SME sector. Turkey's economic landscape presents unique challenges and opportunities, rendering it an ideal context for investigating the integration of circular economy principles, social value, and sustainability practices within SMEs (Bougerra et al., 2023; Tatoglu et al., 2020). The cultural, economic, and regulatory nuances of the Turkish business environment enrich our dataset, enabling a more context-specific and applicable study.

The strategic selection of the Marmara Region further enhances the study's representativeness and economic significance. Encompassing key cities such as Istanbul, Bursa, and Tekirdag, the region serves as an industrial hub hosting a substantial number of production companies (Tatoglu et al., 2015). Its diverse industrial composition facilitates capturing a broad spectrum of perspectives from SMEs engaged in various sectors. Additionally, the region's strategic location enables a nuanced exploration of challenges, practices, and outcomes related to circular economy initiatives, social value integration, and sustainability performance.

4.2. Sample and data collection

The data collection process was orchestrated through the implementation of a robust online survey, fortified by a rigorously pre-tested survey instrument to ascertain its pertinence and efficacy. This approach ensured the reliability and accuracy of the collected data. Our survey specifically targeted owner-managers of Turkish companies.

Data collection was conducted from March to April 2022, encompassing various key cities in the Marmara Region, such as Istanbul, Bursa, and Tekirdag. A random sampling technique was employed to select 1000 firms from the Istanbul Chamber of Industry members' database. Selected firms received email invitations, inviting participation from managers well-versed in their firm's performance indicators. Following the guidance of Baruch and Holtom (2008) and emphasizing the importance of representativeness over a specific response rate, an initial 220 firms responded positively. After one reminder, a total of 210 responses were collected and deemed suitable for analysis. Given the relatively low percentage of missing data, instances of missing data for variables were addressed by substituting them with the mean value, a widely employed technique in multivariate analysis (Hair et al., 2010). Among these valid responses, 123 were identified as SMEs, in line with the official Turkish SME definition, which classifies firms with fewer than 250 employees and revenues/net sales not exceeding 125 million Turkish Lira as SMEs. This approach is underscored by scholarly literature, as various researchers emphasize the robustness of government-defined SME criteria for sample selection in empirical studies (Amara et al., 2008; Barba-Sánchez and Atienza-Sahuquillo, 2018). Adhering to the official criteria enhances the study's applicability and facilitates comparability with existing research in the field (Niskanen et al., 2018).

Our decision to exclusively focus on SMEs within the master sample is anchored in the specific research agenda of this study. By concentrating on SMEs, our research aims to delve into the distinct strategic practices, challenges, and outcomes prevalent in this sector. This methodological focus, widely endorsed in academia (Fornell and Larcker, 1981; Schultz and Block, 1986), affords us the opportunity to intricately explore the idiosyncrasies of a specific segment. Moreover, this approach precisely aligns with our research questions and objectives. As our emphasis is on exploring performance indicators within the SME context, narrowing our sample to this segment enhances the precision and relevance of our findings. This focused analysis not only

uncovers insights directly applicable to SMEs but also contributes to advancing academic comprehension of their strategic practices.

Among the responding managers in our sample, the majority were owner-managers (56.5%), while the remaining respondents included general managers (29.5%) and managers overseeing various operations such as manufacturing, marketing, and supply chain management (14%). The prevalence of owner-managers, who serve as both leaders and primary decision-makers in SMEs, is noteworthy. Their influence extends to shaping organizational practices in alignment with personal beliefs and values, making them ideal respondents for addressing our research questions (Spence, 2016; Spence and Rutherfoord, 2003). The expertise of these owner-managers, combined with their significant impact on SME outcomes, solidifies their pivotal role as key respondents (Miemczyk and Luzzini, 2018; Montabon et al., 2018).

The sectors of operation among our sample firms exhibit a diverse distribution, encompassing a wide spectrum of industries. These sectors include "metal, wood, leather, and glass" (22.7%), "food, chemical, and pharmaceuticals" (22.0%), "textile and paper" (17.9%), "industrial, automotive, and electrical equipment" (8.9%), "machinery and equipment" (15.5%), "wholesale and retail trade" (5.7%) and "other manufacturing" (7.3%). This diverse array of sectoral characteristics within our sample provides a comprehensive depiction of the demographic landscape prevalent in the Marmara Region.

4.3. Measurement of variables

Five-point Likert scales (i.e., 1 = "strongly disagree" to 5 = "strongly agree") were utilized to measure the constructs.

Dependent variable: The economic value creation (EVC) was adapted from earlier studies (Boyd, 1991; Dess and Robinson Jr, 1984; Li et al., 2009; Venkatraman and Ramanujam, 1986) and respondents were asked to categorize their firms' performance for the past three years compared to their main competitors on each of these six financial performance measures: (1) growth in revenue, (2) growth in sales, (3) growth in market share, (4) growth in operational profit, (5) growth of cash flow from operations, and (6) decrease in general costs.

Independent variable: Social value initiatives (SVI) were drawn from prior literature focused on stakeholder responses to corporate social performance (Clarkson, 1995) and social responsiveness for the assessment of natural environmental considerations (Wood, 1991). This measurement scale consists of seven items and captures the firm's social performance across the following dimensions: (1) enhancement of overall stakeholder and investor welfare, (2) contribution to community health and safety, (3) mitigation of environmental impacts and risks, (4) advancement in occupational health and safety processes, (5) heightened awareness of protecting the rights and interests of the local community, (6) progress in conceptualizing and executing social responsibility projects, and (7) effectiveness of communication with society.

Mediator variables: CEI was assessed using items adopted from previous studies (Accenture, 2014; Andersen, 2007; González-Benito and González-Benito, 2005), resulting in a nine-item scale. These items gauge the extent to which firms embrace circular economy practices across the following dimensions: (1) reducing energy consumption, (2) using recycled components, (3) making products easily recyclable, (4) using clean technologies and equipment, (5) improving a firm's reputation with the adoption of EM, (6) the reducing waste within the production process, (7) having better environmental proactivity in comparison with its competitors in the industry, (8) reducing toxic waste, and (9) reducing emission rates.

Operational effectiveness (OE) was measured through the utilization of seven items drawn from prior research (Boyd, 1991; Li et al., 2009; Rao, 2006; Venkatraman and Ramanujam, 1986). The firms responded to the questionnaire evaluate the extent of their operational effectiveness over the past three years compared to their rivals on the following measures: (1) the firm's overall competitive standing in the industry, (2) the overall performance of the firm's supply chain, (3) the decrease in employee turnover, (4) improvement in the firm's capacity for developing new products and services, (5) improvement in the capabilities for new product and service development, and (6) alignment of new product/service development processes with customer preferences and needs.

