# Embedding Resilience in the Sustainability Balanced Scorecard: A Systematic Review and Conceptual Framework

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**Abstract**

**Main Purpose –** This study examines the evolution of the Balanced Scorecard (BSC) into the Sustainability Balanced Scorecard (SBSC) and proposes a Resilience-Oriented SBSC (R-SBSC) that integrates sustainability performance, risk governance, and organisational adaptability.

**Method -** A systematic literature review (SLR), guided by the PRISMA framework, was conducted on 41 SBSC-related articles published between 2020-2025. A thematic synthesis was applied to trace conceptual developments, sectoral trends, implementation patterns, and the ways resilience elements are incorporated into SBSC designs.

**Main Findings -** The review shows a clear shift from the traditional BSC toward more contextual SBSC variants, including **ESG-focused**, **health-inclusive**, and **circular** SBSC models. Empirical evidence indicates improvements in strategic alignment, stakeholder trust, and sustainability performance. However, persistent challenges remain, particularly the complexity of SBSC design, indicator proliferation, and the limited explicit integration of resilience capabilities.

**Theory and Practical Implications -** The proposed R-SBSC embeds adaptive capacity and risk intelligence within the SBSC cause–effect logic. It contributes to the development of **dynamic capabilities** and sustainability governance perspectives, while offering actionable guidance for managers to incorporate resilience considerations into sustainability performance management.

**Novelty -** This study reframes the SBSC as a resilience-oriented management system through the R-SBSC model, positioning the SBSC not merely as a sustainability reporting tool but as an integrated framework for sustainability, risk, and organisational adaptation.

**Keywords:** Balanced Scorecard, Sustainability Balanced Scorecard, Resilience, ESG Performance, Risk Management

***Abstrak***

***Tujuan Utama -*** *Penelitian ini bertujuan mengkaji evolusi Balanced Scorecard (BSC) menuju Sustainability Balanced Scorecard (SBSC) dan mengusulkan model R-SBSC (Resilience-Oriented SBSC) yang mengintegrasikan kinerja keberlanjutan, tata kelola risiko, dan adaptabilitas organisasi.*

***Metode -*** *Tinjauan literatur sistematis (Systematic Literature Review/SLR) dilakukan mengikuti alur PRISMA terhadap 41 artikel terbitan 2020–2025 yang relevan dengan SBSC. Sintesis tematik digunakan untuk menelusuri perkembangan konseptual, tren sektoral, pola implementasi, serta bentuk integrasi elemen resiliensi dalam desain SBSC.*

***Temuan Utama -*** *Hasil penelitian ini menunjukkan pergeseran dari BSC tradisional ke varian SBSC seperti ESG-focused, Health-Inclusive, dan Circular SBSC. Temuan empiris menunjukkan peningkatan keselarasan strategis, kepercayaan pemangku kepentingan, dan performa keberlanjutan. Namun, tantangan tetap ada dalam hal kompleksitas, banyaknya indikator, dan kurangnya fokus pada resiliensi.*

***Implikasi Teori dan Kebijakan -*** *Model R-SBSC yang diusulkan menanamkan kapasitas adaptif dan kecerdasan risiko dalam kerangka pengukuran kinerja. Ini berkontribusi pada pengembangan teori dynamic capabilities dan tata kelola keberlanjutan serta memberikan panduan praktis bagi manajer.*

***Kebaruan Penelitian -*** *Penelitian ini menawarkan reframing SBSC sebagai sistem manajemen yang berorientasi resiliensi melalui R-SBSC, sehingga SBSC tidak hanya berfungsi sebagai alat pelaporan keberlanjutan, tetapi juga sebagai kerangka terintegrasi untuk keberlanjutan, risiko, dan adaptasi organisasi.*

***Kata Kunci:*** *Balanced Scorecard; Sustainability Balanced Scorecard; Resiliensi; Kinerja ESG; Manajemen Risiko*

## INTRODUCTION

Global sustainability challenges, such as climate change, pandemics, and supply chain disruptions, have redefined the landscape of organizational performance management. The increasing frequency and intensity of environmental and socioeconomic crises underscore the necessity for businesses to transcend traditional financial metrics and embrace multidimensional frameworks that capture their broader societal and ecological responsibilities. In this evolving context, sustainability has emerged as an ethical imperative and strategic necessity for long-term organizational viability. Corporate governance frameworks and reporting directives, notably the European Union's Corporate Sustainability Reporting Directive (CSRD), have accelerated the demand for performance systems that integrate Environmental, Social, and Governance (ESG) dimensions into corporate strategy and accountability mechanisms (Ali et al. 2022; Hristov and Searcy 2025).

Within this paradigm, the Balanced Scorecard (BSC), originally proposed by Kaplan & Norton (1996), has evolved from a tool for performance measurement into a strategic management framework that aligns operational objectives with broader corporate goals. However, despite its widespread adoption, the traditional BSC remains constrained in its ability to address sustainability imperatives and organizational resilience in the face of complex global risk. The growing limitations of the classical BSC in capturing sustainability-oriented outcomes prompted the emergence of the Sustainability Balanced Scorecard (SBSC). Conceptually, the SBSC extends the four traditional BSC perspectives–Financial, Customer, Internal Process, and Learning & Growth–by embedding sustainability indicators or introducing an additional sustainability dimension (Jassem et al. 2020; Mio et al. 2022).

