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Research article

Corporate governance and circular supply chains: Synergizing eco-adaptive organizational culture, leadership eco-innovation willingness, and perceived urgency for circularity

Osman Babamu Halidu [a], Meshach Awuah-Gyawu [b], Alexander Otchere Fianko [b], Bright Akwasi Gyamfi [c], Simplice A. Asongu [d,e,f,*]

[a] Faculty of Business, Department of Accounting Information Systems, Kumasi Technical University, Kumasi, Ghana
[b] Faculty of Business, Department of Procurement and Supply Chain Management, Kumasi Technical University, Kumasi, Ghana
[c] Center of Accounting, Finance and Economics, Multimedia University, 63100, Cyberjaya, Selangor, Malaysia
[d] School of Economics, University of Johannesburg, Johannesburg, South Africa
[e] Tashkent State University of Economics, Islom Karimov 49, 100066, Tashkent, Uzbekistan
[f] The Institute of Convergence Science, Korea University, Seoul, South Korea

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ABSTRACT

In response to escalating environmental constraints and resource pressure, transitioning to a sustainable circular economy is imperative for contemporary enterprises. Circular Supply Chain Management (CSCM) offers a systemic approach to minimise waste and advance regenerative practices. However, the role of Corporate Governance (CGOV) in this transformation remains underexplored, especially in emerging economies. To address this gap, this study develops and empirically tests a framework to examine how CGOV fosters CSCM using data from 381 manufacturing firms in Ghana. Structural equation modelling revealed that CGOV partially influences CSCM through the mediating role of Eco-Adaptive Organizational Culture (EAOC). While Leadership Eco-Innovation Willingness (LECOIN) significantly moderates the CGOV-EAOC relationship, its influence does not extend to impact CSCM outcomes. Importantly, this study identifies the Perceived Urgency for Circularity (PURGENCY) as a critical boundary condition that intensifies the indirect effect of CGOV on CSCM via EAOC when PURGENCY is high. These findings offer a novel theoretical contribution by elucidating the interdependent dynamics of governance, leadership disposition, cultural adaptability, and perceived urgency in enabling circular transition. Practically, this study provides actionable insights for corporate leaders, supply chain strategists, and policymakers seeking to realign governance mechanisms and leadership capabilities to accelerate circular economy implementation by communicating a sense of urgency that can accelerate systemic transitions toward circular economy adoption.

1. Introduction

In today's fast-paced industrial environment, manufacturing firms are under increasing pressure to incorporate sustainability into their long-term strategic goals. Corporate governance (CGOV) has emerged as a crucial enabler, crafting the strategic frameworks necessary to drive sustainable innovation (Iftikhar et al., 2024; Malik, 2024). However, studies focusing on how CGOV drives circularity strategies are still scarce, despite the growing emphasis on the role of CGOV in sustainable business policies (Tang et al., 2025; Palea et al., 2024; Esposito et al., 2023). CGOV is described as a framework that encompasses the processes and structures designed to control and direct organisations. It comprises a set of regulations that govern the interrelationships between management, shareholders, and stakeholders (Abdullah and Valentine, 2009). Effective CGOV ensures that sustainability commitments are not just rhetorical, but are deeply embedded in corporate missions, visions, and values, shaping the company's long-term direction (Marfo et al., 2024). It acts as a catalyst for embedding circularity into strategic supply chain decision making, resource allocation, and innovation management through transparency, accountability, and ethical decision-making

* Corresponding author. School of Economics, University of Johannesburg, Johannesburg, South Africa.
E-mail addresses: osman.halidu@kstu.edu.gh (O.B. Halidu), meshlin2015@gmail.com (M. Awuah-Gyawu), thegreatofa@gmail.com (A. Otchere Fianko), brightgyamfi@mmu.edu.my (B.A. Gyamfi), asongusimplice@yahoo.com, asongus@afridev.org (S.A. Asongu).

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within the supply chain of an organization.

Previous studies have primarily used stakeholder-agency theory to explain how CGOV drives sustainability performance by viewing sustainability as a response to compliance, reputation management, or risk mitigation (Minciullo et al., 2022; Correa-Mejía et al., 2024). Stakeholder-Agency Theories suggest that managers act opportunistically, requiring external controls to align with stakeholder interests, overlooking intrinsic motivation, and values-driven leadership in circular strategies. Also, Sendawula et al. (2021), utilizing Legitimacy Theory, emphasise the significance of regulatory controls, legitimacy-seeking behaviors, and deterrence mechanisms in fostering environmental sustainability. However, these externally driven strategies do not adequately address the proactive, intrinsic motivations that enable CGOV to catalyze circular supply chain transformation. While Legitimacy Theory offers avenues for firms to adopt symbolic circularity measures in response to stakeholder scrutiny, it lacks explanatory power in contexts in which governance strategically integrates circularity as a fundamental operational paradigm rather than a reactive compliance measure to address long-term environmental issues. Rome (2021) argues that a firm's interest in sustainability commitment goes beyond regulatory compliance. Accordingly, this study contends that Stewardship Theory better explains the proactive governance of circularity by ensuring that stakeholders are committed to the firm's and society's long-term well-being, aligning strategic decisions with sustainability and value creation.

Stewardship theory underscores the pivotal role of robust CGOV frameworks in cultivating deeply embedded organizational commitment to corporate strategy (Jasir et al., 2023; Melis and Nijhof, 2018). Rather than merely enforcing compliance, effective governance mechanisms align corporate strategy with long-term ecological resilience, fostering an organizational ethos in which sustainability is an intrinsic, value-driven pursuit rather than an imposed obligation. This strategic alignment catalyses eco-adaptive behaviours, embedding sustainability as a core cultural norm rather than a peripheral initiative. Critically, such eco-adaptive behaviours act as the foundational drivers of regenerative business models, enabling firms to transition from linear business models to dynamic self-renewing ecosystems. Nevertheless, current governance structures adhere predominantly to linear economic paradigms characterised by "take-make-use-destroy", thereby constraining firms' ability to integrate circular principles as a strategic priority (Grafström and Aasma, 2021).

While Buchmann-Duck and Beazley (2020) emphasise the urgent necessity of adopting circular practices, a significant gap remains in understanding the intricate mechanisms by which corporate governance affects the successful implementation of circular supply chains. This gap is particularly pronounced in the waste management cultures of firms in developing economies, where challenges such as poor material segregation and limited reuse practices are prevalent. Alshawaf et al. (2025) note that these challenges are further compounded by infrastructural constraints and regulatory ambiguities, hindering the transition to circular models. Emerging research highlights the crucial roles of organizational readiness, culture, and leadership in driving strategic transformation; however knowledge of how these factors drive circular supply chain in the manufacturing sector of developing economies is limited. For example, Rudan (2023) illustrated that fostering a culture aligned with circular principles is essential for advancing circularity within the tourism sector. Similarly, Hu et al. (2024) identify sustainability-oriented leadership as a critical internal mechanism driving firms' eco-innovation strategies, although they acknowledge the lack of comprehensive studies in this area. In light of these insights, it is imperative to explore how corporate governance structures can effectively align with and enhance organizational culture and leadership to facilitate the adoption of circular supply chain practices, particularly in the manufacturing sectors of developing countries, where effective waste management remains a critical challenge. Addressing this multifaceted gap requires a holistic approach that integrates governance frameworks with cultural and leadership dynamics, thereby formulating actionable strategies that resonate with the operational realities of circular supply chains. CSCM is described as the deliberate and methodical process of "closing the loop" with the aim of achieving zero waste through seamless integration and optimisation of forward and reverse flows across various product lifecycles to enable the regeneration and restoration of the product cycle (Amir et al., 2023). Regenerative strategies entail the transformation of materials into novel forms or the optimisation of resource utilisation, particularly for items with limited lifespans, such as fast-moving consumer goods. Conversely, restorative approaches focus on the reclamation of materials, components, and products for subsequent applications (Ayati et al., 2022).