4.4. Common method variance (CMV)

To address potential CMV, we conducted two main statistical procedures. First, Harman's single-factor test was performed by exploring the variance explained by a single factor in exploratory factor analysis (EFA), a technique used to determine whether a single factor could account for a significant portion of variance across the entire model (Andersson and Bateman, 1997; Organ and Greene, 1981). The results revealed that the single factor accounted for an acceptable amount of variance (38%), thereby alleviating concerns about CMV. Additionally, we employed confirmatory factor analysis (CFA) to test Harman's single-factor model. This approach involves assigning all variables to a single latent factor, which helps discern if the study's design introduces bias (Malhotra et al., 2006; Podsakoff, 2003). The results of the single-factor fit indices in the CFA [(χ^2 (354) = 976.8; χ^2/df = 5.3; AGFI=.47; RMR=.12)] indicated that CMV is not the primary driver of variations in our model.

As a secondary procedure, we conducted the common latent factor (CLF) test, a method designed to identify and understand the potential influence of CMV (Richardson et al., 2009; Williams and Schaefer, 2013). The results of this test revealed that the shared variance between the marker variable and other constructs was calculated as 36%. This outcome suggests that CMV is not a significant concern within our sample set.

5. Analyses and results

Before delving into testing the conceptual model, we conducted preliminary assessments aimed at preventing data-related errors that could potentially impact the outcomes. These initial steps included subjecting all items to tests for normality skewness (−1.11 to -.17, |M=.49|) and kurtosis (-.05 to 1.76, |M=.45|). The reported values align with recommended thresholds (skewness>2; kurtosis> 7) (Curran et al., 1996; Ryu, 2011), substantiating the dataset's adherence to normality. Utilizing the AMOS software, we conducted structural equation modelling (SEM) for our analysis. SEM was chosen for its suitability in examining complex relationships among variables simultaneously, aligning with our research questions (Bagozzi and Yi, 1988; Kline, 2016). SEM allows us to comprehensively analyze latent constructs and their interrelationships, particularly suited for the multidimensional and interrelated nature of our study. It facilitates testing both measurement and structural models, enabling a nuanced understanding of the complex dynamics inherent in social value integration, circular economy practices, and their impact on sustainability performance within SMEs. SEM is instrumental in assessing direct and indirect effects, mediating relationships, and overall model fit. Its capability to explore mediating effects was crucial for our investigation into the roles of circular economy practices and operational effectiveness in the relationship between social value integration and sustainability performance. This methodological choice enhances the robustness and validity of our empirical analysis. SEM encompassed three stages. The first stage involved scrutinizing the validity of the model's factorial structure through the application of first-order confirmatory factor analysis (CFA). Subsequently, we assessed the reliability and validity of the constructs. Finally, we embarked on a path analysis to empirically evaluate our hypothesized relationships among the constructs.

5.1. Validity assessment for the measurement model

Table 2 presents the CFA results that show that the fit indices are satisfactory within commonly accepted parameters and exhibit a good fit [χ^2/df = 1.48, CFI=.93, AGFI=.80, IFI=.93, TLI=.92, RMSEA=.06]. The value of χ^2/df could be between 0 and 5, with lower values indicating a higher fit. The values of IFI, CFI, and TLI are all acceptable with close to 1.0 (Jansson et al., 2017). The AGFI index is between .80 -.90, which exceeds the acceptable level and exhibits a good level of fit. The RMSEA value of .05 also shows an outstanding fit.

5.2. Reliability and validity of the constructs

As presented in Table 1, all items are significantly associated with their respective core constructs ($p < 0.01$), with standardized loadings exceeding .50.

Convergent validity is demonstrated through the average variance extracted (AVE) values of the constructs (Table 1), with all constructs surpassing the threshold value of AVE (>.5), confirming their convergent validity (Fornell and Larcker, 1981; Malhotra, 2010). Additionally, Table 1 provides the composite reliability (CR) values, which assess the internal consistency of the constructs. Each construct exhibits a CR value exceeding .80, well above the threshold of .70, signifying satisfactory levels of construct reliability (Bagozzi and Yi, 1988).

Discriminant validity was evaluated by examining the covariance between pairs of constructs, as shown in Table 2. The significant differences observed between pairs highlight a high degree of discriminant validity, affirming that the constructs do not measure the same or similar concepts.

5.3. Hypotheses testing

We employed path analysis in AMOS to examine predictive weights and the relevance of the independent latent construct (i.e., SVI), along with its connections to a set of dependent latent constructs (CEI, OE, and EVC).

Descriptive statistics and correlations among the variables utilized in the study are presented in Table 3. Unlike traditional regression models, SEM is a versatile and comprehensive approach designed for the examination of latent variables and their interrelationships. The model was employed to test the path relationships, followed by assessing the mediation effects of CEI and OE. Furthermore, the combined serial mediation role of CEI and OE was examined.

Fig. 2 displays the parameter estimates for the conceptual framework, with fit statistics [χ^2/d.f. = 1.48, CFI=.93, TLI=.92, AGFI=.80, IFI=.93, RMSEA=.06] indicating a well-accepted fit to the data. Following the approach outlined by Hair et al. (2010), we initially employed the traditional Sobel test technique, as supported by Baron and Kenny (1986), to assess the mediation effects of CEI and OE between SVI and EVC.

Initially, an analysis was conducted by excluding the mediators from the model. This step requires that the direct link between the dependent and independent variables is significant. In the current model, when no mediator is considered, the relationship between SVI and EVC is indeed significant ($p < 0.01$), with a standardized weight of .57.

Subsequently, we introduced the mediators to the model to evaluate the conceptual framework. Our expectations were twofold: both the relationship between the independent variable and the mediator, as well as the relationship between the mediator and the dependent variable, should be statistically significant. Conversely, the relationship between the dependent and independent variables should become statistically insignificant. The confirmation of the mediation effect occurs when a previously significant relationship between the independent and dependent variables is rendered no longer significant.

The analysis further examined the mediation effects within the conceptual framework. Firstly, it was observed that the mediation effect

Table 1
Confirmatory factor analysis results[a].

