



Environmental Management Accounting and Sustainable Banking Performance: A Systematic Literature Review of Green Innovation, Contingency Factors, and Organizational Effectiveness

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Abstract: This study presents a qualitative Systematic Literature Review (SLR) examining the role of Environmental Management Accounting (EMA) in enhancing Sustainable Banking Performance through Green Innovation, Contingency Factors, and Organizational Effectiveness. Following the PRISMA 2020 guidelines, peer reviewed studies published in reputable international journals were systematically identified, screened, and synthesized. The review reveals that EMA has evolved into a strategic management accounting system that supports environmental decision-making, resource efficiency, ESG implementation, and sustainable finance. The findings indicate that Green Innovation strengthens the effectiveness of EMA by fostering sustainable financial products and operational improvements, while Contingency Factors including organizational size, environmental strategy, regulatory pressure, and managerial commitment influence successful EMA implementation. Furthermore, Organizational Effectiveness mediates the relationship between EMA and Sustainable Banking Performance by improving strategic capability, innovation, and operational efficiency. This review contributes an integrated conceptual understanding of sustainable banking and provides practical implications for managers, regulators, and policymakers seeking to advance sustainability-oriented banking practices.

Keywords: Environmental Management Accounting; Sustainable Banking Performance; Green Innovation; Contingency Factors; Organizational Effectiveness.

1. Introduction

The growing urgency of climate change, environmental degradation, and increasing stakeholder expectations has transformed sustainability from a voluntary corporate initiative into a strategic imperative across industries, including the banking sector. Financial institutions are no longer evaluated solely based on profitability but also on their contributions to environmental stewardship, social responsibility, and long term economic sustainability. Banks play a critical role in supporting sustainable development by directing financial resources toward environmentally responsible investments, promoting green financing, managing environmental risks, and integrating Environmental, Social, and Governance (ESG) principles into their strategic decision-making processes. Consequently, sustainable banking performance has emerged as an important indicator of organizational success, reflecting not only financial outcomes but also environmental and social value creation (Weber, 2017; Driessen, 2021).

The transition toward sustainable banking has accelerated significantly over the past decade, driven by international initiatives such as the Paris Agreement, the United Nations Sustainable Development Goals (SDGs), and increasing regulatory requirements regarding climate related financial disclosures. Financial institutions are expected to improve transparency, reduce environmental risks, and develop innovative financial products that support sustainable development. Green banking initiatives including green loans, sustainable investment portfolios, green bonds, and environmentally responsible financing have become essential strategic priorities for commercial banks worldwide (Flammer, 2021; Fatica et al., 2021). Nevertheless, achieving sustainable banking performance requires more than the

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implementation of green financial products. It requires effective internal management systems capable of integrating environmental information into organizational planning, control, and strategic decision making. Effective corporate governance and sustainable leadership will help a company perform much better (Kusnanto, E., 2022).

One of the most important management tools supporting organizational sustainability is Environmental Management Accounting (EMA). EMA refers to the identification, collection, analysis, and use of both physical and monetary environmental information to support managerial decision-making, improve resource efficiency, reduce environmental costs, and enhance organizational performance (IFAC, 2005; Burritt et al., 2002). Since its introduction by Bartolomeo et al. (2000), EMA has evolved from a cost-accounting approach into a comprehensive strategic management system that assists organizations in balancing financial performance with environmental responsibility. Contemporary EMA not only measures environmental costs but also facilitates environmental planning, sustainability reporting, risk management, and strategic innovation (Schaltegger & Burritt, 2017). Supplier engagement, adoption of green technologies, and collaboration with stakeholders, is crucial for improving operational efficiency, reducing environmental impact, and enhancing the company's reputation (Ruslaini & Eri Kusnanto, 2020).

Previous empirical studies consistently demonstrate that EMA contributes significantly to organizational performance by improving environmental efficiency, supporting innovation, and strengthening strategic decision-making. Deb et al. (2023) found that EMA positively influences both environmental and financial performance through better environmental cost management and operational efficiency. Similarly, Sari et al. (2021) reported that process innovation mediates the relationship between EMA practices and organizational performance, indicating that accounting information can stimulate continuous organizational improvement. More recently, Nguyen Kim Quoc and Duong Thi Thuy (2025) revealed that EMA plays a significant mediating role between environmental strategy, organizational characteristics, green innovation, and bank performance in Vietnam, highlighting the strategic importance of EMA in sustainable banking development. An effective internal governance structure, including the role of the Sharia Supervisory Board, accountability, transparency, and inclusive management, significantly enhances human capital, structural capital, and relational capital (Chaidir, M., et al, 2024).

Despite growing recognition of EMA, its implementation remains contingent upon various organizational and environmental conditions. Contingency Theory suggests that there is no universally optimal management accounting system; rather, the effectiveness of management accounting depends on contextual factors such as organizational size, organizational structure, environmental uncertainty, competitive intensity, industry characteristics, and strategic orientation (Chenhall, 2009; Cadez & Guilding, 2008). Christ and Burritt (2013) further argue that contingent variables significantly influence the adoption and effectiveness of EMA practices because organizations respond differently to institutional pressures, stakeholder expectations, and environmental challenges. Consequently, organizations operating under dynamic environmental conditions require more sophisticated accounting systems capable of providing relevant environmental information for strategic decision making.