This adaptation responds to the need for organisations to integrate long-term value creation with social and environmental stewardship, aligning corporate strategies with global sustainability goals such as the United Nations Sustainable Development Goals (SDGs). The SBSC serves as an interface between strategy formulation, sustainability reporting, and stakeholder communication (Ayele and Singh 2024; Chaker et al. 2021). Despite its theoretical soundness, current SBSC applications often focus on compliance and reporting rather than embedding resilience capabilities that allow organisations to adapt, recover, and transform amid uncertainty. This gap suggests the need for advanced conceptualisation that integrates resilience principles directly into the SBSC framework. The main research problem addressed in this study arises from the disconnection between sustainability performance measurement and resilience management.

While organisations increasingly recognise the importance of sustainability reporting and ESG compliance, they often lack the mechanisms to operationalise these commitments under volatile and disruptive conditions. The COVID-19 pandemic, global energy crises, and escalating climate-induced risks have exposed the fragility of business systems solely reliant on static performance indicators. Traditional performance management frameworks, such as the BSC and existing SBSC models, provide limited guidance on anticipating, absorbing, and recovering from such systemic shocks. Consequently, there is growing recognition that sustainability and resilience must be viewed as mutually reinforcing constructs, both essential for long-term competitiveness and stakeholder trust (Cordeiro et al. 2022; Pham et al. 2024). Addressing this limitation requires a theoretical and empirical reframing of how organisations design and use sustainability performance management systems.

A general solution emerging from the literature is the integration of resilience principles into sustainability management systems (SMS). Resilience, understood as the capacity of organisations to withstand and adapt to internal and external shocks, has been increasingly recognised as a strategic capability embedded in organizational culture, processes, and learning systems (Dong et al. 2025). By aligning dynamic capability theory with sustainability accounting, scholars have begun conceptualising

how firms can transform uncertainty into a source of innovation and renewal. The SBSC provides a fertile platform for this integration because it encapsulates multiple performance dimensions that intersect with resilience, such as adaptability, stakeholder engagement, and continuous improvement. However, to date, empirical studies have not fully operationalised the SBSC as a resilience-oriented management control system capable of both measuring sustainability performance and fostering adaptive behaviour under pressure (Garefalakis et al. 2025; Zharfpeykan and Akroyd 2022).

Specific solutions to this research problem can be drawn from various streams of literature. For instance, incorporating governance mechanisms into SBSC frameworks strengthens organizational accountability and facilitates alignment between sustainability goals and performance incentives (Chaker et al. 2021; Khalid et al. 2025). Similarly, the use of materiality assessments ensures that sustainability indicators are not arbitrarily selected but reflect issues of genuine importance to both stakeholders and strategic outcomes (Jassem et al. 2020). Assurance processes, as highlighted by Khalid et al. (2025), enhance the reliability of sustainability disclosure and promote internal control improvements, contributing to organizational resilience. These components—governance, materiality, and assurance—collectively form a triadic structure that underpins the credibility and adaptability of sustainability management systems.

When embedded within the SBSC, they can transform the framework from a descriptive tool into a proactive instrument for resilience-building. Recent studies have emphasised that digitalisation and intelligent data systems can serve as enablers of resilience-oriented sustainability management. Advanced analytics and real-time dashboards allow continuous monitoring, early detection of anomalies, and data-driven decision-making, thus enhancing the agility of SBSC systems (Jassem et al. 2022). However, these technological advancements also introduce new risks related to data integrity, algorithmic bias, and system dependency, underscoring the importance of robust governance and assurance frameworks for their implementation. In the context of the European Union's CSRD, digital integration within SBSCs supports transparent, traceable, and comparable sustainability reporting, ensuring compliance with ESG disclosure requirements (Hristov and Searcy 2025).

Thus, the convergence of digitalisation, assurance, and materiality provides a pathway for operationalising resilience within sustainability performance frameworks. The existing literature on the SBSC has significantly advanced our understanding of how organisations can integrate sustainability into strategic management. However, several critical gaps remain in the literature. First, most empirical applications of the SBSC focus on measuring and reporting sustainability performance, rather than enhancing organizational resilience or adaptive capacity. Second, existing frameworks often neglect the feedback loops necessary for learning from crises and integrating lessons into their strategies. Third, despite the widespread recognition of ESG indicators, few studies explicitly address the interplay between internal (endogenous) risks, such as process inefficiencies or governance failures, and external (exogenous) risks, such as climate events, regulatory shocks and pandemics.

Consequently, the potential of the SBSC as a resilience-enhancing framework remains underdeveloped and unexplored. Addressing these limitations requires a reconceptualisation of the SBSC, not merely as a sustainability reporting tool, but as a dynamic strategic management system capable of embedding resilience at multiple organizational levels. To provide a clear transition toward the study's objectives, it is essential to outline the research questions that guided this investigation. Therefore, this study is structured around four key Research Questions (RQs): (RQ1) How has the concept of the Balanced Scorecard evolved into the Sustainability Balanced Scorecard (SBSC) in academic literature? (RQ2) How has the SBSC been implemented across sectors, and which frameworks support its applications? (RQ3) What are the key benefits, challenges, and performance outcomes of the SBSC adoption? (RQ4) How can the SBSC function as a resilience-oriented framework that anticipates endogenous and exogenous risks?