Constructs	Items	Standardized Loadings[b]	AVE[c]	CR[d]
Social Value Initiatives	**SVI**		**.63**	**.91**
Contributing to community health and safety.	SVI1	.82		
Contributing to reducing environmental risks to public.	SVI2	.84		
Making progress in occupational health and safety processes.	SVI3	.78		
Improving awareness in protection of the human rights.	SVI4	.81		
Designing and undertaking social responsibility projects.	SVI5	.68		
Communicating effectively with the society.	SVI6	.76		
Circular Economy Initiatives	**CEI**		**.52**	**.90**
Adopting proactive approaches to reduce energy consumption in all relevant areas.	CEI1	.73		
Using recycled components and inputs as much as possible.	CEI2	.52		
Making products that are easily recycled.	CEI3	.56		
Utilizing clean technologies and equipment (emission filters and end-of-pipe controls) in all required areas and equipment.	CEI4	.61		
Increase in reputation because of the adoption of environmental management.	CEI5	.78		
Reducing waste within the production process with the environmental management.	CEI6	.85		
Performing better in environmental initiatives when compared to competitors.	CEI7	.82		
Reducing toxic waste with the environmental management.	CEI8	.77		
Reducing emission rates with the environmental management.	CEI9	.77		
Operational Effectiveness	**OE**		**.51**	**.88**
Increase in overall competitive position in the industry.	OE1	.69		
Improvement in overall performance of our supply-chain.	OE2	.76		
Decrease in employee turnover.	OE3	.69		
Improve in capacity on new product and service development.	OE4	.75		
Acceleration in new product/service development processes.	OE5	.77		
Improvement in capabilities on new product/service development based on investments in R&D.	OE6	.61		
New product/service development processes consider changes in customer preferences and needs.	OE7	.77		
Economic Value Creation	**EVC**		**.60**	**.89**
Our revenue has increased.	EVC1	.78		
Our sales have increased.	EVC2	.70		
Our market share has increased.	EVC3	.80		
Our operational profit has increased.	EVC4	.84		
Our cash flow from operations has increased.	EVC5	.82		
Our general costs have decreased.	EVC6	.67		

Notes.
[a] Chi square/df = 1.48, CFI = .93, AGFI = .80, IFI = .93, TLI = .92, RMR = .06, RMSEA = .06.
[b] Standardized Loadings: all loadings are significant at $p < .001$.
[c] AVE = Average variance extracted.
[d] CR = Composite reliability.

Table 2
Assessment of discriminant validity.

Test	Description	X^2 constrained	X^2 unconstrained	Difference[a]
1	SVI – CEI	61.7	86.6	24.9
2	SVI – OE	76.0	121.1	45.2
3	CEI – EVC	61.2	96.0	34.8
4	CEI – OE	51.3	105.0	53.7
5	CEI – EVC	50.2	85.9	35.7

[a] $p < .01$.

Table 3
Means, standard deviations, and intercorrelations.

Variable names	Definition	Mean	SD	1	2	3	4
1. SVI	Social value initiatives	3.88	.67	1			
2. CEI	Circular economy initiatives	3.72	.70	.75[a]	1		
3. OE	Operational effectiveness	3.78	.79	.71[a]	.62[a]	1	
4. EVC	Economic value creation	3.52	.63	.59[a]	.59[a]	.60[a]	1

Notes: SD: Standard deviation.
[a] $p < .01$.

of CEI on the relationship between SVI and EVC was indeed significant (Sobel test = 4.03, $p < 0.01$), thus providing support for H1a. Subsequently, the study identified the mediation effect of CEI between SVI and OE as being significant (Sobel test = 2.11, $p < 0.05$), lending further support to H1b. In the same vein, the research found the mediation effect of OE on the relationship between SVI and EVC to be statistically significant (Sobel test = 4.13, $p < 0.01$), thereby confirming H2a. Furthermore, the mediating role of OE in the relationship between CEI and EVC was also established as significant (Sobel test = 1.97, $p<.05$), aligning with H2b. These results prompted the examination of the serial mediation effect of CEI and OE combined on the link between SVI and EVC.

Table 4a shows mediation effects while Table 4b presents direct and total effects. Initially, we observed that SVI exhibited a significant positive effect on EVC (β=.57, $p<.01$), as shown in Table 4b, when no mediators were considered in the model. This finding suggests that SVI has a substantial direct impact on EVC, which is the first condition of mediation effect based on Baron and Kenny (1986).

For examining the role of CEI and OE as individual mediators, we proceeded to assess the mediating roles of CEI and OE individually in the relationship between SVI and EVC. Table 4a indicates that both CEI (β=.32, $p<.01$) and OE (β=.23, $p<.01$) demonstrated significant indirect effects on EVC, suggesting that both CEI and OE play pivotal roles in transmitting the influence of SVI to EVC.

To test the existence of the serial mediating role of CEI and OE, we conducted further analysis and revealed that the relationship between SVI and EVC was serially mediated by the combined effects of CEI and OE. The direct effect of SVI on EVC was found to be statistically insignificant (β[direct] = -.13, $p > 0.1$) in the presence of the mediators, while the specific indirect effects of SVI on EVC via CEI and OE were positive and significant. This suggests that CEI and OE together explain the entirety of the impact of SVI on EVC.

To quantify the serial mediation effect of CEI and OE, we calculated the standardized regression weights of their combined effect. The serial mediating effect was calculated by multiplying the standardized