Based on this backdrop, this study examines the following research questions: 1. How does CGOV impact circular supply chain adoption, 2. How does eco-adaptive organizational culture mediate the link between CGOV and circular supply chain adoption, 3. How does leadership eco-innovative willingness moderate the link between CGOV and eco-adaptive organizational culture, 4. How does perceived urgency for circularity serve as a boundary condition to leadership eco-innovation willingness as a moderator on the association between CGOV and eco-adaptive organizational culture. To this end, eco-adaptive organizational culture is described as a cultural characteristic that facilitates the evolution and responsiveness of cultures to environmental conditions (Verdu-Jover et al., 2018), leadership eco-innovation willingness (LECOIN) is described as the broad inclination of leaders to embrace and implement strategies that support environmentally friendly initiatives (Pichlak and Szromek, 2021; Mignonac, 2008), and perceived urgency for circularity refers to the cognitive recognition of the imminent necessity to transition toward circular principles (Verleye et al., 2024; Zhu et al., 2018).

Drawing on data from manufacturing firms in Ghana (a developing sub-Saharan African country), this study examines the role of CGOV in promoting circular supply chains. Ghana's institutional hybridity, marked by the coexistence of formal regulatory frameworks and informal governance norms alongside persistent economic constraints and a developing manufacturing sector, reflects the structural and behavioural conditions common to many emerging economies. These contextual similarities render Ghana a theoretically and empirically relevant setting for examining circular economy transitions in similarly constrained environments (Agyemang et al., 2025; Ababio et al., 2023), thereby establishing it as a robust proxy for generalising insights to other developing nations that face analogous sustainability and governance challenges. Despite environmental policies such as the 1992 Constitution of Ghana (Section 41), Ghana Landfill Guidelines, and the Manual for the Preparation of District Waste Management Plans, effective waste management remains elusive (Sackey and Miezah, 2022; Sarfo-Mensah et al., 2019), as the region continues to suffer from severe environmental challenges. The gap between policy formulation and implementation suggests that regulatory mechanisms alone may not suffice to transition to a circular economy (Sarfo-Mensah et al., 2019). Yeboah-Assiamah et al. (2017) advocate for attitudinal and cultural change. This study explores how CGOV can bridge this gap in Ghana's circular economic transition. It examines how voluntary stewardship-driven governance models might be more effective than approaches focused solely on regulatory compliance. These findings provide insights into how firms can navigate institutional voids and use governance mechanisms to drive systemic circularity in resource-constrained economies.

The closest study in the literature to the present research is Awuah-Gyawu et al. (2025) which has used the same dataset to focus on the nexus between corporate governance practices and circular supply chain management with emphasis on leadership eco-innovation willingness and perceived urgency paradox based on a three-way interaction model. Hence, this study's investigation constitutes a component of a broader scholarly agenda aimed at examining the various dimensions of circular governance within resource-constrained environments. In essence, although this study uses the same data as in Awuah-Gyawu

et al. (2025), the two studies are independently conceptualised to pursue distinct theoretical trajectories. Contrary to Awuah-Gyawu et al. (2025), this study emphasises eco-adaptive organizational culture (EAOC) as a mediating mechanism and investigates the moderating roles of leadership eco-innovation willingness (LECOIN) and perceived urgency for circularity. By contrast, the Awuah-Gyawu et al. (2025) employs a three-way interaction model grounded in stewardship–Behavioural Alignment Theory (SBAT) to explore how eco-innovation leadership (EIL) mediates and moderates governance effectiveness in driving CSCM, with perceived urgency for circularity as a boundary condition to EIL as a moderator in the corporate governance-circular supply chain relationship. Together, these complementary yet non-overlapping studies provide a more comprehensive understanding of the governance–circularity nexus. While Awuah-Gyawu et al. (2025) focuses on activating governance through leadership mobilisation under conditions of urgency, the present study elucidates how cultural adaptability and organizational readiness sustain mobilisation. By addressing different facets of circular transition, these studies collectively enrich the theoretical and practical discourse on how firms in emerging economies can align strategic governance with operational sustainability.

This paper is organised as follows. Section 1 establishes the foundation for the study by situating corporate governance within the framework of circularity transitions, drawing on stewardship theory as a more comprehensive explanatory lens. Section 2 develops the conceptual framework and hypotheses by integrating insights into eco-adaptive organizational culture, leadership eco-innovation willingness, and perceived urgency of circularity. Section 3 outlines the methodological approach, detailing the empirical context, measurement strategy, and procedures used to ensure reliability and validity. Section 4 presents the findings derived from the SEM and the moderated mediation analysis. Section 5 offers a critical discussion of the results, highlight the theoretical and managerial contributions, and address the study's limitations while proposing directions for future research.

2. Theoretical perspective and hypotheses development

2.1. The stewardship theory

Stewardship theory posits that individuals are motivated to satisfy higher-order needs through behaviors that benefit the organization, thereby naturally aligning their interests with those of the organization and its principals (Lehrer and Segal, 2020).

The stewardship theory contends that managers are not primarily motivated by personal interests. Rather, they function as custodians whose objectives align with those of their principals, specifically the organisation's shareholders (Yin et al., 2024). This theory offers significant insights into the role of leadership and governance as custodians of organisational assets, emphasising long-term organisational objectives, societal and environmental benefits, and the broader interests of diverse stakeholders. Stewardship theory broadens the notion of "caring for others" by extending its scope beyond financial responsibilities to encompass a more holistic view of societal and environmental concerns (Murtaza et al., 2021).

Bennett et al. (2018) argue that stewardship is a fluid concept that can change over time. They highlight that various factors, including incentive frameworks, societal expectations, resource availability, and market forces, can influence an individual or organisation's ability and willingness to act as stewards. Accordingly, Lehrer and Segal (2020) highlight that stewards derive personal satisfaction from feeling accountable for some larger good than themselves. Stewardship-oriented individuals have socially minded behaviours rather than individualistic, self-serving characteristics (Lehrer and Segal, 2020). Subramanian (2018) contends that when an organisation's espoused values align with its operational practices, managerial stewardship behaviour contributes to exemplary CGOV standards. Consequently, it is pertinent to investigate the manner in which specific leadership attributes influence ecological stewardship behaviour to affect circular supply chain initiatives through CGOV. Applying this theory, we developed and tested a conceptual model that delineates the interplay between CGOV, EAOC and CSCM at varying levels of LECOIN and PURGENCY. As illustrated in Fig. 1, we propose that EAOC mediates the association between CGOV and CSCM, and that LECOIN influences the adoption of CGOV practices that drive CSCM under varying levels of PURGENCY in the context of manufacturing industry of developing countries. Based on this backdrop, this study hypothesizes that:

H1. *CGOV has a direct and positive effect on CSCM.*

2.2. The mediating role of eco-adaptive organizational culture

According to Wijethilake et al. (2023), organizational culture functions as a pivotal enabler, embedding the strategic ethos required to convert vision into a concrete action. Rather than merely serving as a passive backdrop, culture acts as a dynamic, self-sustaining system that shapes behaviour, aligns incentives, and intricately integrates strategic imperatives into the daily routines of the organisation. This unseen yet pervasive influence ensures that strategy is not simply imposed from above, but is internalised, embodied, and implemented at every organizational level. An effective organizational culture can function as a mechanism for adaptation by enabling members to identify environmental threats and promptly develop solutions to address them (Huzooree and Yadav, 2025). An eco-adaptive organizational culture, characterised by a stewardship orientation, ensures that circularity is embedded as a strategic priority rather than being perceived as a mere operational modification. This cultural evolution allows organisations to adopt closed-loop production systems, regenerative resource cycles, and systemic innovation, thereby integrating sustainability into the core of their strategic framework rather than treating it as an external obligation in an era defined by climate instability, resource depletion, and uncertainty. However, Costanza et al. (2016) emphasise the lack of clarity on the conceptualization and role of adaptive culture in driving firm sustainability. Eco-adaptive organizational culture describes the collective basic assumptions regarding environmental management and issues which pressure individuals to align with green cultural values (Kiefer et al., 2024). This study asserts that eco-adaptive organizational culture serves as a critical enabler, bridging the link between corporate governance and the successful adoption of circular supply chain management. Accordingly, this study hypothezes that:

H2. Eco-adaptive organizational culture intervenes the association between corporate governance and circular supply chain.