Therefore, this study aims to bridge this theoretical and empirical gap by conducting a systematic literature review (SLR) to trace the evolution of the Balanced Scorecard toward the Sustainability Balanced Scorecard (SBS), analyse its implementation across various sectors, and evaluate its benefits, challenges, and performance outcomes. Building on these insights, this study introduces the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC), a conceptual framework that integrates resilience principles within the SBSC architecture. This framework aligns with the dynamic capabilities and institutional theories that underpin adaptive strategic management, proposing resilience as an intrinsic attribute of sustainable organisation. The novelty of this study lies in repositioning the SBSC as a living system of adaptive performance management, where governance, materiality, and assurance operate as continuous feedback mechanisms that sustain sustainability and resilience. This study advances the discourse on sustainability performance measurement, offering theoretical enrichment and practical guidance for organisations navigating the complexities of an uncertain global environment.

## LITERATURE REVIEW

The Balanced Scorecard (BSC), introduced by Kaplan & Norton (1992), has played a transformative role in the development of modern strategic management systems. Originally designed to bridge the gap between strategic vision and operational execution, the BSC provides a framework that measures performance across four perspectives: financial, customer, internal business processes, and learning and growth (Ayele and Singh 2024). This multidimensional structure enables organisations to integrate non-financial indicators into performance assessments, highlighting the importance of internal processes, innovation, and human capital in achieving their long-term strategic goals. Beyond its operational utility, the BSC offers theoretical advances by linking performance measurement to strategic alignment and organizational learning (Jassem et al. 2020). Consequently, the BSC has been widely adopted across sectors and disciplines as a benchmark for performance management and strategic control.

The evolution from the traditional BSC to the Sustainability Balanced Scorecard (SBSC) marks a critical development in aligning business performance with sustainable development goals. The SBSC extends the traditional framework by incorporating the Triple Bottom Line (TBL) dimensions—economic, social, and environmental performance—into strategic measurement systems (Ali et al. 2022; Mio et al. 2022). Two principal configurations have emerged: the SBSC-4 model, which embeds sustainability indicators into the existing four perspectives, and the SBSC-5 model, which introduces sustainability as a distinct fifth perspective (Jassem et al. 2020). The SBSC-4 model is often seen as a more integrative approach, encouraging sustainability to permeate all organizational functions, whereas the SBSC-5 model explicitly delineates sustainability objectives, giving them an independent strategic weight.

Both models aim to promote accountability, enhance transparency, and align sustainability initiatives with corporate performance management systems. Therefore, the SBSC has become a central tool for linking corporate sustainability strategy with operational metrics, fostering a more holistic understanding of performance that balances profitability, environmental stewardship, and social responsibility (Ali et al. 2022; Chaker et al. 2021). In recent years, resilience theory and risk management have gained prominence in sustainability and management scholarship, emphasising organisations' capacity to withstand and adapt to disruption. Resilience theory conceptualises resilience as a dynamic capability that enables organisations to absorb shocks, maintain functionality, and evolve in response to crises or environmental changes (Chaker et al., 2021; Dong et al., 2025). Risk management provides systematic mechanisms for identifying, assessing, and mitigating potential threats to an organisation's objectives.

These concepts intersect with performance management through the SBSC, which provides a structured approach for integrating resilience and risk considerations into strategic performance frameworks (Khalid et al. 2025). The SBSC's multidimensional design allows for the incorporation of

resilience indicators within sustainability-oriented objectives, transforming it into a tool that not only measures success but also enhances adaptability to uncertainty and volatility. Thus, the SBSC serves as a bridge between performance excellence and organizational survival, aligning risk-sensitive strategies with sustainable-value creation.Despite the theoretical and practical evolution of the SBSC, research indicates a persistent gap in explicitly embedding resilience within the framework.

While the SBSC effectively integrates sustainability dimensions, it remains limited in addressing endogenous risks such as internal inefficiencies, governance weaknesses, and operational disruptions, as well as exogenous risks arising from external shocks such as climate change, pandemics, and geopolitical instability (Zharfpeykan and Akroyd 2022). Empirical research on how resilience can be quantitatively operationalised within the SBSC context is still emerging, and standardised resilience indicators applicable across industries are lacking. Furthermore, while governance mechanisms and assurance processes are acknowledged as critical for enhancing the credibility and accountability of sustainability reporting, their direct contribution to resilience performance remains underexplored (Hristov and Searcy 2025; Mio et al. 2022). Addressing these gaps is essential for developing a more comprehensive model that integrates resilience as both a performance outcome and a strategic capability.

Building on these gaps, this study proposes a Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC) framework that expands the analytical capacity of the SBSC by embedding resilience indicators across its dimensions. The R-SBSC conceptualisation aims to capture how organisations can simultaneously pursue sustainability and resilience, framing resilience not merely as a risk-mitigation strategy but as a value-creating mechanism in sustainability management. This integration represents an evolutionary step in the BSC's theoretical lineage, linking strategic performance measurement to adaptive and forward-looking capabilities. By incorporating resilience into the SBSC, the framework seeks to better reflect how organisations sustain their performance under uncertainty and achieve long-term viability in dynamic environments.