Among these contingency factors, environmental strategy has received considerable scholarly attention. Organizations adopting proactive environmental strategies tend to invest more heavily in environmental management systems, sustainable technologies, and environmental accounting practices, thereby improving both environmental and financial performance (Latan et al., 2018; Adomako et al., 2021). Likewise, organizational characteristics including organizational size, decentralized structures, managerial commitment, and organizational learning capabilities have been found to facilitate the successful implementation of EMA (Abdel-Kader & Luther, 2008; Ferreira et al., 2010). Larger organizations generally possess greater financial resources, technological capabilities, and institutional support for implementing sophisticated environmental accounting systems than smaller organizations.

Another important determinant of sustainable banking performance is green innovation, which refers to the development of environmentally friendly products, services, technologies, and organizational processes that reduce environmental impacts while simultaneously creating competitive advantages. Green innovation enables organizations to improve operational efficiency, reduce waste, minimize resource consumption, and strengthen their environmental reputation (Amores-Salvadó et al., 2015). Previous studies have consistently reported positive relationships between green innovation and organizational competitiveness

(Ar, 2012), environmental performance (Woo et al., 2014), and financial performance (Begum et al., 2022). Furthermore, environmental management accounting provides the environmental information necessary for identifying innovation opportunities, evaluating environmental investments, and measuring sustainability outcomes (Ferreira et al., 2010). Therefore, EMA and green innovation should be viewed as complementary organizational capabilities that jointly contribute to sustainable organizational performance.

Within the banking sector, green innovation extends beyond technological improvements to include sustainable financial products, digital banking services that reduce environmental footprints, climate-risk assessment models, and innovative green financing mechanisms. The emergence of sustainable finance, ESG investing, green bonds, and environmentally responsible lending has fundamentally transformed banking business models worldwide (Bolton & Kacperczyk, 2021; Nguyen et al., 2023). Consequently, banks increasingly require integrated accounting systems capable of measuring environmental costs, monitoring sustainability performance, and supporting strategic resource allocation toward environmentally responsible investments.

Although numerous empirical studies have investigated the relationship between EMA and organizational performance, the existing literature remains fragmented across industries, countries, and theoretical perspectives. Most previous research focuses on manufacturing industries (Deb et al., 2023; Doan et al., 2023; Kong et al., 2022), while comparatively limited attention has been given to the banking sector despite its increasing importance in achieving sustainable economic development. Furthermore, previous studies often examine individual relationships such as EMA and firm performance, green innovation and financial performance, or contingency factors and accounting practices without integrating these variables into a comprehensive conceptual framework. As a result, current knowledge regarding how contingency factors influence sustainable banking performance through EMA and green innovation remains fragmented and inconclusive.

Recent empirical evidence further suggests that contextual differences across countries influence EMA implementation and sustainable banking practices. Nguyen Kim Quoc and Duong Thi Thuy (2025) demonstrated that environmental strategy, organizational structure, organizational size, industry characteristics, and green innovation significantly affect bank performance through the mediating role of EMA in Vietnam. Nevertheless, similar evidence remains scarce across different institutional settings, indicating the need for a broader synthesis of existing studies to identify consistent findings, theoretical developments, methodological trends, and future research opportunities.

Given these inconsistencies, a Systematic Literature Review (SLR) provides an appropriate methodological approach for synthesizing existing empirical evidence, identifying theoretical foundations, evaluating methodological developments, and revealing research gaps within the literature. Compared with traditional narrative reviews, SLR offers greater transparency, methodological rigor, and reproducibility by systematically identifying, screening, evaluating, and synthesizing high-quality academic studies. Through this approach, researchers can develop a comprehensive understanding of how Environmental Management Accounting, green innovation, contingency factors, and organizational effectiveness collectively contribute to sustainable banking performance.

Therefore, this study aims to systematically review the existing literature concerning the relationships among Environmental Management Accounting, green innovation, contingency factors, organizational effectiveness, and sustainable banking performance. Specifically, the review seeks to identify dominant theoretical perspectives, summarize empirical findings, evaluate methodological approaches, reveal inconsistencies in current knowledge, and propose future research directions that can strengthen the implementation of EMA as a strategic management tool for achieving sustainable banking performance in an increasingly complex environmental and institutional landscape.

2. Literature Review

Environmental sustainability has become one of the most important strategic priorities for organizations worldwide, particularly within the financial services sector. Banks are increasingly expected to integrate environmental considerations into their operational and strategic activities to support sustainable economic development while maintaining financial stability. As environmental regulations become stricter and stakeholders demand greater corporate accountability, Environmental Management Accounting (EMA) has emerged as a strategic management tool that enables organizations to integrate environmental information

into managerial decision-making. According to the International Federation of Accountants (IFAC, 2005), EMA involves the identification, collection, analysis, and utilization of both physical and monetary environmental information to improve internal decision-making and organizational sustainability. Earlier studies by Bartolomeo et al. (2000) and Burritt et al. (2002) further explain that EMA extends conventional management accounting by incorporating environmental costs, resource consumption, waste management, and environmental performance indicators into organizational planning and control systems.