2.3. The moderating role of leadership eco-innovation willingness

Singha (2024) asserts that leadership plays a pivotal role in shaping strategic vision, influencing decision-making, ensuring cultural alignment, and fostering innovation, adaptability, and inclusivity. The implementation of sustainability-related initiatives requires corporate willingness to invest in environmentally friendly technologies and modify CGOV structures and systems (Villegas et al., 2023). Particularly in developing economies, where sociocultural and economic challenges are predominant, persuading stakeholders to embrace sustainability initiatives and investment remains a significant challenge because of the high initial cost and extended payback period (Dadzie et al., 2018). From a stewardship perspective, organisations that demonstrate willingness to embrace eco-innovation endeavour to modify their corporate strategy to enhance environmental sustainability (Hazarika and Zhang, 2019). Eco-innovation refers to innovative initiatives that advance environmentally friendly, green, and sustainable solutions (Janahi et al., 2021). Eco-innovative leaders go beyond regulatory compliance by engaging stakeholders to integrate sustainability into the organisation's vision and strategy. They reshape CGOV to include environmental considerations in decision-making, leading to policies that prioritise

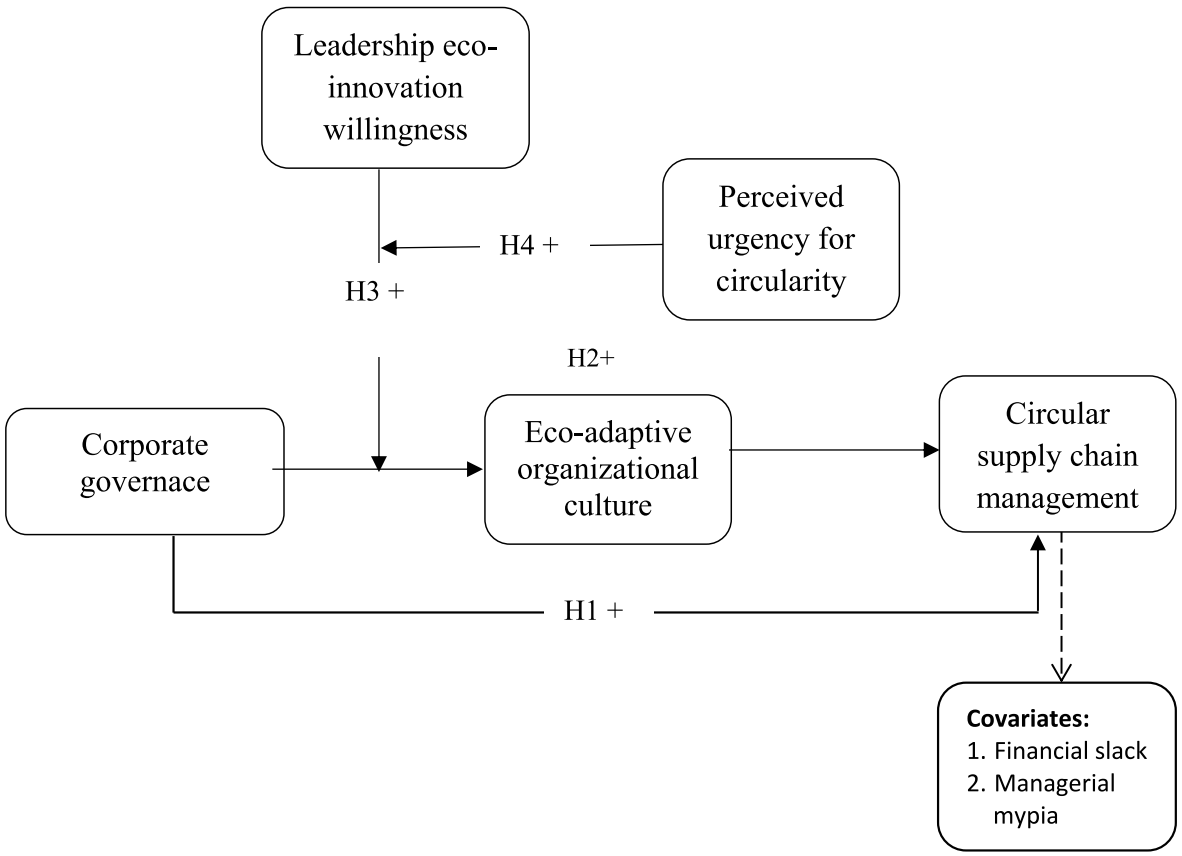

Fig. 1. Framework of the study based on Awuah-Gyawu et al. (2025)
Legend: ——→ Represent direct relationship
- - - - - - - - - - - - - - - - - - → Represent control path

sustainability, social responsibility, and long-term environmental goals. Rosokha and Younge (2020) highlight that variations in leaders' willingness to explore innovations with long-term benefits and uncertain prospects influence the impetus for sustainability innovations. Govindan and Jha (2024) highlight that lack of management support and willingness to share risks and benefits create barriers in circular innovation practices. Accordingly, Huang et al. (2024) stress that leaders' willingness to innovate is crucial for promoting novel initiatives. Ayati et al. (2022) argue that reluctance of firms to adapt circular supply chain business models is as a result of limited understanding of practitioners on the development and implementation of circular supply chain framework. From the perspective of stewardship, this study posits that increased willingness among leaders to engage in eco-innovation enhances their commitment to leading, institutionalising, and seamlessly integrating circularity-driven innovation into the organisation's strategic framework and cultural fabric. Accordingly, this study hypothesis that:

H3. LECOIN moderates the link between CGOV and Eco-adaptive organizational culture.

2.4. Perceived urgency for circularity as a boundary condition to leadership eco-innovation willingness

The term 'perceived urgency' describes the different degrees of signals that people (such as businesses, clients, staff, or managers) perceive to require a swift response (Hellier et al., 2002). Regardless of whether the deadline or risk is actually approaching, this sensation of urgency is often affected by how a situation is portrayed or understood. Although entrenched interests often motivate companies to make only gradual changes, the pressing nature of certain societal and ecological challenges demands a much quicker and more drastic shift in their approach (Hahn et al., 2015). Kish et al. (2021) emphasise that external shocks serve as innovation triggers that induce transformations to facilitate adaptation. For instance, the experience derived from the COVID-19 pandemic necessitated a shift towards localised sourcing and heightened awareness regarding the adoption of innovative solutions to enhance local supply chain resilience initiatives (Phillips et al., 2022; Bai et al., 2021). Furthermore, increasing consumer preference for environmentally sustainable products prompts organisations to expeditiously address these demands in order to maintain their competitive positions (Sawang et al., 2024). Stewardship-oriented leaders demonstrate an awareness of environmental crises, environmental regulations, and shifts in market trends for sustainable products. Consequently, PURGENCY is expected to drive the motivation to adopt environmental initiatives that help preserve both organisational and environmental well-being.

Fredberg and Pregmark (2016) stress that perceived urgency can have negative consequence. Fredberg and Pregmark (2022) also argue that, a sense of urgency can either facilitate or hinder change processes. However, this study contends that a sense of urgency is a crucial driver in changing management and organizational transformation to circularity adoption and implementation. To address this knowledge gap, particularly in the context of the manufacturing industry, this study examines the interplay between PURGENCY, EAOC, LECOIN, CGOV, and CSCM using a three-way interaction approach. Accordingly, this study hypothesizes that:

H4. *PURGENCY serves as a boundary condition to LECOIN as a moderator on the link between CGOV and CSCM.*

3. Methods of research

3.1. Study design and sample

This study's model was tested based on data drawn from firms operating within the manufacturing sector of Ghana (a developing country in sub-Saharan Africa). The slightest disruption in the global supply chain has severe socioeconomic consequences for developing economies; however, gaps in promoting resource utilisation through circularity persist because of a lack of waste infrastructure, limited awareness and education, financial constraints, scarce technical expertise, exceptionally hostile conditions for environmental considerations, and a lack of data and information on the mechanisms to realise the full potential of circularity (Azmi et al., 2024; Dankyira et al., 2024). These elements can shape leaders' perceptions and assessments of the exigency surrounding eco-innovation adoption signals. Stewardship theory should be considered as a contextual framework based on motivational assumptions. These assumptions have the potential to adjust, complement, or revolutionise existing agency-based governance practices (Torfing and Bentzen, 2020), particularly for firms in developing countries which often exhibit infrastructure deficiencies, inadequate legislation and policy frameworks, limited social awareness, and resource constraints, which may influence the willingness and priority to implement circular supply chain practices (Cantú et al., 2021).