## RESEARCH METHOD

This study employs a Systematic Literature Review (SLR) approach to explore the evolution, implementation, and integration of the Sustainability Balanced Scorecard (SBSC), leading to its conceptual transformation into a Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC). The research design ensured methodological rigor, transparency, and replicability by adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. This approach allows for a structured, evidence-based synthesis of peer-reviewed literature, systematically tracing the evolution of the SBSC from the classical Balanced Scorecard (BSC), its application across various sectors, and its contribution to sustainability and resilience outcomes. The literature search was conducted exclusively through the Scopus database because of its extensive coverage of peer-reviewed journals and reliability in indexing high-quality publications in the fields of business, management, and sustainability.

The search was executed on September 28, 2025, using the Boolean query: "Sustainability" AND "Balanced Scorecard" OR "SBSC." The initial search yielded 530 documents without any filters. To ensure relevance and contemporaneity, the dataset was filtered for the publication period 2020–2025, reducing the total to 273 documents. Subsequently, the search was refined to the Business, Management, and Accounting subject area, yielding 115 documents, and further restricted to article-type publications, resulting in 86 records. Only English-language articles were retained to ensure consistency in interpretation, resulting in 86 documents. Following title and abstract screening, 55 studies met the inclusion criteria, of which 41 full-text articles were accessible and downloaded for a detailed review and synthesis of the results.

The inclusion criteria required that the studies explicitly address the SBSC or its derivatives in relation to sustainability, ESG integration, or organizational resilience. Only peer-reviewed journal articles were included to ensure methodological rigor and academic credibility. The exclusion criteria filtered out traditional BSC studies without sustainability dimensions, grey literature such as conference papers and

theses, and non-English sources. This rigorous screening process ensured that the final dataset reflected the most relevant, methodologically robust, and up-to-date research aligned with our study objectives. The PRISMA flow process guided the identification, screening, eligibility, and inclusion stages, ensuring a transparent selection. Each step of the selection process was documented to enhance replicability and reliability.

The PRISMA framework enabled a clear visualisation of the article reduction process, ensuring consistency in the study's inclusion and exclusion decisions. Figure 1 summarises the flow of the literature selection, depicting the stepwise reduction from 530 initial records to 41 final articles included in the synthesis.