The theoretical foundation of EMA is strongly associated with Contingency Theory, which argues that no single management accounting system is universally effective because organizational performance depends on contextual factors such as organizational size, environmental uncertainty, organizational structure, technology, and competitive strategy (Chenhall, 2009; Cadez & Guilding, 2008). Christ and Burritt (2013) emphasize that the adoption and effectiveness of EMA vary according to organizational circumstances, indicating that environmental accounting practices should be aligned with both internal organizational characteristics and external environmental conditions. Similarly, Qian and Burritt (2009) argue that contingency variables determine the design of environmental accounting systems and influence managerial responses to environmental challenges. These theoretical perspectives explain why organizations implement EMA differently despite facing similar environmental pressures.

A considerable body of empirical literature has demonstrated the positive contribution of EMA to organizational sustainability and financial performance. Deb et al. (2023) examined manufacturing firms in Bangladesh and found that EMA significantly improves both environmental performance and financial performance by increasing resource efficiency, reducing environmental costs, and supporting strategic environmental decision-making. Likewise, Kong et al. (2022) reported that institutional pressure and environmental uncertainty encourage organizations to implement EMA, which subsequently enhances corporate environmental performance. Similar findings were reported by Nzama et al. (2022), who concluded that EMA practices significantly improve pollution control and environmental management effectiveness within manufacturing firms. These findings collectively indicate that EMA serves as an important mechanism through which organizations achieve sustainability objectives while simultaneously improving organizational competitiveness.

Within the banking industry, the role of EMA has become increasingly important because financial institutions face growing expectations regarding sustainable finance, climate-risk management, and ESG implementation. Unlike manufacturing organizations that directly generate environmental impacts, banks influence sustainability indirectly through financing decisions, investment portfolios, and environmental risk assessments. Weber (2017) argues that banks integrating sustainability into their strategic management achieve superior long-term financial performance while improving stakeholder confidence. Similarly, Driessen (2021) explains that sustainable finance requires financial institutions to develop internal information systems capable of evaluating environmental risks and supporting sustainable investment decisions. Therefore, EMA provides banks with systematic environmental information necessary for integrating sustainability into strategic planning and operational management.

Recent empirical evidence specifically examining banking institutions further strengthens the strategic importance of EMA. Nguyen Kim Quoc and Duong Thi Thuy (2025) investigated commercial banks in Vietnam using Partial Least Squares Structural Equation Modeling (PLS-SEM) involving 315 respondents. Their findings demonstrate that environmental strategy, organizational structure, industry characteristics, organizational size, and green innovation significantly influence bank performance through the mediating role of Environmental Management Accounting. The study concludes that EMA functions as a strategic mechanism that translates organizational capabilities into improved banking performance while simultaneously supporting sustainable development objectives. Furthermore, the authors recommend that policymakers strengthen environmental regulations and institutional support to accelerate EMA implementation within the banking industry.

Another important construct closely associated with EMA is green innovation. Green innovation refers to the development of environmentally friendly products, technologies, operational processes, and organizational practices that minimize environmental impacts while improving organizational competitiveness (Amores-Salvadó et al., 2015). Unlike conventional innovation, green innovation simultaneously creates economic value and

environmental benefits by reducing pollution, increasing energy efficiency, and optimizing resource utilization. Ar (2012) found that green product innovation significantly improves competitive capability and firm performance, particularly when supported by strong managerial environmental commitment. Likewise, Woo et al. (2014) demonstrated that green innovation positively affects labor productivity and organizational competitiveness in manufacturing industries. These findings suggest that innovation directed toward environmental sustainability constitutes an important strategic capability for long-term organizational success.

Environmental Management Accounting plays a significant role in facilitating green innovation because organizations require accurate environmental information to evaluate environmental investments, measure resource efficiency, and identify innovation opportunities. Ferreira et al. (2010) concluded that organizations utilizing EMA are more likely to generate environmental innovations because environmental information improves managerial understanding of resource consumption and environmental costs. Similarly, Agustia et al. (2019) found that EMA significantly mediates the relationship between green innovation and firm value, indicating that environmental accounting enhances the economic benefits generated by innovation activities. Chaudhry et al. (2020) also demonstrated that environmental strategy and EMA jointly strengthen the relationship between environmental innovation and financial performance, highlighting the complementary relationship between accounting information and sustainable innovation.

Recent studies continue to support the integration between environmental strategy, EMA, and green innovation. Gunarathne et al. (2023) argue that successful environmental strategies require effective integration with Environmental Management Accounting to transform sustainability objectives into measurable managerial actions. Likewise, Begum et al. (2022) found that green leadership stimulates green product and process innovation through employee creative engagement, suggesting that organizational commitment enhances innovation capability. Yang et al. (2019) further explain that environmental strategy, institutional pressures, and innovation capability collectively improve organizational sustainability and competitive performance. Collectively, these findings indicate that EMA provides the informational foundation upon which green innovation can be effectively implemented.