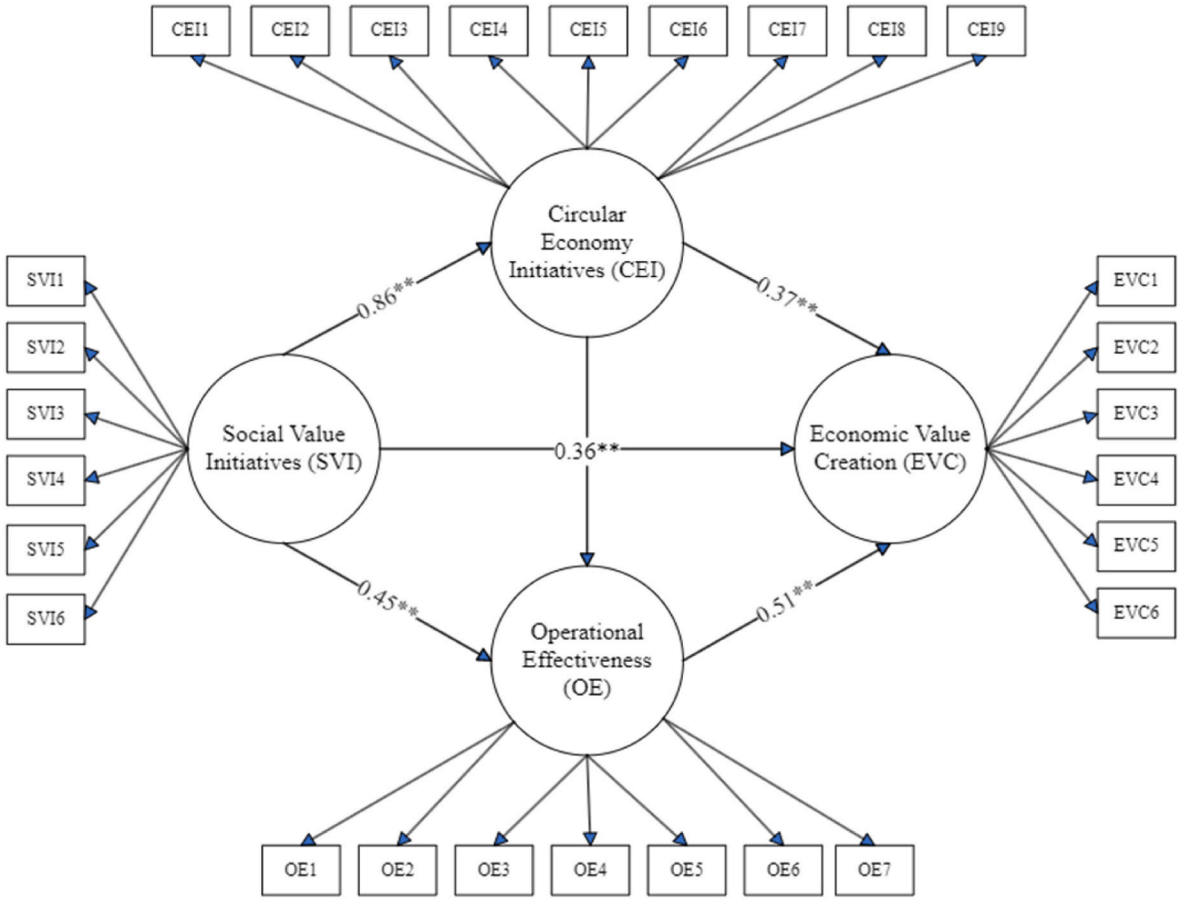

Fig. 2. Estimated results of the serial mediation model.

Table 4a
Results of serial multiple mediation for SVI – mediation effects.

Paths	Relations	Unstandardized weights	Indirect effect	z score
H1a: SVI → CEI → EVC	SVI → CEI CEI → EVC	.896 (.061) .417 (.119)	.373 (.109)	3.422ξ, **
H1b: SVI → CEI → OE	SVI → CEI CEI → OE	.896 (.061) .348 (.083)	.312 (.08)	4.031ξ**
H2a: SVI → OE → EVC	SVI → OE OE → EVC	.455 (.061) .684 (.10)	.311 (.08)	4.124ξ**
H2b: CEI → OE → EVC	CEI → OE OE → EVC	.348 (.083) .684 (.10)	.238 (.066)	3.584ξ [d]
H3: SVI → CEI → OE → EVC	SVI → CEI CEI → OE OE → EVC	.896 (.061) .348 (.083) .684 (.10)	.213 (.06)	3.482ξξ [d]

Notes.
Standard errors are indicated within the parentheses.
2-tail $z-score = \gamma 1 * \beta 1 / \sqrt{\beta 1^2 * Se\gamma 1^2 + \gamma 1^2 * Se\beta 1^2}$ for single mediation effect.
2-tail $z-score = \frac{\gamma 1 * \beta 1 * \beta 2}{\sqrt{\gamma 1^2 * \beta 1^2 * Se\beta 2^2 + \gamma 1^2 * \beta 2^2 * Se\beta 1^2 + \beta 1^2 * \beta 2^2 * Se\gamma 1^2}}$ for serial multiple mediation effect.
[d] $p < .01$.

regression weights of the effects of CEI and OE together, as shown in Table 4b (Taylor et al., 2008). The estimates of the serial multiple indirect mediation effect were found to be significant ($p<.01$). The Sobel test further confirmed the statistical significance of the serial mediation effect (Sobel test value = 3.48, $p<.01$).

Furthermore, we employed a bias-corrected bootstrap confidence interval method to confirm the existence of the serial mediation effect (Preacher and Hayes, 2008). This method was chosen over the traditional Sobel test due to its superior control over type I error (MacKinnon et al., 2004; Preacher and Hayes, 2008; Zhao et al., 2010). Employing this technique, we generated 5000 resamples and obtained robust evidence of the significant serial mediation effect of CEI and OE on the relationship between SVI and EVC (bootstrapping estimate = 0.702, $p<.01$; 95% CI: 0.308, 1.257).

6. Discussion and implications

Rooted in STV, this study unravels the intricacies of the TBL framework by delving into its foundational elements. In achieving our study objectives, we have highlighted the pivotal role of SVI in enhancing SME performance, particularly within the emerging market context of Turkey. Our findings offer empirical evidence supporting our primary objective, illustrating how SVI influences performance through the mediating roles of CEI and OE. This alignment with our secondary objective contributes new insights into the CE's role within the sustainability paradigm, addressing a notable gap in current academic discourse. The STV adopted in our study enriches this understanding, illustrating the interconnected nature of these sustainability dimensions.

Our findings suggest that, particularly for SMEs in emerging markets, integrating SVI into business models is not only beneficial for society and the environment but also contributes to economic performance. This supports a more sustainable business approach, aligning with global sustainability goals. Rodríguez-Espíndola et al.'s (2022) research distinctively illustrates how the adoption of CEI within SMEs can act as a catalyst for transformative changes across various organizational dimensions. Their findings indicate that CE adoption is not merely a strategic shift but also instigates substantial innovation at the product, process, and organizational levels. This reinforces the idea that CE is integral to evolving business models within SMEs, driving them towards more sustainable and innovative practices. Moreover, the study highlights the significance of circular thinking in leveraging digital platforms, instrumental in successfully integrating sustainable-oriented innovation into business operations.

Our in-depth analysis involved a meticulous examination of the structural relationships among SVI, CEI, OE, and EVC. This encompassed the validation of the measurement model, ensuring the reliability and discriminant validity of constructs, and a thorough path analysis to rigorously test our hypothesized relationships. Adopting this comprehensive approach enables a nuanced understanding of how different sustainability dimensions interact within SMEs, guided by the STV.

Our findings suggest that changes in business practices can lead to the enhancement of sustainability initiatives across the broader system, particularly when facilitated by accessible tools early in the innovation process, fostering a systemic perspective (Schlüter et al., 2023). In the context of implementing the TBL, companies often emphasize environmental aspects, such as familiarity with ISO14000, setting and announcing targets in carbon emissions, and waste reduction, striving for operational and financial performance resulting from these activities. The growing prominence of environmental performance in the CE aligns with the World Economic Forum (2020) recent report, emphasizing that environmental concerns will dominate the top long-term risks over the next 10 years.

Conversely, the relatively low ranking of financial performance in the TBL may be attributed to challenges in associating firm performance measures with social and environmental sustainability measures. This challenge arises due to the highly specific nature of the firm's performance indicators, particularly the unique role of operational performance in making the greatest contribution to the firm's financial performance (Croom et al., 2018).

Furthermore, our study seeks to underscore the paramount

Table 4b
Results of serial multiple mediation for SVI - total effects and direct effects.