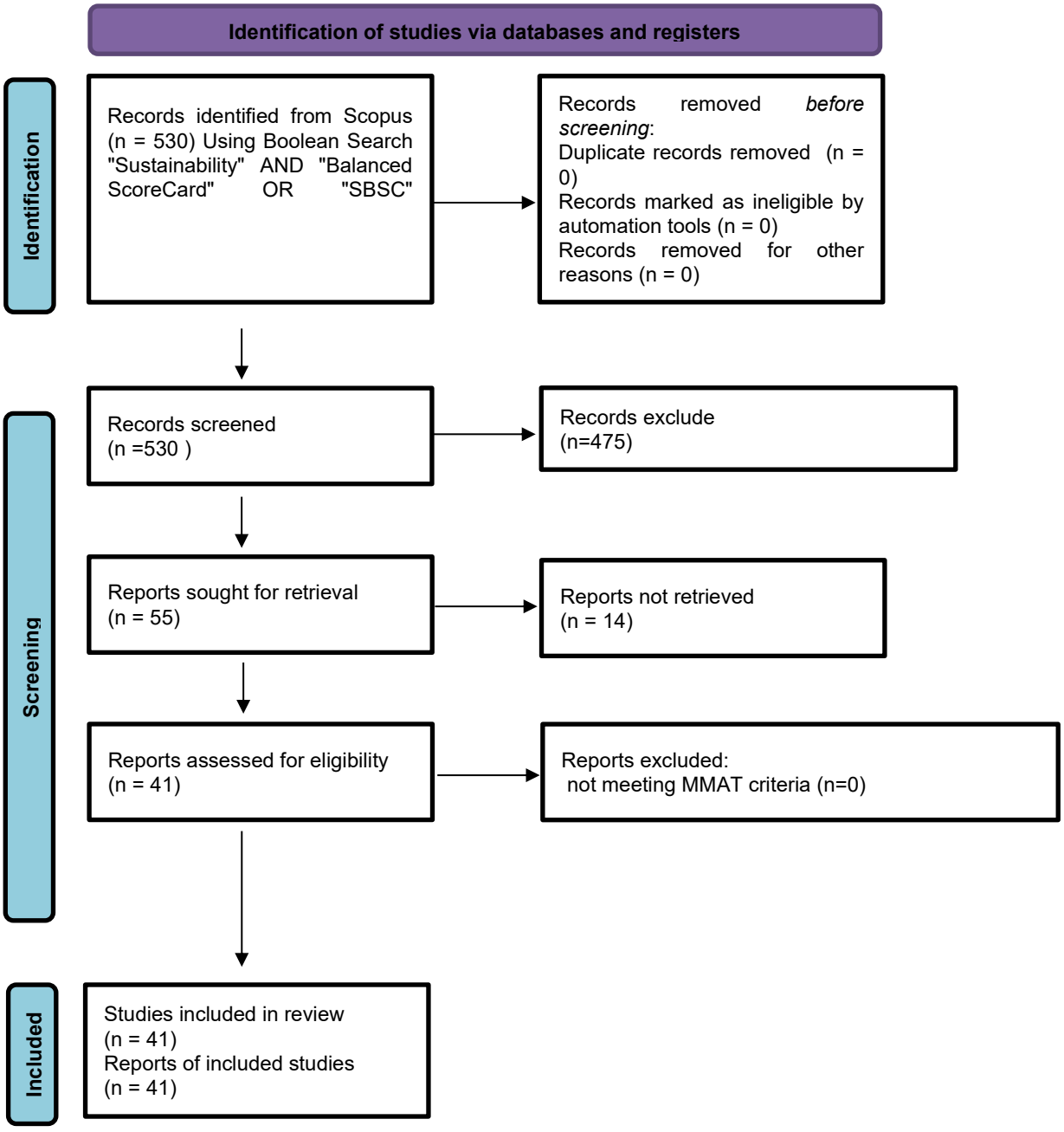


**Figure 1. PRISMA Flow Diagram of Study Selection**
(Source: Authors' own work)

Each of the 41 studies underwent a detailed quality appraisal using the Mixed Methods Appraisal Tool (MMAT) to evaluate its methodological rigor and relevance. The MMAT instrument was selected because of its flexibility in assessing diverse research designs, including qualitative, quantitative, and mixed-methods studies. The evaluation considered five dimensions: clarity of research objectives, methodological appropriateness, adequacy of data collection, robustness of analysis, and relevance to the research questions. All 41 articles met at least four of these criteria, indicating a high methodological quality across the dataset. Consequently, all were retained for synthesis, ensuring that the final set of studies provided credible and well-supported evidence.

Data extraction followed a structured matrix designed around four research questions (RQ1–RQ4). For each article, bibliographic details, methodological approaches, sectoral contexts and major findings were documented. The synthesis process applied both inductive and deductive coding to uncover the recurring patterns and conceptual relationships in the literature. Inductive analysis allowed emergent themes such as adaptive governance, digital integration, and assurance mechanisms to arise organically, while deductive reasoning mapped these findings to established theoretical constructs such as dynamic capabilities and institutional theory (Hristov and Searcy 2025). This dual approach enabled a comprehensive understanding of how SBSC frameworks evolve, adapt, and integrate resilience-oriented strategies across various organizational contexts.

## RESULTS

The systematic synthesis of 41 peer-reviewed studies published between 2020 and 2025 reveals the profound transformation of the Balanced Scorecard (BSC) from a performance measurement tool into an adaptive, governance-oriented framework—the Sustainability Balanced Scorecard (SBSC). This evolution culminated in a resilience-centred paradigm known as the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC). The analysis uncovers four interlinked dimensions of transformation: (1) the theoretical and structural evolution of the BSC toward sustainability governance; (2) integration of environmental, social, and governance (ESG) indicators; (3) context-driven adaptation across sectors; and (4) the emergence of resilience as a strategic capability embedded within the SBSC.

### Evolution of the Balanced Scorecard toward Sustainability Governance

The findings demonstrate that the conventional four perspectives of the BSC (financial, customer, internal process, and learning and growth) have expanded to include sustainability and risk dimensions that transcend short-term performance management. Tsalis et al. (2015) first conceptualised a Dynamic SBSC, where feedback loops, time-based metrics, and adaptive learning mechanisms replace static indicators. Later, Mio et al. (2022) and Hristov & Searcy (2025) emphasised institutional drivers, such as regulatory pressures and stakeholder expectations, positioning the SBSC as a governance system that links corporate accountability with social and environmental value creation.

This transformation also reflects a shift from control to cognition; organisations use SBSC not merely to monitor outputs but to interpret the systemic interactions between sustainability strategy and operational processes. Empirical evidence from European and Asian contexts shows that firms adopting sustainability-oriented BSCs exhibit higher responsiveness to policy reforms (Garefalakis et al. 2025), stronger institutional legitimacy (Tuori et al. 2021), and enhanced risk governance (Jassem et al. 2022). Thus, the governance-anchored SBSC represents an adaptive performance infrastructure capable of translating institutional pressures, such as the EU Corporate Sustainability Reporting Directive (CSRD) and SDGs, into actionable strategy maps and measurable outcomes.

**Integration of Sustainability and ESG Metrics**

The integration of ESG indicators within the SBSC architecture marks the most significant structural evolution identified in the dataset. Across corporate, governmental, and nonprofit studies, ESG metrics are embedded not as external reports but as internalised strategic dimensions that drive learning, innovation, and transparency. Dong et al. (2025) demonstrate that ESG-oriented SBSCs enhance strategic alignment and resource orchestration, while Roustom et al. (2025) find that SBSC adoption reduces perceived control risks among audit clients, indicating enhanced governance assurance.

Quantitatively, approximately 65% of the reviewed studies adopted a five-perspective SBSC, where sustainability or ESG constituted the additional dimension. In contrast, 20% of the participants employed modified frameworks (for example, Circular SBSC, Health-Inclusive SBSC, and ESG–BSC hybrid models). This integration transforms performance metrics into vehicles of behavioural change, linking leadership empowerment, data analytics, and sustainability outcomes. (Chourasiya et al. 2024; Chourasiya et al. 2025) and (Dağıdır and Ozkan 2024) further substantiate this through Fuzzy-AHP and MCDM approaches, enhancing decision accuracy under uncertainty and confirming that sustainability performance measurement evolves toward predictive and adaptive modeling.