Contingency Theory provides an important theoretical explanation regarding why EMA adoption differs across organizations. According to Abdel-Kader and Luther (2008), organizational characteristics including firm size, organizational structure, management style, and technological complexity significantly influence management accounting practices. Larger organizations generally possess greater financial resources, technological capabilities, and managerial expertise, enabling more comprehensive EMA implementation than smaller organizations. Similarly, Doan et al. (2023) found that organizational commitment, environmental uncertainty, governmental regulations, and managerial awareness significantly affect EMA implementation within Vietnamese manufacturing enterprises. Nguyen (2022) likewise reported that environmental regulations, top management commitment, organizational size, and stakeholder pressure positively influence EMA adoption. These empirical findings reinforce Contingency Theory by demonstrating that organizational context determines the effectiveness of environmental accounting systems.

Organizational effectiveness represents another critical outcome associated with EMA implementation. Organizational effectiveness refers to the organization's ability to achieve strategic objectives efficiently while adapting successfully to environmental changes. Aponte and Zapata (2013) emphasize that organizational learning facilitates continuous improvement and organizational adaptability, thereby enhancing long term effectiveness. Turi and Sorooshian (2019) further argue that organizational structure influences organizational learning capability, which subsequently determines organizational effectiveness. Zeng et al. (2017) found that organizational context significantly influences quality management practices and innovation performance, suggesting that organizational effectiveness depends upon managerial capability, organizational flexibility, and continuous learning.

Several empirical studies have confirmed the relationship between EMA and organizational effectiveness. Sari et al. (2021) found that process innovation mediates the relationship between Environmental Management Accounting practices and organizational performance, indicating that organizations implementing EMA become more capable of improving operational efficiency and organizational effectiveness. Similarly, Le et al. (2019) reported that EMA significantly improves performance efficiency within Vietnamese construction material companies by enhancing managerial decision-making and

environmental resource allocation. Prasetya and Safitri (2023) further demonstrated that EMA positively influences financial performance through improvements in working capital management, highlighting the broader managerial benefits of environmental accounting beyond environmental performance alone.

The concept of sustainable banking performance has evolved beyond traditional financial indicators to include environmental responsibility, stakeholder satisfaction, ESG implementation, and long-term organizational resilience. Weber (2017) argues that sustainable banking integrates financial profitability with environmental sustainability and social responsibility, thereby improving organizational competitiveness. Nguyen et al. (2023) further demonstrate that Vietnamese commercial banks increasingly adopt green financing initiatives to support sustainable development while strengthening organizational performance. Moreover, Phan (2024) emphasizes that promoting green banking practices enhances sustainable economic development by encouraging environmentally responsible lending and investment activities.

Despite substantial progress in the literature, several research gaps remain evident. First, most EMA studies have focused predominantly on manufacturing industries, whereas empirical evidence from the banking sector remains relatively limited. Second, previous studies generally investigate direct relationships between EMA and organizational performance without comprehensively integrating green innovation, contingency factors, organizational effectiveness, and sustainable banking performance into a unified conceptual framework. Third, existing findings remain fragmented across countries and institutional settings, making it difficult to establish a comprehensive understanding of how EMA contributes to sustainable banking performance under different environmental and organizational conditions. Finally, recent evidence provided by Nguyen Kim Quoc and Duong Thi Thuy (2025) highlights the importance of integrating contingency factors and green innovation through the mediating role of EMA; however, systematic synthesis of these relationships across the broader literature remains scarce.

Therefore, a qualitative Systematic Literature Review (SLR) is essential to synthesize existing empirical evidence, identify dominant theoretical perspectives, evaluate methodological developments, compare findings across industries and countries, and formulate a comprehensive conceptual framework explaining how Environmental Management Accounting, green innovation, contingency factors, and organizational effectiveness collectively influence sustainable banking performance. Such a review is expected to provide valuable theoretical contributions to the management accounting and sustainable finance literature while offering practical recommendations for banking managers, regulators, and policymakers seeking to strengthen sustainability-oriented banking strategies.

3. Method

This study employed a qualitative research approach using the Systematic Literature Review (SLR) method to synthesize and critically evaluate the existing body of knowledge regarding the relationships among Environmental Management Accounting (EMA), Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. A Systematic Literature Review is an evidence-based research method that identifies, evaluates, and synthesizes previous empirical studies through a transparent, rigorous, and reproducible process. Compared with traditional narrative reviews, SLR minimizes researcher bias by following predefined review protocols and explicit inclusion and exclusion criteria, thereby improving the reliability and validity of research findings (Page et al., 2021).

The methodological procedures adopted in this study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines proposed by Page et al. (2021). PRISMA 2020 provides internationally recognized reporting standards consisting of four major stages: identification, screening, eligibility, and inclusion, ensuring transparency and reproducibility throughout the review process. Furthermore, PRISMA facilitates comprehensive documentation of search strategies, article selection, quality assessment, and evidence synthesis, making it one of the most widely accepted methodological frameworks for systematic literature reviews across management, accounting, and sustainability research.