Adomako and Nguyen (2024) highlight that the number of registered manufacturing firms in Ghana is approximately 1000. Hence, consistent with Dankyira et al. (2024), this study draws data from 535 firms in the manufacturing sector based on the database of Ghana Yellow Pages. Using Yamane's (1967) sample size table, for a population of 1000 firms, with a 5 per cent precision level and a 95 per cent confidence interval, a sample of 535 firms (Table 1 shows the demographic characteristics of selected firms) is considered representative to conduct a firm-level analysis. A pilot study revealed that several small- and medium-sized enterprises (SMEs) were not in operation; hence, consistent with Dornyei et al. (2007), this study used convenience sampling to select firms that have been in operation for the past three years and respondents with adequate experience, knowledge, and confidence in providing information needed for the study. Accordingly, chief executive officers, operations managers, supply chain managers, sustainability officers, and managing directors were selected as the informants. Of the 535 administered questionnaires, the researchers were able to retrieve 415 questionnaires within four weeks (Table 1). Of the 415 questionnaires, 34 were discarded because of incomplete responses. Consequently, useable responses were 381 questionnaires.

3.2. Measures of the substantive constructs

To enhance the reliability and validity of the measurement items in accordance with previous research (e.g. Awuah-Gyawu et al., 2024; Malhotra, 2023), this study adopted survey items from extant literature.

Table 1
Firm demographic characteristics.

Variable (N = 381)		Frequency (f)	Percentage (%)
Firm size	Micro	50	13.12
	Small	104	27.30
	Medium	214	56.17
	Large	13	3.41
Firm age	Less than 5 years	78	20.47
	5–10 years	147	38.58
	11–15 years	105	27.56
	Over 15 years	51	13.39
Industry	Food and Beverages	142	37.27
	Wood	81	21.26
	Plastics	63	16.54
	Textile and Apparel	95	24.93

Source: Authors' own construction based on Awuah-Gyawu et al. (2025).

To ensure contextual appropriateness and content validity of the questionnaire, a pilot test was conducted with six experts. This group included three senior academics specialising in sustainable supply chain management and corporate governance as well as three industry practitioners with over ten years of experience in manufacturing and circular economy implementation. The experts assessed the clarity, relevance, and contextual suitability of each item. Their feedback, which concentrated on terminological precision, cultural sensitivity, and operational alignment, was systematically integrated to refine the item wording, eliminate ambiguity, and enhance the overall coherence of the instrument prior to its final deployment. Measures of CGOV were drawn from the study by Wen et al. (2023), Kazemian et al. (2022) and Ali (2018). Eight question items were also selected from Farooque et al. (2022) to measure CSCM. All four items used to measure leadership co-innovation willingness were also adapted from Jun et al. (2021). Again, all the six items measuring eco-adaptive organizational culture were adapted from Madi Odeh et al. (2023) and Fraj et al. (2011). Finally, the five items for the PURGENCY were adapted from Nguyen et al. (2024). Exploratory factor analysis (EFA) was performed. Consistent with Hutcheson and Sofroniou (1999), who suggested that factor loadings should be 0.7 or above, this study dropped items CORP1, CORP2, CORP7, LECO1 which had factor loadings of 0.58, 0.53, 0.57 and 0.55, respectively, using the maximum likelihood extraction method. These items were not considered in further analysis.

3.2.1. Substantive variables

Table 3 shows the reliability and validity results of the substantive variables. A seven-point Likert scale (1 = strongly disagree to 7 = strongly disagree) was used to assess the items of the variables.

Corporate governance was operationalised as a framework that encompasses the processes and structures designed to control and direct organisations. It comprises a set of regulations that govern the interrelationships between management, shareholders, and stakeholders (Abdullah and Valentine, 2009). Contextual, resource availability, and environmental factors influence CGOV adoption and performance. Accordingly, Wen et al. (2023) found that the adoption and performance outcomes of good CGOV practices, such as the composition of the board of directors, audit systems, financial disclosure, and ownership characteristics, are influenced by international orientation. They suggest that firms with a global orientation frequently implement internationally recognised governance practices, drawing insights from efficacious models across various markets. This approach can engender enhanced levels of transparency, accountability, and ethical conduct within the organisation. While research is needed to explore how good CGOV practices drive firm performance, it is important to explore the factors that affect the adoption and impact of CGOV practices on circular supply chains in an era in which globalisation, environmental consciousness, and supply chain disruption are predominant.

Eco-adaptive organizational culture is defined as a dynamic and trust-based culture that encourages risk-taking and builds collective confidence in tackling environmental challenges (García-Granero et al., 2020; Costanza et al., 2016). This culture consistently incorporates sustainability-driven innovation into its fundamental strategic and operational frameworks. In recent years, the concept of eco-adaptive organizational culture has emerged as a compelling topic, representing the next phase of sustainability transformation. Febrian and Solihin (2024) highlight that an adaptive organizational culture promotes innovation-aligned values and behaviours that are seamlessly integrated with a firm's vision and strategy. This approach enables firms to integrate circularity, resilience, and long-term ecological responsibilities into their core operations. Organisations that foster such a culture are poised not only to endure but also to prosper amid environmental and economic disruptions, thereby shaping the future of regenerative and sustainable business models. However, Assoratgoon and Kantabutra (2023) emphasise that current research on sustainability-oriented culture is limited, as it predominantly focuses on cultural aspects that

enhance productivity rather than sustainability.

Circular supply chain management is operationalised as an economic framework integrated into supply chain management, founded on business paradigms that eschew the traditional 'end-of-life' approach by adopting restorative and regenerative system designs that minimise waste and maximise resource utilisation (Figge et al., 2023; Zhang et al., 2021). Saroha et al. (2018) emphasized that given the magnitude of the impact of climate change and environmental degradation, CSCM is the sole viable solution to ensure that products are utilised repeatedly until they are completely consumed within the supply chain. Agyabeng-Mensah et al. (2022) contend that firms who have high environmental orientation develop abilities and adopt innovations that promote circular supply chain initiatives. Circular supply chain architecture, which is fundamentally grounded in the tenets of a circular economy, resonates with the United Nations Sustainable Development Goals (SDGs). Emerging technologies, including blockchain, Internet of Things (IoT), and data analytics, are set to transform CSCM (Azmi et al., 2024).

Leadership eco-innovation willingness refers to the propensity of leaders to adopt novel approaches towards the development of products, processes, and business models that extend the useful life cycle of natural resources to mitigate the environmental impact of organisational operations (Zhao et al., 2024; Pichlak and Szromek, 2021; Mignonac, 2008). When organisational leaders embrace and champion eco-innovation, they cultivate an atmosphere of collective accountability for environmental stewardship, elevating staff morale and participation. Team members are more prone to take satisfaction in their roles and propose creative solutions, recognising their affiliation with a visionary enterprise that affects positive changes towards sustainable development.

Perceived urgency for circularity reflects a profound impetus to expedite the transition toward regenerative practices. This urgency is driven by the recognition of increasing environmental risks and transformative potential for enhancing resource efficiency and ensuring long-term resilience (Mitcheltree, 2023). The urgency of adopting circular economy principles has been underexplored in academic literature. While circularity is recognised as a sustainable alternative to the linear economy, discussions often focus on its implementation, consumer behaviour, and technological innovations, with limited emphasis on the urgent need to expedite this transition due to escalating environmental challenges. For instance, a review by Khan et al. (2022) highlights various circular economy practices but lacks focus on the immediacy required for their adoption. Bocken et al. (2016) stress the need for more thorough theoretical and empirical research on the psychological and strategic dimensions, especially regarding their influence on decision-making processes and the promotion of circular transitions.

3.2.2. Covariants

The resource-based view (Peteraf and Barney, 2003) suggests that financial slack and corporate foresight influence firm strategy. This study's framework therefore controls for financial slack and managerial myopia which can potentially influence the study's outcome. Financial slack refers to the surplus financial resources a firm has beyond its immediate operational needs, serving as a buffer for uncommitted, liquid resources for seizing opportunities, managing risks, or investing in innovation and strategic initiatives (Tran et al., 2018). All four items used to measure financial slack were drawn from Tran et al. (2018) using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). Again, managerial myopia represents a persistent perspective that restricts the range of alternatives available to decision makers, thereby hindering effective learning processes. The three items measuring managerial myopia were adapted from Manhal et al. (2023).