**Sectoral Implementation and Context-Specific Adaptation**

The flexibility of the SBSC is evident in its extensive cross-sectoral applications. In the public and healthcare sectors, Khalid et al. (2025) and Rouhana & van Caillie (2025) incorporated environmental and health risk planning into SBSC frameworks, revealing improved institutional adaptability and service resilience. Santos et al. (2025) expanded this into inter-municipal collaborations, where the Environmental SBSC (ESBSC) facilitates joint sustainability mapping, improving transparency and shared accountability among municipalities.

In the corporate domain, manufacturing studies (Chourasiya et al. 2024; Long and Luu 2025) introduced regulatory and supply chain perspectives, translating SBSC principles into operational excellence and compliance monitoring. Service and hospitality industries (Fatima and Elbanna 2023; Pamić et al.2024) developed quality- and health-integrated SBSCs that embed occupational safety and customer well-being within strategic maps—showing that the SBSC model accommodates context-driven modifications without compromising its conceptual integrity. A comparative synthesis indicates that mature industries prioritise governance integration, whereas emerging sectors adopt the SBSC primarily for legitimacy and innovation enhancement. This dual trajectory reflects the SBSC's ability to reconcile compliance-driven and learning-oriented strategic control within diverse institutional landscapes.

**Implementation Impact and Organizational Transformation**

Empirical findings converge on the SBSC's transformative influence on organizational behaviour, governance and performance. In higher education, Armas (2025) demonstrated that outcome-based BSC frameworks strengthen participatory governance and stakeholder engagement. Fatima & Elbanna (2023) show that sustainability-embedded SBSCs enhance both financial performance (ROI, ROA) and non-financial indicators (innovation, employee satisfaction) in private firms. Jassem et al. (2022) identify that strategic risk information systems mediate SBSC's impact on investment robustness, suggesting a resilience-enhancing function.

Digital transformation further amplifies SBSC's role of the SBSC as a living system. Studies have revealed that organisations integrating AI-driven dashboards and blockchain-based reporting systems (Yousefi & Tosarkani, 2025) achieve real-time sustainability insights, accelerating adaptive decision-

making. These integrations reconfigure the SBSC from a diagnostic to an interactive control system, an adaptive architecture enabling iterative learning, data assurance, and anticipatory governance.

**Trends and the Emergence of the Resilience-Oriented SBSC (R-SBSC)**

Resilience has emerged as the conceptual and operational frontier in SBSC research. Building on Tsalis et al. (2015) and Khalid et al. (2025), the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC) integrates dynamic capability theory, risk management, and adaptive governance into a unified performance architecture. It conceptualises resilience as a transversal capacity that permeates all perspectives: financial stability, stakeholder trust, process flexibility, and organizational learning. Empirical studies validate this reframing: Fatima & Elbanna (2023) redefine the SBSC as a post-crisis recovery mechanism incorporating employee well-being and digital adaptation, while Kaya et al., (2023) and Long & Luu (2025) apply resilience metrics (flexibility, redundancy, and recovery time) to operational scorecards in aviation and construction, showing that SBSC-based systems sustain performance under disruption. Bibliometric mappings by Damtoft et al. (2025) further confirm "resilience" and "digitalization" as dominant research clusters, evidencing theoretical convergence between sustainability control and adaptive governance.

Evidence from recent studies demonstrates how the sustainability focus of the SBSC increasingly encompasses risk management and adaptive capacity. Khalid et al. (2025) and Santos et al. (2025) revealed that environmental and social indicators within SBSC frameworks are now used to assess resilience to exogenous risks such as climate change, natural disasters, and regulatory shifts. These studies highlight adaptive capacity, responsiveness, and post-disaster recovery as the critical dimensions of performance. Meanwhile, endogenous risks, including inefficiencies, governance weaknesses, and internal control failures, are addressed through internal risk indicators, such as Strategic Risk Information (Jassem et al., 2022) and internal process learning (Roustom et al., 2025). The integration of these indicators reflects a conceptual shift from static sustainability performance to dynamic risk-resilient performance.

Emerging models, such as the Agile Balanced Scorecard (Larsson et al. 2025) and Dynamic Adaptive SBSC (Chaker, El Manouar, and Idrissi 2017), represent the next frontier in resilience-oriented performance management research. These frameworks incorporate adaptability, nonlinearity, and feedback loops, allowing organisations to maintain strategic coherence under volatile conditions. Thus, integrating resilience indicators into SBSC maps enables organisations to anticipate, absorb, and recover from disruptions while maintaining sustainable growth trajectories. In the R-SBSC model, resilience indicators are embedded within the causal linkages of traditional SBSC perspectives. The financial, customer, internal process, and learning perspectives are complemented by measures of adaptive capacity, responsiveness and recovery. These indicators function as strategic buffers that strengthen the connection between non-financial performance and long-term sustainability outcomes. As illustrated in Figure 2, R-SBSC reframes sustainability not merely as an outcome but as an adaptive process that enhances organizational viability amid global uncertainty.