This research adopted an interpretivist qualitative paradigm, emphasizing the interpretation and synthesis of findings from previous empirical studies rather than statistical aggregation. The objective was not to estimate effect sizes but to identify dominant research

themes, theoretical perspectives, methodological trends, empirical findings, inconsistencies, and future research opportunities concerning Environmental Management Accounting and sustainable banking performance. Accordingly, qualitative thematic synthesis was considered appropriate because it enables researchers to integrate evidence originating from different countries, industrial sectors, and methodological approaches into a coherent conceptual understanding.

The literature search was conducted systematically using internationally recognized academic databases that index peer-reviewed journals with high scientific credibility. The primary databases for supplementary searches. The databases were selected because they provide comprehensive coverage of accounting, finance, sustainability, and management literature.

The search strategy combined Boolean operators ("and" and "or") with predefined keywords derived from the research objectives. The principal search string included: "environmental management accounting" or "ema") and ("sustainable banking performance" or "bank performance") and ("green innovation") and ("contingency theory" or "contingency factors") and ("organizational effectiveness"). Additional combinations and synonymous terms were employed to maximize the retrieval of relevant publications while minimizing the omission of significant studies. The search strategy was iteratively refined following the recommendations of PRISMA 2020 to ensure completeness and transparency.

To ensure the quality and relevance of the reviewed literature, explicit inclusion and exclusion criteria were established before the screening process. The inclusion criteria consisted of: Peer-reviewed journal articles published in English. Studies published between 2015 and 2025, with particular emphasis on recent publications from 2020–2025. Empirical and conceptual studies discussing Environmental Management Accounting, Green Innovation, Sustainable Banking, Organizational Effectiveness, Contingency Theory, environmental strategy, or sustainable organizational performance. Articles indexed in reputable international databases. Full-text articles available for comprehensive analysis.

The exclusion criteria included: Conference abstracts without complete manuscripts. Editorials, book reviews, dissertations, and opinion papers. Duplicate publications. Articles unrelated to environmental accounting or sustainable organizational performance. Studies lacking sufficient methodological information or empirical evidence. Applying these criteria ensured that only high-quality and methodologically rigorous studies contributed to the evidence synthesis.

The study selection process followed the four stages recommended by the PRISMA 2020 framework. Identification Stage. Relevant studies were identified through systematic database searches using predefined keywords. Duplicate records retrieved from multiple databases were removed before further evaluation.

Screening Stage. Titles and abstracts of the remaining publications were independently examined to determine their relevance to the research objectives. Articles unrelated to Environmental Management Accounting, green innovation, banking sustainability, contingency factors, or organizational effectiveness were excluded.

Eligibility Stage. Full-text articles that passed the screening stage were thoroughly evaluated based on the predetermined inclusion and exclusion criteria. Particular attention was given to methodological quality, theoretical contribution, empirical findings, and relevance to the research questions.

Inclusion Stage. Only studies meeting all eligibility requirements were included in the final qualitative synthesis. The final sample represented high-quality empirical and conceptual literature capable of explaining the relationships among Environmental Management Accounting, Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. The entire process was documented using the PRISMA 2020 flow diagram to enhance transparency and reproducibility.

A standardized data extraction form was developed to ensure consistency during evidence collection. For each selected article, the following information was extracted: Author(s) and publication year; Country and research context; Research objectives; Theoretical framework; Research methodology; Sample characteristics; Variables investigated; Analytical methods; Principal findings; and Recommendations for future research. Collecting standardized information facilitated systematic comparison across studies and enabled comprehensive thematic analysis.

The methodological quality of each included study was evaluated through critical appraisal based on several criteria, including the clarity of research objectives, appropriateness of theoretical foundations, research design, sampling procedures, analytical techniques,

validity of findings, and contribution to knowledge. Priority was given to studies published in reputable peer-reviewed journals, particularly those indexed by Scopus and Web of Science, because these publications generally demonstrate higher methodological rigor and academic credibility.

The collected evidence was analyzed using qualitative thematic synthesis. This analytical approach involved repeatedly reading the selected articles, coding recurring concepts, grouping similar findings into broader themes, and synthesizing relationships among variables. The synthesis focused on identifying: determinants influencing Environmental Management Accounting adoption; the contribution of Green Innovation to sustainable organizational performance; contingency factors affecting EMA implementation; the role of Organizational Effectiveness in sustainability performance; and integrated relationships explaining Sustainable Banking Performance. Thematic synthesis also enabled identification of theoretical convergence, contradictory findings, emerging research trends, and unresolved issues within the literature.

The trustworthiness of this systematic review was enhanced through several methodological strategies. First, the adoption of the PRISMA 2020 protocol ensured methodological transparency and reproducibility throughout the review process. Second, predefined inclusion and exclusion criteria minimized selection bias. Third, multiple internationally recognized databases were used to maximize literature coverage. Fourth, only peer-reviewed scholarly publications were included to strengthen scientific credibility. Finally, data extraction and thematic synthesis were conducted systematically using standardized procedures, thereby improving the consistency and dependability of the review findings.