3.3. Survey bias evaluation

3.3.1. Non-response bias

Non-response bias occurs when individuals who participate in a survey differ significantly from those in the sampled population who do not respond in ways pertinent to the research objectives. Wagner and Kemmerling (2010) demonstrated that through a comparative analysis of responses from early and late respondents, the absence of statistically significant differences between these responses suggests that non-response bias did not influence the study. In accordance with Dankyira et al. (2024), responses were categorised into two distinct groups: early responses (those submitted within two weeks) and late responses (those submitted after two weeks). Based on the four substantive constructs and the two covariates (financial slack and managerial experience) of this study, an independent sample *t*-test revealed that differences between early and late responses were not statistically significant, indicating that non-response bias does not present a substantial concern in the study. For instance, the analysis revealed that the two-tailed significance of p-value, F-statistic, and lower and upper confidence intervals for managerial experience (quantified as the duration of managerial tenure within the industry) between early respondents (n = 182) and late respondents (n = 199) were 0.504, 0.335, and (−0.136, 0.276) respectively.

3.3.2. Common method bias

Common method bias was evaluated using multiple procedures, encompassing both ex-ante and ex-post approaches (Podsakoff et al., 2003). The researchers assured the respondents of the utmost confidentiality, with the results collected being anonymised and utilised solely for statistical and academic purposes. Furthermore, no questions were posed that could potentially reveal the identity of the respondent or the organisation they represented. The measurement items were adapted from prior studies and subsequently reviewed by six individuals from industry and academia. Their recommendations were subsequently utilised to refine the items to address specific measures of the variables, reflect the context of the study, and ensure precise and concise measurement items.

This study further obtained data on the respondents' interest, knowledge, and confidence in responding to the survey. The mean rating of these items on a seven-point Likert scale was 6 (very high), with a minimum rating of 4 and a maximum of 7 (See Table 2).

The EFA results reveal that, with eigenvalues greater than 1.00, 72.53 % of the variations in the dependent variable are accounted for by the independent variables. Harmans single factor test show that one factor only explained 19.95 % of the variations in the dependent variable which is below 50 % the threshold recommend by Podsakoff et al. (2003).

3.3.3. Validity and reliability

To ensure that the measurement items have high internal consistency, this study examined the reliability coefficient of measures based on Hair et al. (1998). Table 3 reveal that all the substantive constructs have satisfactory Cronbach's Alpha values ranging from 0.89 to 0.94 which are within the threshold suggested by Eiras et al. (2014). Convergent and discriminant validity were examined to satisfy that the measurement items uniquely measure their respective constructs and distinct from other constructs (Krabbe, 2016). Table 3 further reveals that the Average Variance Extracted (AVE) values were satisfactory (Hair et al., 2021). Following Fornell and Larcker (1981), this study

Table 2
Respondents' Competency analysis results.

Item	Min	Max	Mean	SD
The questionnaire contains issues we are knowledgeable about.	4	7	5.70	0.99
The questionnaire deals with issues that we are interested in.	4	7	5.87	0.89
We are confident that about our answers to the questions.	4	7	5.77	0.92

Source: Field study based on Awuah-Gyawu et al. (2025).

Table 3
Results of the measures' reliability and validity.

Code	Construct/Measures (Composite reliability/ Cronbach's alpha/Average variance)	Factor Loadings	t-value
Corporate governance. *For the past 3 years …* **(0.91/0.89/0.84)**			
CORP1	Our board of directors meet periodically per annum	–	–
CORP2	The board of directors set clear strategic goals	–	–
CORP3	My firm's operations are annually audited by an independent auditor	0.75	FIXED
CORP4	My firm prepares and disseminates its operational standards to relevant stakeholders	0.92	21.67
CORP5	Management of my firm ensures annual accountability of the use of resources	0.76	16.62
CORP6	The board of directors is composed of individuals from diverse backgrounds	0.94	22.38
CORP7	The board of directors ensure that stakeholders' interests are safeguarded	–	–
Eco-adaptive organizational culture. For the past 3 years … **(0.90/0.94/0.84)**			
EAOC1	Environmental considerations have been integral to the core activities of an organisation	0.74	25.17
EAOC2	Our company has been dedicated to ensuring that every employee understands the significance of environmental protection	0.75	24.45
EAOC3	My firm has been engaged in intra-organizational research aimed at identifying strategies to differentiate our products within the industry	0.94	64.78
EAOC4	My organisation has engaged in partnerships with external entities to develop and implement policies designed to provide long-term benefits to these entities	0.91	FIXED
Perceived Urgency for Circularity. *For the past 3 years …* **(0.94/0.94/0.87)**			
PURGE1	Our organisation possesses the cognition of stakeholder expectations regarding its sustainability practices	0.87	23.31
PURGE2	Our organisation demonstrates considerable need to integrate circularity principles into its operational framework	0.88	23.70
PURGE3	My firm challenges traditional supply chain operations by incorporating circularity	0.89	23.80
PURGE4	My firm knows that circular supply chain management is critical to success	0.86	FIXED
PURGE5	My firm has observed that its competitors have begun to incorporate circularity into their supply chains	0.87	23.42
Leadership eco-innovation willingness. *For the past 3 years* **(0.93/0.93/0.88)**			
LECO1	Our company shows commitment to assess its product designs to ensure that they are readily disassembled, re-purposed, and recycled	–	–
LECO2	Our company places strong emphasis on prioritising energy-efficient materials	0.82	20.18
LECO3	My company is eager to use raw materials that do not pollute the environment	0.90	25.11
LECO4	My firm embraces a manufacturing process that effectively reduces the emissions of hazardous substances or waste	0.94	26.37
LECO5	My organisation is committed to ensuring that raw materials are utilised judiciously in product development	0.85	FIXED
Circular Supply Chain Management. *For the past 3 years* **(0.91/0.93/0.79)**			
CIRC1	Our products are designed to enable recontextualization, restoration, and reprocessing	0.94	21.53
CIRC2	My firm requires major suppliers to use materials that have been repaired, refurbished, or recycled	0.71	15.76
CIRC3	My firm requires our primary suppliers to employ eco-friendly packaging materials.	0.80	17.75
CIRC4	When procuring products, our company considers the potential for water and energy conservation during usage.	0.78	17.84
CIRC5	Through the distribution network, our company retrieves products approaching the end of their lifecycle from consumers	0.78	17.74
CIRC6	Our firm collects expired or unsold products from distribution networks	0.75	FIXED
Financial Slack. For the past 3 years, my firm … **(0.94/0.95/0.89)**			
FSLACK1	Has maintained a stable financial standing	0.88	FIXED
FSLACK2	Has experienced minimal difficulty in securing monetary resources to sustain our market-related endeavours.	0.88	25.92
FSLACK3	Has maintained ample surplus funds	0.93	29.05
FSLACK4	Is able to obtain the required funds when necessary	0.86	24.89
Managerial Myopia. For the past 3 years, my firm …. **(0.91/0.93/0.88)**			
MM1	Has lacked an understanding of the operational mechanisms both within and outside the organisation	0.90	FIXED
MM2	Has systematically reduced its range of strategic options, consequently limiting its ability to make adaptive decisions	0.89	26.89
MM3	Has encountered challenges in comprehending the current organisation's decision-making processes.	0.85	24.92

Source: Field study (2024) and Awuah-Gyawu et al. (2025).

found that discriminant validity of the constructs exists (see Table 5). Fornell and Larcker (1981, p.91) suggest that: "each construct AVE (squared variance within) should be compared to the squared inter-construct correlation (as a measure of shared variance between constructs) of the same construct and all other reflectively measured constructs in the structural model". They suggest that the shared variance between all model constructs should be less than their AVEs (See Table 4). A comprehensive confirmatory factor analysis (CFA) estimation of the model was performed using AMOS version 24 statistical tool (see Fig. 2). The CFA results demonstrate satisfactory model fitness with RMSEA = 0.041, NFI = 0.96, TLI = 0.97, CFI = 0.98, RFI = 0.94, Chi-square = 628.99, Degree of freedom = 384 and p-value<0.0001. Prior studies highlight that RMSEA scores below 0.05 reflect a good model fitness. Moreover, NFI and TLI values exceeding 0.90 are considered to demonstrate a favourable fit (Gmel et al., 2019; Park, 2021; Liu et al., 2021).

4. Results of structural model analysis and hypotheses testing

This study's structural model was tested using covariance-based structural equation modelling (SEM). While ordinary least squares regression was used to test the baseline relationship, Hayes' Process Macros was used to examine the interaction effects based on Hayes' process Macros models one and three (See Table 5). The analysis was performed in two phases, Models 1 and 2. While Model 1 does not consider control variables, Model 2 examines the extent to which control variables influence the model.