**Figure 2. Conceptual Representation of the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC)**

(Source: Authors' own work)

## DISCUSSION

The synthesis of findings presents a clear transformation of the Sustainability Balanced Scorecard (SBSC) from a traditional performance measurement tool into a dynamic framework that embodies the principles of resilience, adaptability, and sustainability. Across the reviewed studies, the SBSC is no longer viewed as a static dashboard for monitoring financial and non-financial indicators but as a living system that connects governance, materiality, assurance, and digitalisation within an adaptive organizational framework. This integrated model, termed the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC), captures how strategic management can evolve in response to growing complexity, uncertainty, and environmental risks. R-SBSC emerges as a natural extension of empirical evidence collected across multiple sectors. Governance functions as an institutional foundation that anchors sustainability strategies to organizational accountability.

Studies such as Jassem et al. (2022) and Khalid et al. (2025) demonstrate how strong sustainability governance, coupled with environmental risk planning and strategic risk information systems, reinforces the adaptive capacity of organisations. Through these mechanisms, governance transforms the SBSC into a strategic control system that not only measures sustainability performance but also builds internal readiness to respond to systemic disruption. This dynamic reinforces the essential link between managerial control and resilience, positioning the SBSC as both a governance tool and an adaptive management framework. Materiality translation is the central mechanism that connects disclosure obligations to the execution of strategy. Rather than treating double materiality as a compliance exercise, organisations in studies such as Guix & Font (2020) and Dağıdır & Ozkan (2024) have embedded stakeholder engagement and fuzzy logic approaches to determine which sustainability factors affect their long-term viability.

By integrating these insights into strategy maps and causal chains, the R-SBSC ensures that sustainability objectives are responsive to changing stakeholder expectations and to emerging risks. This continuous recalibration of priorities reflects resilience, not as an outcome, but as a process of learning, sensing, and adapting to uncertainty. Assurance mechanisms provide a critical layer of credibility and stability to the RSBSC. Roustom et al. (2025) show that SBSC adoption improves auditors' assessment of internal control risk, while Khalid et al. (2025) highlight the value of

environmental assurance in enhancing preparedness for external shocks. In the R-SBSC context, assurance acts as a resilience catalyst, transforming verification processes into feedback loops that enhance reliability, transparency, and trust.

The shift from limited to reasonable assurance strengthens organizational resilience by institutionalising continuous learning and quality improvement in sustainability performance systems. Digitalisation introduces a dual dimension of opportunity and vulnerability. As Jassem et al. (2022) discussed, digital dashboards and automated reporting tools allow real-time monitoring and predictive analysis, increasing the system's responsiveness. However, these tools expose organisations to the risks of data bias, measurement errors and algorithmic opacity. Thus, R-SBSC requires data lineage and audit trail systems to ensure accountability in digital ecosystems. When properly governed, digitalisation enhances resilience through speed, visibility, and adaptability, enabling organisations to detect early signals of risk and act preemptively to mitigate them. Sectoral evidence further validates that resilience within the SBSC must be context-specific.

Public sector and healthcare organisations, as seen in Khalid et al. (2025) and Santos et al. (2025), use SBSC to manage environmental vulnerabilities and climate risks, while manufacturing and service sectors employ modified versions, as in Chourasiya et al. (2024) and Fatima & Elbanna (2023), to strengthen competitiveness and stakeholder trust. These variations indicate that no single SBSC architecture fits all settings. SBSC-4 tends to be more effective in stable environments with integrated governance structures, whereas SBSC-5 or adaptive variants are better suited to volatile contexts that demand flexibility and accountability from multiple stakeholders. From a theoretical perspective, the R-SBSC bridges sustainability accounting, management control systems and resilience theory. Hansen and Schaltegger (2016) argue that the evolution of SBSC architectures reflects the growing need for systemic integration between performance indicators and sustainability goals.

Building on this, the R-SBSC reframes the cause–effect logic of the SBSC into a dynamic system in which governance, assurance, and materiality interact continuously to sustain adaptability. In this sense, resilience is not an external feature of the organisation but an intrinsic property of its strategic control systems.To translate these theoretical insights into practice, the R-SBSC can be operationalised as a measurable and actionable framework that integrates resilience directly into the core architecture of sustainability-performance management (Figure 2). Table 1 presents the structure of the five R-SBSC dimensions that embed resilience into sustainability-performance management. Beyond its theoretical contribution, the R-SBSC provides a structured method for organisations to translate strategic adaptability into specific managerial practices.

By extending the four classical perspectives of the Balanced Scorecard into five interconnected dimensions (Financial, Customer/Stakeholder, Internal Process, Learning and Growth, and Resilience), the model offers a coherent structure through which resilience can be embedded and monitored alongside sustainability objectives. Each perspective carries indicators that reflect both traditional performance and adaptive capacity. The Financial perspective includes measures such as financial stability, recovery cost ratios, and resource redeployment speed following a disruption. The Customer or Stakeholder perspective evaluates trust retention, stakeholder satisfaction stability, and engagement continuity during crises. The Internal Process perspective focuses on operational redundancy, response time, and continuity planning. Learning and Growth encompass adaptive capacity, digital literacy, and employee readiness for crisis learning. Finally, the Resilience perspective captures environmental risk readiness, supply chain recovery rate, and dynamic capability for adaptation.