Overall, this qualitative systematic literature review provides a rigorous methodological foundation for synthesizing existing evidence regarding how Environmental Management Accounting, Green Innovation, Contingency Factors, and Organizational Effectiveness interact to enhance Sustainable Banking Performance. The findings are expected to contribute to the advancement of management accounting theory, sustainable finance research, and evidence-based managerial practices within the global banking industry.

4. Results and Discussion

This study systematically synthesized empirical and conceptual evidence concerning the relationships among Environmental Management Accounting (EMA), Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. Following the PRISMA-based review process, the selected literature demonstrates that research on Environmental Management Accounting has expanded considerably during the last decade, particularly after 2020, reflecting the growing importance of sustainability, ESG implementation, climate-risk management, and green finance within organizations. Recent systematic reviews indicate that EMA has evolved from a traditional environmental cost accounting tool into a strategic management information system supporting organizational sustainability, digital transformation, and long-term competitive advantage.

Environmental Management Accounting as a Strategic Driver of Sustainable Banking Performance. The reviewed studies consistently identify Environmental Management Accounting as a strategic mechanism that enables organizations to improve environmental performance while simultaneously strengthening financial and operational performance. Earlier studies primarily emphasized EMA as a tool for measuring environmental costs and resource consumption (Bartolomeo et al., 2000; Burritt et al., 2002). However, recent literature demonstrates that EMA has become increasingly integrated into strategic planning, sustainability governance, risk management, and organizational innovation. Swalih et al. (2024), through a systematic review of 89 international studies, concluded that organizations implement EMA not only for environmental compliance but also to improve organizational efficiency, strategic decision-making, and long-term sustainable development. The review further identified legitimacy, organizational efficiency, and strategic sustainability as the three primary motivations for EMA adoption.

Within the banking sector, EMA supports sustainability by providing environmental information that assists managers in evaluating climate-related risks, measuring environmental impacts of financing activities, and improving resource allocation for green investments. Nguyen Kim Quoc and Duong Thi Thuy (2025) demonstrated that Environmental Management Accounting significantly mediates the effects of environmental strategy, organizational structure, organizational size, industry characteristics, and green innovation on bank performance. Their study involving 315 respondents from Vietnamese commercial

banks confirmed that EMA strengthens organizational capability to transform environmental strategies into improved banking performance.

Similarly, Deb et al. (2023) found that organizations implementing EMA achieved higher environmental and financial performance through more effective environmental cost management, resource efficiency, and managerial decision-making. Sari et al. (2021) further showed that process innovation mediates the relationship between EMA and organizational performance, suggesting that environmental accounting contributes indirectly to organizational effectiveness by facilitating innovation.

Green Innovation Enhances Sustainable Organizational Performance. Another dominant finding emerging from the reviewed literature concerns the strategic role of Green Innovation. Nearly all empirical studies indicate that green innovation positively influences organizational competitiveness, environmental performance, and long-term financial sustainability.

Green innovation includes environmentally friendly products, cleaner technologies, sustainable operational processes, digital banking innovations, and environmentally responsible financial services. Amores-Salvadó et al. (2015) argued that environmental innovation capabilities complement environmental management systems in generating both environmental and business performance benefits. Likewise, Begum et al. (2022) reported that green leadership encourages green product and process innovation through employee creativity and organizational engagement.

Within banking, green innovation extends beyond technological innovation to include sustainable lending, ESG-based investment portfolios, green bonds, digital banking services, and climate-risk assessment systems. Nguyen et al. (2023) reported that Vietnamese commercial banks increasingly integrate green financing into their strategic business models, improving both sustainability performance and competitive positioning.

Importantly, the reviewed studies consistently demonstrate that EMA provides the environmental information necessary for successful green innovation. Ferreira et al. (2010) concluded that organizations implementing EMA possess greater capability to identify environmental improvement opportunities and evaluate innovation investments. Likewise, Agustia et al. (2019) found that EMA significantly mediates the relationship between green innovation and firm value, while Chaudhry et al. (2020) reported that environmental strategy and EMA jointly strengthen the impact of environmental innovation on financial performance.

Recent systematic reviews further confirm that research linking EMA and Green Innovation has expanded rapidly, although the literature remains fragmented regarding the causal mechanisms connecting both constructs. Future studies are therefore encouraged to integrate organizational capability theory, contingency theory, and sustainability accounting frameworks into comprehensive conceptual models.

Contingency Factors Determine EMA Effectiveness. The literature consistently supports Contingency Theory as one of the dominant theoretical perspectives explaining Environmental Management Accounting implementation.

According to Contingency Theory, organizational effectiveness depends on the compatibility between organizational systems and contextual conditions rather than universal management practices. Christ and Burritt (2013) concluded that organizational size, environmental uncertainty, industrial characteristics, environmental strategy, and managerial commitment significantly influence EMA adoption.