Paolini et al. (2014) contend that the slope of an interaction plot indicates the magnitude of a moderator's effect. As shown in Fig. 3, the impact of CGOV on EAOC progressively intensified with increasing levels of LECOIN. At low levels of LECOIN, the relationship remains marginal; however, as LECOIN increases, the effect becomes significantly stronger, thereby demonstrating the role of LECOIN in this CGOV-EAOC relationship.

Fig. 4 shows that LECOIN exerts an insignificant moderating effect in the relationship between CGOV and CSCM, when PURGENT is low, but its amplifying effect becomes markedly stronger when urgency is high.

5. Discussion and implication of key findings

The findings demonstrate a direct and positive relationship between Corporate Governance (CGOV) and Circular Supply Chain Management (CSCM), with statistical significance ($p < 0.0001$, LLCI = 0.276, ULCI =

Table 4
Descriptive and correlation results.

	CGOV	CSCM	EAOC	LECOIN	PURGENT	FSLACK	MMYO	Mean	S.D
CGOV	0.84							5.14	1.10
CSCM	0.303**	0.79						6.14	2.10
EAOC	0.440**	0.286**	0.84					7.14	3.10
LECOIN	0.160**	0.113*	0.123*	0.88				8.14	4.10
PURGENT	0.008	−0.051	−0.068	0.043	0.87			9.14	5.10
FSLACK	0.231**	0.160**	0.206**	0.118*	0.096	0.89		10.14	6.10
MMYO	0.157**	0.269**	−0.038	0.044	−0.006	0.110*	0.88	11.14	7.10

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Field study based on Awuah-Gyawu et al. (2025).

Table 5
Results of main effects.

Effect paths	Model 1		Model 2	
Direct relationship	Unstandardized Coefficient (β)/*Effect* (R-square change)	T-value (LLCI, ULCI)/*P-Value*	Unstandardized coefficient (β)	T- Value (LLCI, ULCI)/P-Value
CGOV→CSCM (H1+)	0.405 (0.092)	6.19 (0.276, 0.533)/ *0.0001***		
Indirect path				
CGOV→ EAOC→CSCM (H2+)	*0.111*/(0.036)	(0.043, 0.187)		
Conditional Paths				
CGOV × LECOIN→EAOC	0.059	2.378 (0.102,0.108)/ *0.018**		
Effect of LECOIN at varied levels	**β**/Index (SE)	T-value (LLCI, ULCI)/p-value		
LECOIN at low level	0.336 (0.056)	5.739 (0.221, 0.451)/ *0.0001***		
LECOIN at moderate level	0.454 (0.047)	9.597 (0.361, 0.547)/ *0.0001***		
LECOIN at high level	0.513 (0.059)	8.686 (0.337, 0.629)/ *0.0001***		
Effect of PURENT at varied levels				
CGOV × LECOIN × PURGENT→EAOC	0.046/(0.015)	3.208 (0.018, 0.075)/ *0.002***		
PURGENT at low level	−0.038	0.289		
PURGENT at moderate level	0.018	0.499		
PURGENT at high level	0.101	0.0007***		
Conditional Indirect paths				
CGOV × LECOIN→EAOC→CSCM (H3: **not significant**)	0.152 (0.111)	(-0.004, 0.040)		
Effect of LECO at varied levels	Effect/Index(SE)	(LLCI, ULCI)		
LECO at low level	0.086 (0.022)	(-0.007,0.080)		
LECO at moderate level	0.086 (0.033)	(-0.011, 0.119)		
LECO at high level	0.117 (0.011)	(-0.004, 0.040)		
CGOV × LECOIN × PURGENT→EAOC→CSCM **(H4+)**	0.012 (0.006)	(0.0016, 0.0263)		
Effect of PURGENT at varied levels				
PURGENCY at low level	−0.009 (0.015)	−0.039, 0.023		
PURGENCY at moderate level	0.005 (0.012)	−0.016, 0.031		
PURGENCY at high level	0.026 (0.014)	0.005, 0.058		
Covariates				
FSLACK			0.074	2.54 (0.017,0.131)/0.012*
MMYO			−0.075	−2.639 (−0.131, −0.019)/ 0.009**

Note: CI= Confidence interval, *p < 0.05, **p < 0.001, ***p < 0.0001, firm age (FA), firm size (FS), Industry type (IT).
Source: Field study (2024)

0.533) (Table 5) which is consistent with Awuah-Gyawu et al. (2025). This aligns with Asensio-López et al. (2019), who emphasise the need for a clearer understanding of the link between corporate governance and innovation performance. While previous research, such as Al Rawaf and Alfalih (2023), has associated CGOV with sustainability innovations, our study specifically underscores its role in advancing CSCM. This is achieved by drawing on Stewardship Theory to provide a framework for understanding the CGOV-CSCM link, encompassing internal commitment and governance mechanisms that encourage managers to act as responsible stewards and integrating circular practices into the supply chain for organizational and societal benefits.

Second, this study reveals that in the manufacturing sectors of developing economies, eco-adaptive organizational culture (EAOC) is a critical conduit through which corporate governance (CGOV) influences circular supply chain management (CSCM) implementation. This finding highlights that, beyond governance structures, cultivating an environmentally responsive culture is essential for embedding circular practices into supply chain operations. This insight is particularly pertinent in developing countries, where manufacturing firms often encounter challenges, such as limited resources, infrastructural constraints, and regulatory complexities. In such settings, fostering an EAOC enables organisations to navigate these obstacles, facilitating the

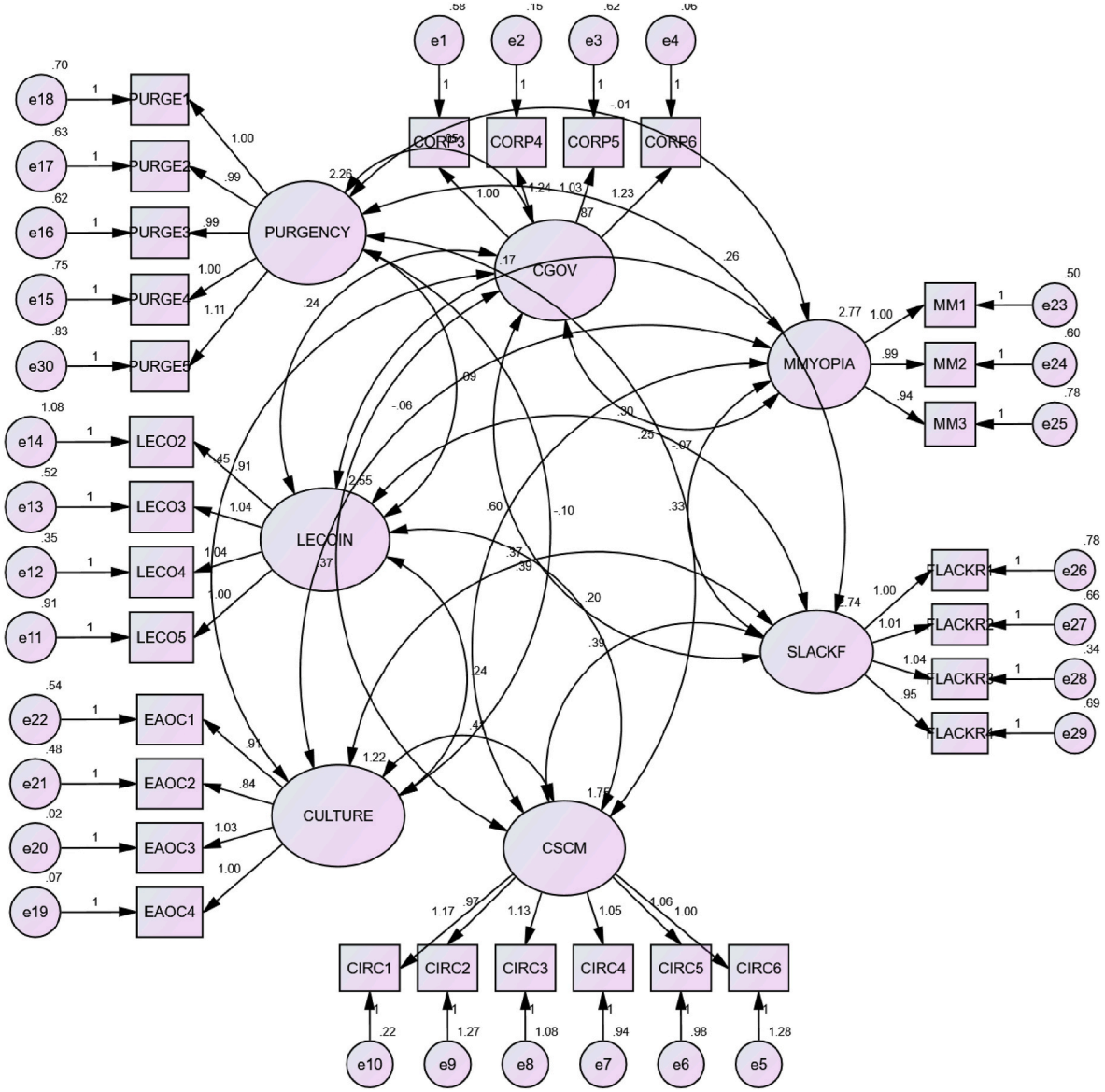

Fig. 2. CFA results: RMSEA = 0.041, TLI = 0.97, CFI = 0.98, RFI = 0.94, Chi-square = 628.99, Degree of freedom = 384 and p-value<0.0001.