Paths	Total effect[g]	Direct effect	Relations	Standardized weights	Indirect effect[h]	Mediation
H1a: SVI → CEI → EVC	.57[f]	-.13	SVI → CEI CEI → EVC	.86[f] .37[f]	.32[f]	Supported (full mediation)
H1b: SVI → CEI → OE	.72[f]	.45*	SVI → CEI CEI → OE	.86[f] .36[f]	.31[f]	Supported (partial mediation)
H2a: SVI → OE → EVC	.57[f]	-.13	SVI → OE OE → EVC	.45[f] .51[f]	.23[f]	Supported (full mediation)
H2b: CEI → OE → EVC	.64[f]	.37*	CEI → OE OE → EVC	.36[f] .51[f]	.18[f]	Supported (partial mediation)
H3: SVI → CEI → OE → EVC	.57[f]	-.13	SVI → CEI CEI → OE OE → EVC	.86[f] .36[f] .51[f]	.16[f]	Supported (serial mediation)

Notes.
$p < .05$.
[f] $p < .01$.
[g] Total effect represents the effect without any mediators.
[h] The significance levels are identified by conducting Sobel test.

importance of social value initiatives undertaken by organizations, accentuating their increasing relevance in the realm of sustainability. Drawing on the insights shared by Bubicz et al. (2021), it becomes evident that a comprehensive and collaborative approach is imperative. These insights underscore that social sustainability extends beyond corporate boundaries, necessitating active stakeholder involvement at various tiers and fostering social innovation for the betterment of workers, communities, and overall well-being.

In 2022, professionals in the energy industry emphasized that the most significant challenge in the energy transition is human capital rather than financial capital, leading to intense competition for attracting talent among oil majors, utilities, renewable energy groups, and private equity houses—all vying for the limited pool of green skills (Wilson, 2021). Expanding on the findings presented by McDougall et al. (2022), which highlight the pivotal role of fostering environmental awareness and collaboration for SMEs, it becomes apparent that social value creation is an intrinsic aspect of sustainable business practices. The study underscores the potential of SMEs to contribute to social value through initiatives promoting environmental awareness and education among employees and the broader community.

Moreover, the establishment of collaborative partnerships with stakeholders, including NGOs and regulatory bodies, not only enhances environmental sustainability but also generates social value by fostering knowledge sharing and raising awareness about pressing environmental issues. Policymakers, in alignment with these insights, can contribute to social value by incentivizing proactive environmental practices within SMEs through policies such as tax credits and subsidies. These combined efforts illuminate the multifaceted nature of sustainability, where environmental and social dimensions are intricately linked, paving the way for a more socially responsible and environmentally conscious SME sector. Evidently, a holistic approach is imperative in organizations to address environmental and social demands while sustaining financial gains.

The findings presented in this study hold relevance in the context of SMEs. Given the resource constraints that characterize SMEs, owner-managers play a crucial role in ensuring that invested resources yield optimal results. Drawing on insights from research conducted by Mady et al. (2023), our study sheds light on the pivotal role of environmental capabilities in securing the sustainable competitive advantage of SMEs. Mady et al.'s (2023) research underlines the significance of fostering an eco-innovation-oriented culture within SMEs, emphasizing the adoption of eco-innovation practices to concurrently enhance both environmental sustainability and competitive advantage.

Moreover, the study emphasizes the value of green absorptive capacity and environmental orientation in facilitating eco-innovation and, consequently, sustaining competitive advantage for SMEs. This knowledge not only offers practical guidance for SMEs navigating resource limitations but also underscores the broader policy implications. Incentivizing environmental orientation and fostering collaborative environmental partnerships emerge as critical strategies to empower SMEs on their journey towards achieving sustainable competitiveness. These insights contribute to both theoretical understanding and actionable strategies for SMEs seeking to balance environmental sustainability with competitive advantage.

The findings highlight the profound impact of investing in community and societal well-being on the environmental initiatives embraced by firms, leading to enhanced operational effectiveness and, ultimately, improved financial performance. This insight challenges the conventional perception of SMEs, often viewed as primarily focusing on customers as a key stakeholder group. Instead, the study reveals that SMEs can effectively engage with multiple internal and external stakeholders, including the community, the environment, supply chain partners, and their own employees, as well as contributing to society at large. In doing so, owner-managers can simultaneously benefit various stakeholders, thereby enhancing the overall survival prospects of the SME.

In accordance with the principles outlined by Porter and Kramer (2011), our study recognizes that by contributing to the well-being of diverse stakeholders, SME owner-managers set in motion a chain reaction that promotes societal betterment. Our emphasis on the pivotal role of stakeholder integration in facilitating CEI aligns with the insights of Guo et al. (2022). They contend that an expanded focus on stakeholder interests is crucial for Sustainable Business Model Innovation (SBMI). According to Guo et al. (2022), integrating stakeholders not only stimulates the development of new sustainable business models but also provides the necessary resource base for implementing SBMI. This highlights the importance of a stakeholder management strategy tailored to the unique characteristics of SBMI.

6.1. Theoretical implications

The adoption of a STV is paramount in comprehending relationships, interactions, and overlapping interests among units, moving beyond a focus on isolated elements (Reich, 1991). An STV mindset proves instrumental in consolidating information, mitigating unintended outcomes, and optimizing the effects that influence the TBL (Sorrell, 2009; Sterman, 2001). A recent study by Nudurupati et al. (2022) further accentuates the significance of a holistic approach when integrating CE practices into SME operations. The study emphasizes the crucial role of government support, advocating for initiatives such as the creation of industrial parks and knowledge-sharing platforms at the meso level, along with proactive policy measures at the macro level. Additionally, it underscores the importance of value creation through innovative means and highlights the pivotal role of consumers in propelling sustainability efforts. These insights stand as invaluable guidance for both SMEs and policymakers, offering strategic pathways to enhance sustainability and resource efficiency within the Indian SME sector.

The adoption of the STV creates system-wide changes, such as actions taken on energy savings and climate change to help reduce poverty (Ferraro et al., 2015). In alignment with Ghio and McGuigan (2020), this study argues that there should be an integration of pluralism with respect to the responsibilities of corporations toward different stakeholders. Therefore, an integrative approach, such as establishing funds and acquiring assets involved in reducing climate change and building a net zero future, play an essential role in building capabilities. This also may improve strategic directions by quickly unpacking the knowledge and expertise required in managerial decisions regarding the TBL. This study, therefore, was an attempt to fill this gap, as analyzing the TBL within a STV stance that could offer a more precise understanding of how firms might establish linkages among the environmental, social, and financial performance aspects of the TBL.