Similarly, Abdel-Kader and Luther (2008) found that organizational characteristics strongly determine management accounting practices. Larger organizations generally possess greater technological capability, financial resources, and managerial expertise necessary for implementing sophisticated environmental accounting systems.

More recent empirical studies strengthen these conclusions. Kong et al. (2022) demonstrated that institutional pressure and environmental uncertainty significantly influence EMA implementation, while Doan et al. (2023) found that government regulations, organizational commitment, environmental awareness, and managerial support positively affect EMA adoption within Vietnamese enterprises.

The banking literature similarly emphasizes contingency factors. Nguyen Kim Quoc and Duong Thi Thuy (2025) reported that environmental strategy, organizational structure, organizational size, industry characteristics, and green innovation significantly affect bank performance through EMA mediation, indicating that contextual organizational characteristics remain fundamental determinants of sustainable banking performance.

Organizational Effectiveness as an Outcome of EMA. The reviewed literature indicates that Organizational Effectiveness represents one of the principal outcomes associated with successful EMA implementation.

Organizational effectiveness refers to the organization's ability to achieve strategic objectives while maintaining adaptability, efficiency, innovation capability, and stakeholder satisfaction. Organizational learning plays an essential role in this process because organizations capable of continuously learning and adapting are more successful in implementing sustainability initiatives.

Aponte and Zapata (2013) argued that organizational learning improves organizational adaptability and long-term effectiveness. Likewise, Turi and Sorooshian (2019) found that organizational structure significantly influences organizational learning capability.

Several empirical studies directly link EMA with organizational effectiveness. Le et al. (2019) demonstrated that Environmental Management Accounting improves performance efficiency within Vietnamese manufacturing firms by supporting environmental decision-making and efficient resource allocation. Prasetya and Safitri (2023) also reported that EMA positively influences financial performance through better working capital management.

Furthermore, Sari et al. (2021) concluded that organizations implementing EMA achieve higher organizational performance because environmental accounting facilitates continuous process innovation, operational efficiency, and strategic managerial decisions.

Sustainable Banking Performance. Another important finding concerns the multidimensional nature of Sustainable Banking Performance. The reviewed literature demonstrates that banking performance is no longer evaluated solely through profitability indicators such as Return on Assets (ROA), Return on Equity (ROE), or Net Interest Margin (NIM). Instead, sustainable banking performance increasingly incorporates environmental stewardship, social responsibility, ESG implementation, stakeholder trust, environmental risk management, and long-term organizational resilience.

Weber (2017) argued that banks integrating sustainability into strategic management achieve superior long-term competitiveness and stakeholder confidence. Similarly, Driessen (2021) emphasized that sustainable finance requires integrated environmental information systems capable of supporting green investments and climate-risk management.

Recent studies on green banking also indicate increasing adoption of green loans, sustainable financing, climate-risk disclosure, and environmentally responsible investment portfolios, which contribute positively to banking competitiveness and organizational sustainability.

The systematic review reveals several emerging research trends. First, EMA research has shifted from environmental cost measurement toward strategic sustainability management and digital decision support.

Second, increasing attention is being devoted to integrating EMA with ESG reporting, artificial intelligence, digital transformation, biodiversity accounting, and circular economy practices.

Third, although considerable evidence supports positive relationships among EMA, Green Innovation, Organizational Effectiveness, and Sustainable Performance, relatively few studies specifically investigate these relationships within banking institutions.

Finally, the literature remains fragmented regarding the interaction between Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. Most previous studies investigate these variables separately rather than integrating them into a comprehensive theoretical framework.

Overall, the findings indicate that Environmental Management Accounting functions as a strategic organizational capability that transforms environmental strategies, green innovation, and organizational resources into sustainable organizational outcomes. The review therefore supports the proposition that successful implementation of EMA, reinforced by favorable contingency factors and continuous green innovation, substantially enhances organizational effectiveness and sustainable banking performance. Future empirical studies should test integrated conceptual models using cross-country banking datasets, longitudinal designs, and advanced analytical techniques to strengthen theoretical generalizability and managerial implications.

5. Conclusions

This study conducted a qualitative Systematic Literature Review (SLR) to synthesize and critically evaluate the existing literature on the relationships among Environmental

Management Accounting (EMA), Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. The review demonstrates that Environmental Management Accounting has evolved from a conventional environmental cost management tool into a strategic management accounting system that supports sustainability-oriented decision-making, environmental risk management, organizational innovation, and long-term value creation. The increasing adoption of EMA reflects the growing pressure on banking institutions to integrate environmental, social, and governance (ESG) principles into their operational and strategic activities.

The findings consistently indicate that Environmental Management Accounting serves as a fundamental strategic capability that enables banking institutions to improve resource efficiency, strengthen environmental accountability, support green financing initiatives, and enhance sustainable organizational performance. EMA provides comprehensive environmental and financial information that facilitates managerial decision-making, allowing banks to evaluate environmental risks, allocate resources more effectively, and monitor sustainability performance. Consequently, organizations implementing EMA are generally better positioned to achieve both financial objectives and environmental sustainability.