## Table 1. Structure of the Five Dimensions of the Resilience-Oriented Sustainability Balanced Scorecard (R-SBSC)

| Perspective | Strategic Focus | Key Indicators | Resilience Contribution | Representative Sources |
|---|---|---|---|---|
| Financial Perspective | Ensuring financial sustainability and recovery capacity under disruption. | Financial stability; recovery cost ratio; resource redeployment speed after disruption. | Reflects financial resilience through liquidity management, rapid resource allocation, and continuity of operations under shocks. | Rafiq et al. (2021); Fatima & Elbanna (2023) |
| Customer/Stakeholder Perspective | Building trust and maintaining stakeholder engagement during crises. | Trust retention; stakeholder satisfaction stability; engagement continuity. | Captures social and reputational resilience, emphasizing stakeholder confidence and relational continuity. | Chourasiya et al. (2024); Khalid et al. (2025) |
| Internal Process Perspective | Strengthening process reliability, responsiveness, and continuity planning. | Operational redundancy; response time; continuity planning. | Enhances process and operational resilience, ensuring that systems remain functional amid internal or external shocks. | Hansen & Schaltegger (2016); Jassem et al. (2022) |
| Learning & Growth Perspective | Developing adaptive capacity, digital literacy, and crisis-readiness skills. | Adaptive capacity; digital literacy; employee readiness for crisis learning. | Embeds cognitive and cultural resilience by fostering organizational learning and continuous adaptation. | Ayele & Singh (2024); Dong et al. (2025) |
| Resilience Perspective | Integrating environmental risk management and dynamic capability for adaptation. | Environmental risk readiness; supply-chain recovery rate; dynamic capability for adaptation. | Represents systemic and strategic resilience, linking sustainability and risk intelligence for long-term competitiveness. | Tuori et al. (2021); Khalid et al. (2025) |

(Source: Authors' own work)

Operationalising the R-SBSC involves a phased integration process that builds on evidence from multi-sectoral applications, such as those discussed by Chourasiya et al. (2024), Khalid et al. (2025), and Tuori et al. (2021). The first stage is identifying critical strategic risks, both endogenous, such as process inefficiencies and control weaknesses, and exogenous, including environmental disruptions and regulatory changes. In the second stage, these risks were mapped onto the five R-SBSC perspectives to establish their relevance and priority. The third stage involves selecting measurable indicators aligned with each perspective using a mix of quantitative KPIs and qualitative assessments, as recommended by sustainability performance frameworks. The fourth stage involves integrating these indicators into the organisation's strategy map and cascading them through the departments and functions.

Finally, the fifth stage involves continuous monitoring through digital dashboards, which enable real-time feedback and predictive analytics for early warning and adaptive decision-making. This iterative process ensures that the R-SBSC remains a living system that constantly learns, recalibrates, and strengthens its resilience capacity. Within this operational framework, the R-SBSC strategy map depicts a cause–effect chain connecting governance, assurance, and materiality to resilience outcomes. Governance provides a foundation for defining accountability and strategic oversight. Assurance validates the credibility of sustainability information and risk management processes. Materiality translation ensures relevance and stakeholder alignment in sustainability reporting. Resilience feedback closes the loop by integrating lessons learned from disruptions into governance.

This continuous feedback reinforces the robustness of the system, illustrating how adaptive performance management replaces static evaluations. Therefore, the model transforms the SBSC from a performance-measurement framework into a dynamic, resilience-building architecture. The operationalisation of the R-SBSC demonstrates its flexibility across industries. In the public health sector, the model can emphasise environmental risk planning and service continuity, as Khalid et al. (2025) did. In manufacturing, supply chain resilience and regulatory compliance can be prioritised, as seen by Chourasiya et al. (2024). For municipalities, as shown by Santos et al. (2025), the emphasis is on reducing climate vulnerability and enhancing adaptive capacity through human and technological resource use. This cross-sector adaptability positions the R-SBSC as both a universal and contextual tool, providing a framework that offers structure while allowing for sector-specific customisation.

In practice, implementing the R-SBSC helps organisations integrate sustainability and resilience as the twin dimensions of strategic control. Managers can use it to visualise the trade-offs between efficiency and adaptability, auditors can employ it to assess the maturity of internal control systems, and regulators can use it as a reference model for CSRD-aligned governance. By institutionalising resilience within the Balanced Scorecard logic, organisations shift from reactive recovery to proactive anticipation and continuous transformation. Thus, the R-SBSC becomes an operational system for embedding resilience thinking within the corporate sustainability strategy, enabling firms to measure not only what they achieve but also how effectively they endure, adapt, and thrive under uncertainty.

## CONCLUSION

This study synthesises the evolution from the Balanced Scorecard (BSC) to the Sustainability Balanced Scorecard (SBSC) and shows that SBSC has progressed into a strategic management system integrating ESG considerations. The review indicates increasing contextualisation through sector-specific designs, yet persistent challenges remain in indicator selection, change resistance, and sustainability data integration. To address the gap between sustainability measurement and resilience

management, this study proposes the Resilience-Oriented SBSC (R-SBSC), embedding adaptive capacity, responsiveness, and strategic risk information within the SBSC cause–effect logic.

Conceptually, the model connects sustainability accounting, performance management, and resilience theory, while offering an implementable pathway for organisations facing endogenous and exogenous disruptions. Future research should validate R-SBSC empirically through longitudinal and cross-sector studies, examine governance–materiality–assurance and digital dashboards as enabling mechanisms, and test its effects on performance, stakeholder trust, and sustainable competitiveness.

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