This study also contributes to STV in management and organizations domain by bridging internal (operational and financial outcomes) and external (social and environmental effects) factors that affect firms in terms of sustainability. Firms have been undergoing some problems in developing a responsive approach to the TBL and have experienced issues in recognizing its holistic nature, which is made up of subsystems (Landrum and Ohsowski, 2018; Rebelo et al., 2015). As such, firms that have a short-term orientation (i.e., financial gain) tend to underinvest in activities that will create future benefits (i.e., CSR) (Slawinski and Bansal, 2015). Conversely, legitimacy orientation has become an essential indicator of sustainability management not only for established companies but also for SMEs because of increasing transparency and ethical calls (Schaltegger and Horisch, 2017). Thus, the STV is not only about managing the subsystems of parts of larger systems but also about constituting a set of goals and purposes to make reliable inferences about the processes and to understand the existing mindsets.

6.2. Managerial implications

This study has relevant implications for practice. Owner-managers play a vital role in managing a system by focusing on different aspects of the TBL. The initiatives taken through the TBL by the corporations are

disrupted when corporate leaders implicitly deny their responsibilities for social scopes and natural resources (York et al., 2018). Owner-managers who collaborate for their firms may adopt a pragmatic stance by both making financial gains a priority and keeping up with their established routines (Doh and Quigley, 2014). On the other hand, regulations set by the authorities, customer pressures, and other institutional sources pressure firms to integrate the TBL as a system covering all its pillars. For example, many jurisdictions are now enforcing mandatory climate disclosures, requiring organizations to share specific climate-related information, such as greenhouse gas emissions (Ding et al., 2023). As such, the integrated perspective of the TBL, which consists of realizing the performances of practices stemming from environmental management and social perspectives, as well as their reflections on a firm's overall economic value creation, could help create the TBL holistically. Therefore, a managerial role responsible for sustainability could be deemed a commitment to the future sustainability performance of corporations. A long-term focus of sustainability can be assured by following responsible leadership which helps firms to form strong ties with their stakeholders (Maak and Pless, 2006).

Further, the emphasis in this study is on generating value by integrating welfare and commercial reasons. While owner-managers in SMEs are not accustomed creating social value or engaging in social business models in general, our research offers them a perspective of the CEI characteristics that help them to build further capabilities and skills. Further, by focusing on the value coming from social perspective, we aim to inspire owner-managers in SMEs to reconsider their established ways of doing business. We provided evidence on when social value creation is combined with environmental initiatives and operational stance paves the way through organizational outcomes in terms of economic performance. The insights derived from Howard et al. (2022) underscore the multifaceted role of SMEs within CE systems, shedding light on how their collaboration and value-sharing endeavors with local stakeholders significantly contribute to business, societal, and ecosystem values. The study accentuates the critical importance of SME resilience, emphasizing its foundation in a nuanced understanding of local societal identities and ecosystems, while also linking their practices to geographically specific natural capital. Furthermore, the research advises managers to strike a balance between short-term efficiency and long-term sustainability goals. It staunchly advocates for adopting a place-based approach to CE practices—one that is tailored to the unique needs and resources of SMEs, reinforcing the notion that customization based on local contexts is integral to fostering sustainable business practices.

6.3. Limitations and future research

While this study offers valuable insights, it is essential to acknowledge its limitations and identify potential avenues for future research. These limitations provide opportunities for further exploration and expansion of the study's findings.

The current research primarily focuses on a single emerging country, which could limit the generalizability of the findings to other contexts. To enhance the robustness of the study's conclusions, future research should replicate the investigation of the TBL through the STV lens in diverse countries and industries. Comparative studies involving multiple emerging countries would enable the identification of cross-cultural variations and industry-specific dynamics that influence the TBL implementation. Additionally, the sample size of this study, while sufficient for its scope, might not encompass the full spectrum of emerging country firms. Future research could involve larger sample sizes to improve the representativeness and statistical power of the findings. Moreover, extending the study to encompass a broader range of emerging economies would provide a more comprehensive understanding of the nuances associated with different stages of economic development. Furthermore, investigating the causal relationships between TBL dimensions and their impacts could yield valuable insights. Future research might explore how the integration of management systems, such as environmental and quality management, ISO 26000, and CSR management systems, influences the TBL outcomes. This approach could shed light on the interplay of various sustainability-oriented practices and their collective effect on operational, financial, and social performance.

In addition, it is worth considering the inclusion of potential contingency variables and other influential factors in future research. For instance, the role of firm ownership structure (i.e., wholly local, wholly foreign, and joint venture), along with the degree of internationalization, can significantly influence the analysis and results of the study. Moreover, exploring additional influential factors, such as market orientation, customer orientation, and corporate governance mechanisms, could provide further insights into how these variables interact with the TBL in various organizational contexts. To gain a more comprehensive understanding, future research might delve into the influence of macro-level contextual factors, such as legal requirements, economic development levels, and cultural dimensions. This exploration would contribute to a broader comprehension of the TBL's applicability across diverse environments.

Lastly, the reliance on self-reported measurements from executives introduces potential biases and subjectivity into the data. Future research could incorporate objective measurements and external indicators to triangulate findings and enhance the validity of the results. Employing a mixed-methods approach that combines quantitative data with qualitative insights could provide a more comprehensive understanding of the TBL dynamics and their implications.

In addition to the acknowledged limitations, this study's alignment with the United Nations' 17 Sustainable Development Goals (SDGs) lays the groundwork for promising avenues in future research. While the study illuminates the intricate interplay among social value, circular economy practices, and organizational performance, particularly within SMEs in emerging markets like Turkey, there exists a significant opportunity to deepen our understanding of how these elements contribute to the achievement of the SDGs. Future research endeavors could incorporate specific metrics related to the SDGs into the analysis of social value creation and circular economy practices. This strategic integration would yield a more comprehensive understanding of how SMEs actively contribute to global sustainability efforts and pinpoint areas where potential gaps may exist. Appendix 2 systematically categorizes each SDG based on its relevance to social value creation and CE initiatives, accompanied by a succinct explanation of the corresponding relationships.

Conducting comparative studies could unveil the specific SDGs that experience the most positive influence from these practices, shedding light on areas where additional attention is required. Future research endeavors should also emphasize exploring the policy implications of these findings, investigating how governments and international organizations can actively support SMEs in aligning with the SDGs. This exploration might encompass recommendations for a range of measures, including incentives, regulations, and support mechanisms.

7. Conclusion

In conclusion, our study illuminates the transformative potential inherent in the integration of SVI within SMEs, particularly in the context of emerging markets. The central and compelling finding of our research underscores the remarkable mediating effect of CEI and OE along the trajectory from SVI to EVC. This revelation not only accentuates the intricate interplay between these elements but also highlights their synergistic role in propelling sustainable business practices.