adoption of innovative and sustainable CSCM practices. While previous research has established the importance of organizational culture in promoting circularity, this study emphasises EAOC's mediating role, specifically within developing economies' manufacturing industries. This underscores that in these contexts, corporate governance alone may not suffice to drive circular initiatives; rather, the synergy between governance and an eco-adaptive culture propels transformation in supply chain management. This perspective offers a nuanced understanding of how cultural adaptability intertwines with governance to foster sustainable practices, providing valuable insights for policymakers and industry leaders aiming to promote circular economies in developing regions.

Third, this study showed that LECOIN moderated the relationship between CGOV and EAOC. This aligns with Zhao et al. (2023), who noted that employees' willingness to participate in innovation affects a firm's innovation performance. Huang et al. (2024) also emphasized that willingness to innovate is crucial for fostering organizational innovation. The results also reveal that LECOIN does not moderate the indirect effect of CGOV on CSCM through EAOC (index of moderated mediation model = 0.152, LLCI = −0.0037, ULCI = 0.0396, SE = 0.111); hence, H3 is not supported. This suggests that, while LECOIN strengthens the direct path from CGOV to EAOC, it does not extend this to CSCM implementation. This divergence highlights the unresolved theoretical tensions between stewardship and legitimacy theories. Stewardship theory suggests that eco-innovative leaders foster internal cultural alignment, which may lack the systemic triggers necessary for the operationalisation of circular supply chains. In contrast, legitimacy theory posits that in low-pressure environments, symbolic eco-commitment may satisfy stakeholders without prompting the structural transformation required to convert eco-innovation intent into tangible circular supply chain management (CSCM) outcomes. This nuanced finding differentiates this study from prior research (eg. Irawan and Widodo, 2024), which found that environmentally conscious leadership drives circularity. The results imply that factors other than LECOIN may translate LECOIN and EAOC into effective CSCM practices, highlighting the need for further investigation of other contextual variables that aid the progression from organizational culture to tangible circular supply chain outcomes. This study suggests that the lack of a direct connection between LECOIN and CSCM likely indicates a disconnect between capability and action, where leadership intent alone is insufficient without the necessary technical expertise, cross-functional knowledge, and organizational preparedness to implement circularity.

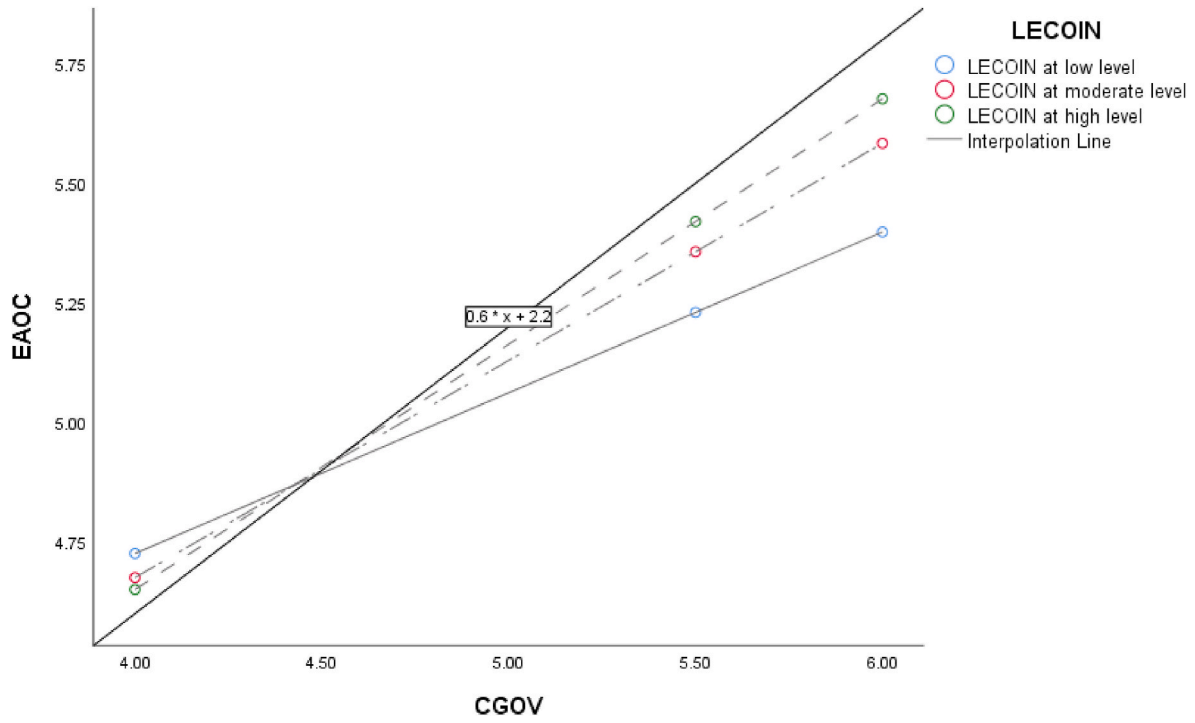

Fig. 3. The moderation effect of LECOIN in the relationship between CGOV and EAOC.

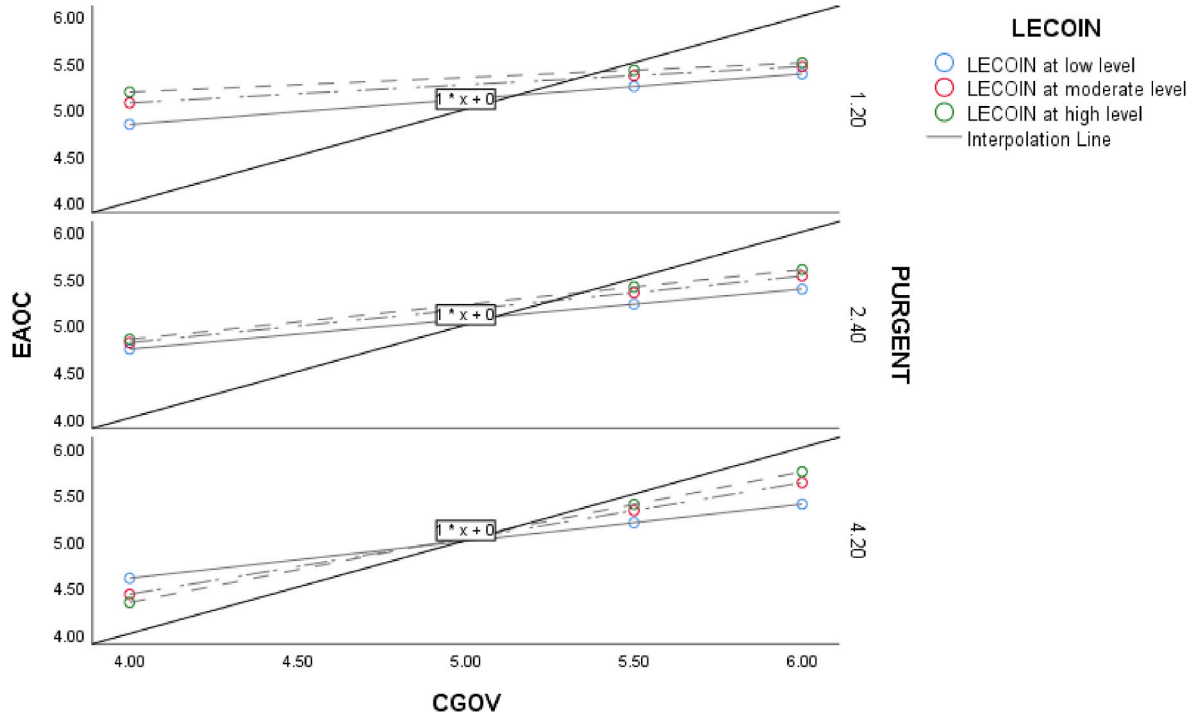

Fig. 4. PURGENT as a boundary condition to LECOIN as a moderator in the association between CGOV and CSCM
Legend: CGOV = corporate governance, CSCM= Circular supply chain management, LECOIN = Leadership eco-innovation willingness.