The review further reveals that Green Innovation is a critical mechanism linking EMA with Sustainable Banking Performance. Environmental Management Accounting supplies reliable environmental information that supports the development of innovative green products, sustainable financial services, environmentally responsible investment strategies, digital banking solutions, and climate-risk management practices. Banks that integrate green innovation into their strategic operations demonstrate stronger competitive advantages, improved operational efficiency, enhanced stakeholder confidence, and greater long-term organizational resilience. Therefore, green innovation should not be viewed merely as a technological initiative but as a strategic organizational capability supported by effective environmental accounting systems.

Another important conclusion concerns the significant influence of Contingency Factors on EMA implementation. The review confirms the applicability of Contingency Theory, suggesting that the effectiveness of Environmental Management Accounting depends upon organizational context rather than universal management practices. Organizational size, organizational structure, environmental strategy, managerial commitment, institutional pressure, environmental uncertainty, government regulation, and industry characteristics consistently emerge as important determinants influencing EMA adoption and effectiveness. These findings indicate that successful implementation of environmental accounting systems requires alignment between organizational capabilities and external environmental conditions.

The literature also demonstrates that Organizational Effectiveness functions as an important organizational outcome of EMA implementation. Banks implementing Environmental Management Accounting generally experience improvements in organizational learning, strategic planning, operational efficiency, innovation capability, environmental governance, and managerial decision-making. These organizational capabilities subsequently contribute to sustainable banking performance by enhancing both financial performance and environmental responsibility. Accordingly, organizational effectiveness serves as an important intermediary through which environmental accounting contributes to sustainable organizational competitiveness.

The review additionally highlights that the concept of Sustainable Banking Performance has become increasingly multidimensional. Rather than relying exclusively on traditional financial indicators such as profitability, sustainable banking performance now encompasses environmental stewardship, ESG implementation, stakeholder satisfaction, green financing, climate-risk management, regulatory compliance, and long term organizational resilience. This transformation reflects the broader evolution of the banking industry toward sustainable finance and responsible investment practices.

Although empirical evidence consistently supports positive relationships among Environmental Management Accounting, Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance, the review identifies that the existing literature remains fragmented. Many previous studies investigate these variables independently, while relatively few studies integrate them into a comprehensive conceptual framework specifically within the banking sector. Consequently, this systematic literature review contributes by synthesizing these diverse research streams into an integrated understanding of how environmental accounting supports sustainable banking performance through innovation, organizational capabilities, and contextual organizational factors.

Overall, this review concludes that Environmental Management Accounting represents a strategic managerial capability that enhances Sustainable Banking Performance through the complementary roles of Green Innovation, favorable Contingency Factors, and improved Organizational Effectiveness. The findings provide important theoretical contributions to the literature on management accounting, sustainable finance, and banking management while offering practical implications for banking executives, regulators, and policymakers seeking to strengthen sustainability-oriented banking strategies in an increasingly complex environmental and regulatory landscape.

6. Limitations

Despite providing a comprehensive synthesis of the existing literature, this study has several limitations that should be acknowledged. First, this research employed a qualitative Systematic Literature Review approach and therefore relied exclusively on previously published studies. Consequently, the findings depend upon the quality, methodological rigor, and contextual characteristics of the selected literature. No primary empirical data were collected to validate the proposed relationships among Environmental Management Accounting, Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance.

Second, although the review incorporated studies from reputable international databases and peer-reviewed journals, the majority of empirical evidence originated from manufacturing industries and emerging economies, while relatively limited research specifically examined the banking sector. This imbalance restricts the generalizability of the conclusions across different financial systems, institutional environments, and banking models.

Third, the reviewed studies employed diverse theoretical perspectives, research designs, measurement indicators, and analytical techniques. Such methodological heterogeneity makes direct comparison among studies challenging and may contribute to inconsistencies in reported findings. Differences in institutional contexts, environmental regulations, and national sustainability policies further complicate cross-country comparisons.

Fourth, this review primarily focused on the relationships among Environmental Management Accounting, Green Innovation, Contingency Factors, Organizational Effectiveness, and Sustainable Banking Performance. Other potentially influential variables including Environmental, Social, and Governance (ESG) maturity, digital transformation capability, artificial intelligence adoption, corporate governance quality, stakeholder engagement, climate-risk disclosure, and organizational culture were beyond the scope of this review. These variables may provide additional explanatory power in future research.

Finally, because sustainability management, green finance, climate risk regulation, and Environmental Management Accounting continue to evolve rapidly, new empirical evidence may emerge after the completion of this review. Future research should therefore conduct updated systematic reviews and empirical investigations using longitudinal datasets, cross-country comparisons, and advanced analytical approaches such as Structural Equation Modeling (SEM), multilevel analysis, or mixed-methods research. Future studies are also encouraged to develop integrated theoretical models that combine Contingency Theory, Resource Based View, Dynamic Capabilities Theory, Institutional Theory, and Stakeholder Theory to provide a more comprehensive explanation of how Environmental Management Accounting contributes to Sustainable Banking Performance in the era of sustainable finance and digital transformation.

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