Our study challenges traditional perspectives by offering a nuanced understanding of sustainability efforts, surpassing mere environmental considerations. The profound integration of social values within the operational and strategic landscape of SMEs emerges as a key outcome. Beyond the linear approach that often compartmentalizes economic,

social, and environmental sustainability, our findings suggest an intertwined and mutually reinforcing relationship among these objectives. This insight provides a departure from conventional notions, signaling that SMEs can concurrently pursue economic prosperity, social responsibility, and environmental stewardship.

Importantly, this research does not merely contribute to existing literature but acts as a catalyst for a paradigm shift in SMEs' perceptions of their role in sustainable development. It emphasizes that economic growth, social impact, and environmental sustainability are not mutually exclusive pursuits but rather integral components of a holistic and interconnected approach to business success. By unraveling the intricate dynamics of SVI, CEI, and OE within SMEs, our study serves as a guide for rethinking and reshaping sustainable practices in the ever-evolving landscape of emerging markets.

As SMEs navigate the complexities of global markets, they are presented with an opportunity to redefine their narrative. Our findings underscore the importance of cultivating a TBL mindset that harmonizes economic viability with social responsibility and environmental stewardship. This reorientation can position SMEs as key drivers of sustainable development, aligning their operations with global goals while responding to the unique challenges and opportunities present in emerging markets.

In summary, our research not only advances academic understanding but also provides practical insights for SMEs, policymakers, and stakeholders. It encourages a holistic approach to sustainability, urging SMEs to embrace their role as contributors to economic, social, and environmental well-being. By adopting and internalizing the principles of social value, circular economy, and operational effectiveness, SMEs can chart a course toward a more sustainable and resilient future.

CRediT authorship contribution statement

Ozlem Ayaz: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Ekrem Tatoglu:** Writing – review & editing, Supervision, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix 1. Synopsis of recent research on triple bottom line and CE initiatives in SMEs (2021–2023)

Author(s)	Dimension(s)	Methodology	Outcomes
Centobelli et al. (2021)	• Social pressure • Green economic incentives • Environmental commitment • CE capability	212 SMEs; CFA and SEM model	• Directly and exclusively impacting green economic incentives through social pressure. • Affecting environmental commitment and supply chain relationship management (SCRM) almost equally, with heightened impact on SCRM and sustainable supply chain design. • Extending understanding of social pressure's positive influence on green incentives and environmental commitment. • Reinforcing the role of regulatory and financial bodies in using social pressure to boost environmental commitment and economic incentives. • Highlighting SCRM and SSCD's crucial roles in building CE capability, with a strategic emphasis on SCRM.
Bag et al. (2022)	*SMEs' contribution to the CE through:* • Institutional pressures • Eco-innovation • Green supply chain management (GSCM) practices • CE capability • Big data driven supply chains (BDSC) • Performance for CE supply chains	A survey based on 240 people working in SMEs in the manufacturing sector in South Africa; SEM, exploratory factor analysis and, structural path analysis.	• Found positive relationships between coercive, normative, and mimetic pressures and eco-innovation, highlighting their importance in the CE context. • CE knowledge crucially strengthens the link between organizational factors and CE adoption. • Eco-innovation positively impacts both GSCM practices and CE adoption. • GSCM practices, including green purchasing and eco-design, positively correlate with CE adoption. • BDSCs have a moderating effect on the relationship between CE adoption and firm performance. • Management needs to recognize institutional pressures that shape eco-innovation for better GSCM practices and CE adoption. • Suggests focusing on eco-innovation determinants and strengthening —GSCM policies to facilitate CE adoption, with attention to big data privacy/security. • Addresses waste management challenges in South Africa, emphasizing the government's role in advancing CE for better circularity and resource management.

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Author(s)	Dimension(s)	Methodology	Outcomes
Chowdhury et al. (2022)	*CE practices:* • Ecological product/service design. • Reuse of products post-initial use. • Use of recycled materials in processes. • Timely disposal of machinery/equipment. *Sustainable performance:* • Reduced manufacturing costs. • Higher returns on green products. • Lower inventory carrying costs. • Decreased transportation/handling costs. • Waste reduction in processes. • Enhanced environmental compliance. • Lower carbon emissions. • Increased revenue from green initiatives. • Improved work safety. • Enhanced work environment. • Strong environmental commitment by employees/managers. • Job creation for community and entrepreneurial growth.	SMEs' employees in Vietnam; SEM model	• Leadership in SMEs positively influences innovation, culture, skills, and competencies. • Organizational leadership strongly drives innovative practices, impacting CE practices. • Leadership shapes organizational culture, crucial for adopting CE practices. • CE adoption and management are led by senior management, overshadowing employees' skills and competencies. • Combination of lean management and sustainable innovation improves sustainable performance. • CE practices significantly enhance sustainable performance in SMEs. • CE contributes to economic growth and social well-being, including job creation.
Howard et al. (2022)	*CE systems resilience* • Business value • Ecosystem value • Societal value	Case study	• Identifies how SMEs cooperate and share value with local stakeholders. • Highlights SMEs' contribution to business, society, and ecosystem values. • Links SME resilience to understanding of local societal identities and ecosystems. • Connects SME practices to geographic-specific natural capital. • Presents a model showing tensions and trade-offs in CE system adoption. • Advises managers to balance short-term efficiency with long-term sustainable goals. • Suggests place-based CE approach for sustainable SME practices.
McDougall et al. (2022)	*Internal circular operations* • Recapturing and reuse of water; resource recapturing • Specialized machinery to collect spillage; waste segregation for reuse and/or recycling *Supply chain circular operations* • Reuse of packaging and distribution materials between supply chain partners • Crop grading for reuse, resale, redistribution or recycling with supply chain partners • Crop grading for reuse, resale, redistribution or recycling with supply chain partners *Societal circular operations* • Use of recaptured waste waters to facilitate biodiversity pond, with measurable ecologies. • On-site water, wind and solar recapture for on-site energy generation and resale to the grid. • Use of recaptured waste waters to facilitate biodiversity pond, with measurable ecologies.		• Shifts perspective from triple-bottom-line to NRBV, viewing circular operations as a competitive opportunity rather than an environmental obligation. • Addresses the need for complete redevelopment of operations and system-wide innovation in circular operations. • Highlights competitive benefits as stronger incentives than environmental obligations. • Emphasizes the importance of competitive cost benefits, mitigating concerns of cost and risk in circular operations. • Relevant for SMEs focusing on tangible value of sustainable operations. • Useful for engaging supply chain partners and stimulating policy-level engagement. • Supports industry and political efforts to increase uptake of circular operations.
Nudurupati et al. (2022)	*CE* • Design • Procure • Manufacture • Distribute • Use • Recover *Sustainability performance* • Economic performance • Environmental performance • Social performance	12 case-studies from Indian manufacturing and process-based SMEs	• Identifying organizational strategy, management initiatives, employee adaptability, and government support as key to adopting CE principles. • Complementing RBV theory by emphasizing internal capabilities in implementing CE models for sustainable performance. • Highlighting CE's role in fostering recycling, reuse, or remanufacturing of end-of-life products in supply chains. • Stressing the importance of broad stakeholder collaboration for implementing 5R principles in CE. • Emphasizing digital infrastructure and capabilities for data-driven CE decision-making.