In resource-limited environments, this gap is exacerbated by weak institutional pressures and limited absorptive capacity, rendering the readiness for circularity ineffective in producing tangible circular supply chain management outcomes.

Fourth, based on a three-way interaction model, this study reveal that high levels of perceived urgency for circularity interacts with LECOIN to moderate the link between CGOV and CSCM (H4+). While Fredberg and Pregmark (2022) suggest that urgency can both facilitate and hinder change or innovation, the results of this study provide empirical evidence that in the context of the interplay between CGOV, CSCM, EAOC and LECOIN, PURGENCY strengthens the relationship (index of conditional moderated mediation = 0.012, LLCI = 0.0016, ULCI = 0.0263) (See Table 5). Hence, H4 is significant and positive. This study contributes to the existing literature by elucidating the synergistic

effects of LECOIN and PURGENCY, offering practical insights for organisations aiming to enhance their CSCM through strategic governance and proactive leadership, not based on mere compliance, but on stewardship.

Again, the results show that financial slack has a significant effect on the model ($\beta = 0.074$, $p < 0.012$, LLCI = 0.017, ULCI = 0.131); however, managerial myopia has a significant and negative effect on the model ($\beta = -0.075$, $p < 0.009$, LLCI = −0.131, ULCI = −0.019). Organisations possessing superior financial flexibility are better positioned to align their governance structures, leadership approaches, and external influences, thereby facilitating a more effective realisation of circular supply chain objectives. However, the effect of managerial myopia was found to have a negative effect on the model (p-value <0.009, LLCI = −0.131 and ULCI = −0.019).

5.1. Theoretical and managerial contribution

This study contributes three novel theoretical insights to the discourse on circular supply chain management (CSCM). First, it empirically positions corporate governance (CGOV) as a strategic lever rather than merely a structural apparatus for embedding circularity into organizational processes. This reframing advances existing scholarship (for example, Vuppuluri et al., 2024) by demonstrating that governance aligned with circular principles is not only associated with innovation and resilience but is also foundational to operationalising systemic sustainability transitions. Importantly, in contexts such as Ghana, where entrenched environmental degradation persists despite comprehensive regulatory instruments, our findings indicate that policy frameworks, while necessary, are insufficient without governance architectures that foster behavioural alignment. The evidence suggests a critical reorientation: CGOV must evolve from procedural compliance systems to behavioural governance systems that internalise circularity as normative organizational logic. Practically, this necessitates embedding circular accountability within governance infrastructure. Boards should codify circularity mandates through dedicated sustainability charters, integrate circular metrics into executive performance assessments, and establish audit subcommittees to monitor circular outcomes across supply chains. However, structural reform alone is inadequate in contexts marked by sociocultural inertia (Yeboah-Assiamah et al., 2017). Therefore, governance must be supplemented with culture-shaping interventions, such as participatory foresight labs, multi-stakeholder design sprints, and cross-functional circularity hubs, which embed circular thinking into organizational cognition and decision-making. In this integrated model, CGOV emerges not merely as an oversight tool but as an adaptive, value-infused catalyst for bridging the policy–practice gap and institutionalising circularity as a shared organizational ethos.

Second, this study highlights the critical role of EAOC as a mediator on the association between CGOV and CSCM. This indicates that governance alone may be inadequate to promote circularity without fostering an appropriate cultural mindset within an organisation. This is consistent with Sulistiawati (2025) who stress on the key role of organizational culture as a promoter of firm strategy. This findings suggest that a corporate culture that is adaptable and forward-thinking embrace environmental innovations that drive CSCM.

Third, this study revealed that varying levels of LECOIN affected the relationship between CGOV and EAOC. However, this influence does not necessarily extend to CSCM promotion. While this study encourages managers to demonstrate their commitment to adopting eco-friendly practices by allocating resources to the research and development of appropriate innovations, it is important to note that ecological principles emphasise the significance of environmental awareness, conservation, and pollution mitigation, often embodying the overarching goals of environmental stewardship. By contrast, circularity principles are more systemic and operational, requiring the redesign of supply chains, product life cycles, and resource loops to eliminate waste and regenerate value. Consequently, although eco-innovation leadership may promote cultural adaptation towards environmental accountability (EAOC), it may lack the specificity or technical alignment necessary to facilitate the complex structural transformations essential for CSCM.

Fourth, this study demonstrates that varied levels of PURGENCY interact with LECOIN to strengthen CGOV's effect on CSCM through EAOC, suggesting that PURGENCY serves as a strategic accelerator to deepen the knowledge of how CGOV drives culture and circularity outcomes. This study broadens the knowledge of the willingness-urgency paradox by emphasising PURGENCY's role in driving CSCM. This finding indicates that eco-innovation leadership's effectiveness varies across contexts, with the impact enhanced when leaders recognise circularity as an urgent strategic priority. For managers, this highlights the necessity of fostering collective urgency within leadership teams in order to transcend symbolic sustainability. Without a compelling internal narrative or belief in the immediacy of circular transformation, eco-innovation leadership may not translate into systemic supply chain change. Organisations must operationalise PURGENCY through internal communications, performance incentives, and strategic foresight initiatives to leverage corporate governance mechanisms and cultivate cultures that facilitate large-scale circularity.

5.2. Limitations and conclusions

CGOV is pivotal in driving the supply chain management literature and its practical application. However, there is a dearth of research on its effect on CSCM, particularly on the mechanism through which this relationship occurs. This study highlights EAOC, LECOIN and PURGENCY as critical variables that explain this relationship by drawing data from firms within the manufacturing sector of Ghana (a developing country in sub-Saharan Africa). However, the findings of this study must be explained in the context of theoretical and empirical limitations.

First, CGOV was operationalised as a system encompassing the mechanisms and organisational structures aimed at managing and guiding companies. Although this concept is complex, this study conceptualised it as a unidimensional construct. Future studies may therefore explore the effects of the unique dimensions of CGOV on circular supply chains to guide resource allocation, research, and broad managerial decision-making.

Second, readiness and willingness are closely related, but distinct concepts, particularly when discussing organizational innovation and decision-making. Consequently, Kruglanski et al. (2014) introduced the concept of motivational readiness to underscore the importance of these related but distinct concepts in promoting the realisation of a strategy. Future studies can explore what constitutes firm eco-innovation readiness and how it interacts with firm eco-innovation willingness to promote CSCM.

This study utilised a cross-sectional survey design, which carries a notable drawback in the form of common source (or rater) bias, potentially affecting estimates and statistical inferences-. To overcome this limitation, future investigations should adopt a longitudinal survey approach. Lastly, future research should prioritise the use of qualitative methodologies to explore the intricate relationship between "willingness" and "readiness" in the development of circular supply chains. This approach clarifies how leadership intent is either facilitated or hindered by organizational capabilities, cultural receptivity, and systemic preparedness; factors that are often overlooked in quantitative analyses within the circularity literature.

CRediT authorship contribution statement

Osman Babamu Halidu: Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Data curation, Conceptualization. **Meshach Awuah-Gyawu:** Writing – review & editing, Writing – original draft, Validation, Supervision, Investigation, Formal analysis, Conceptualization. **Alexander Otchere Fianko:** Writing – original draft, Validation, Supervision, Methodology, Formal

analysis, Conceptualization. **Bright Akwasi Gyamfi:** Writing – review & editing, Writing – original draft, Validation, Supervision, Formal analysis, Conceptualization. **Simplice A. Asongu:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis.

Ethical approval and consent to participate

This article does not contain any studies with human participants or animals performed by the authors.

Consent to Participate

Not applicable.

Consent to Publish

Not applicable.

Availability of data and materials

The data for this paper is available upon request.

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Declaration of competing interest

The authors have no conflict of interest to declare.

Data availability

Data will be made available on request.

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