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Author(s)	Dimension(s)	Methodology	Outcomes
Rodríguez-Espíndola et al. (2022)	*Sustainable-oriented innovation* • Social performance • Environmental performance • Economic performance *CE principles*	165 Mexican SMEs; SEM model	• Exploring CE practices in Indian SMEs, underscoring a holistic approach and consumer involvement in product recovery. • Emphasizing the global priority and challenges in SME sustainable practices. • Unveiling insights into CE and SOI interplay in SME sustainable performance. • Fostering innovation in SMEs at various levels through CE adoption. • Leveraging digital platforms for SOI through circular thinking. • Shaping company activities by customer pressure and competitive environments. • Guiding the adoption of digital platforms through government support.
Calzolari et al. (2023)	*Institutional pressures* • Coercive (regulatory and market) • Normative • Mimetic *CE practices* • Reduce • Reuse • Recycle *Supply chain integration* • Develop collaborative approaches • Share information • Couple systems • Joint decision making *Direct integration* • Suppliers • Customers	Using a Delphi-like approach and leveraging on a panel of 30 experts in the field of CE, this study aims to gain additional insights into how coercive, normative, and mimetic pressures can drive the implementation of circular supply chains.	• Found positive relationships between coercive, normative, and mimetic pressures with eco-innovation, adding to existing literature. • CE knowledge identified as key in strengthening the link between organizational factors and CE adoption. • Described a regulation-driven path in CE, involving passive compliance to environmental regulations and incremental CE practices, with SCI amplifying this process. • Outlined a market-driven path in CE, marked by proactive CE practices adoption driven by consumer demand, leading to radical CE practices and new partnerships. • Coercive IPs highlighted as pivotal in initiating sustainability actions and stimulating other pressures. • Acknowledged the necessity for wider societal transformation beyond just regulatory changes to achieve effective sustainability. • Showed how SCI influences CE practice adoption, noting the balance between its benefits and the risk of impeding radical innovation.
Erdiaw-Kwasie et al. (2023)	*Independent variables* • Institutional factors • Contextual factors • Strategic factors *CE adoption:* • Service sharing • Service longevity • Service ownership	Ghana's service sector as a case study; 493 top-management employees drawn from 267 service organizations using simple random sampling	• Assessing CE knowledge's role in bolstering the link between organizational factors and CE adoption. • Demonstrating a direct link between CE adoption and sustainable service, moderated by CE knowledge. • Supporting the role of organizational factors in facilitating CE practice adoption for improved circular and environmental performance. • Suggesting positive impact of CE adoption on sustainable service via service longevity, sharing, and ownership. • Emphasizing the need for early circular initiatives in supply chains and managerial investment in CE for sustainable service. • Discussing social consequences of rapid CE practice adoption and the need for investment in sustainable service innovations. • Confirming an indirect relationship between organizational factors and –CE adoption, and a direct one between CE adoption and sustainable service, emphasizing the enhancing role of CE economy knowledge.
Le et al. (2023)	CE practices (CEP), eco-innovation (ECI), cleaner production (CLP), and the resilience of production systems (RePS). *CEP:* Embed culture, appraisal system; eco-friendly product and process design; supplier selection based on economic/environmental criteria; workforce training; awareness in value chain; cross-functional collaboration; practice of reduce, reuse, remanufacture, recycle. *ECI:* Process, product, technology, equipment, and system innovation for material circularity, energy saving, and pollution prevention. *CLP:* Improved production efficiency and safety; lean practices; reduced raw materials, fuel,	A questionnaire-based survey for data collection with 499 valid responses; PLS based SEM for empirical analysis.	• CEP adoption enhances RePS by extending material lifecycles for maximized value. • Adopting CEP encourages ECI and CLP by aligning resources, culture, and management towards CE-based practices. • ECI and CLP partially mediate the relationship between CEP and RePS, indicating that CEP triggers organizational adaptability and promotes material circularity, driving ECI and CLP. • Provides a framework for SMEs in the food sector to maintain production resilience amid disruption and uncertainty.

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Author(s)	Dimension(s)	Methodology	Outcomes
	energy, water use; non-toxic ingredients; eco-friendly materials; renewable energy usage. *RePS:* Decreasing cost of adaptability; enhanced normal functioning, disruption absorption, damage minimization, recovery, and adaptation to uncertainty over time.		• CLP is associated with sustainable development by saving materials and energy and addressing broader sustainability concerns. • The study bridges the gap between academic research and the practical need for resilient production systems, supporting the notion that resilience is key to overcoming challenges and accommodating disruptions economically. • ECI and CLP positively associate with sustainable competitive advantage, driven by CEP. • CEP adoption across business operations and innovation in various dimensions, emphasizing the need for targeted policies and support for SMEs in emerging economies. • Conclusion: Comprehensive adoption of CEP enhances eco-innovation and cleaner production, leading to resilient production systems in SMEs, particularly in emerging economies. This contributes to expanding the literature on CE by demonstrating the mechanism through which CEP drives eco-innovation and cleaner production towards production system resilience.

Appendix 2. Alignment of sustainable development goals with social value creation and CE initiatives

Sustainable development goals	Related to social value creation	Related to CE initiatives
No poverty	Alleviating poverty contributes to social value.	
Quality education	Providing educational opportunities enhances social value.	
Gender equality	Promoting gender equality adds significant social value.	
Clean water and sanitation	Access to basic water and sanitation needs for social welfare.	
Decent work and economic growth	Promoting fair employment opportunities.	
Reduced inequalities	Efforts to reduce inequality are central to social value.	
Sustainable cities and communities	Creating inclusive and sustainable urban environments.	
Peace, justice, and strong institutions	Strengthening societal structures and ensuring justice.	
Partnerships for the goals	Collaborative efforts enhance social value creation.	
Responsible consumption and production		Central to the concept of CE.
Climate action		Mitigating climate change impacts through sustainable practices.
Life below water		Protecting marine resources aligns with circular principles.
Life on land		Promoting sustainable land use and forest management.
Affordable and clean energy		Efficient and sustainable energy use.
Industry, innovation, and infrastructure		Encourages sustainable industrial practices and innovations.

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