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Governing Supply Chains through Performance Measurement: Reconceptualizing SCPMS as Inter-Organizational Control Systems

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ABSTRACT

Supply chain performance measurement systems (SCPMS) have traditionally been examined as operational tools for monitoring efficiency, responsiveness, and cost performance. However, their role as mechanisms of managerial control within and across organizational boundaries remains theoretically underexplored. This study presents a systematic literature review of SCPMS research published between 1998 and 2025, synthesizing 112 peer-reviewed journal articles indexed in Scopus and Web of Science. Using a structured review protocol and thematic analysis, the study examines how SCPMS are conceptualized, designed, and deployed, with particular attention to their control functions in inter-organizational supply chains.

The review identifies three dominant research streams: metric-centric frameworks, strategic alignment approaches, and governance-oriented control perspectives. Findings reveal that while SCPMS are widely adopted to support decision-making and performance evaluation, their behavioral and control implications are often implicitly assumed rather than theoretically articulated. By integrating management control theory with supply chain performance literature, this review reconceptualizes SCPMS as active managerial control systems that shape coordination, accountability, and strategic alignment across supply networks. The study contributes to supply chain management theory by advancing a control-oriented framework of SCPMS and outlining future research directions emphasizing behavioral, relational, and governance dimensions.

Keywords: Supply chain performance measurement; Management control systems; Inter-organizational control; Performance metrics; Systematic literature review.

INTRODUCTION

Performance measurement has long been recognized as a foundational element of effective supply chain management. Supply chain performance measurement systems (SCPMS) enable organizations to monitor operational efficiency, assess strategic alignment, and evaluate outcomes across complex networks of interdependent actors (Beamon, 1999; Gunasekaran et al., 2001). As supply chains have become more global, digitally enabled, and relationally embedded, SCPMS have expanded beyond firm-level dashboards to encompass cross-organizational metrics, shared key performance indicators, and collaborative review mechanisms.

Despite this evolution, extant SCPMS research remains predominantly metric-centric. The literature has focused extensively on indicator selection, dimensional balance, and technical system design, while paying comparatively limited attention to the *managerial role* of SCPMS in shaping behavior, coordinating actions, and governing inter-organizational relationships. As a result, SCPMS are often treated as neutral information systems rather than as instruments of managerial control.

In contrast, management control theory conceptualizes performance measurement systems as active mechanisms that influence attention, decision-making, and accountability (Simons, 1995; Merchant & Van der Stede, 2017). In inter-organizational contexts—where hierarchical authority is absent—control is exercised through a combination of contractual,

relational, and information-based mechanisms (Dekker, 2004). Performance measurement is central to these arrangements, yet its control role remains weakly theorized in the supply chain literature.

Addressing this gap, this study develops a **theory-building systematic literature review** of SCPMS research published between 1998 and 2025. Synthesizing 112 peer-reviewed journal articles indexed in Scopus and Web of Science, the study reconceptualizes SCPMS as *inter-organizational managerial control systems*. The paper advances an integrated theoretical framework and a set of propositions that explain how SCPMS function as diagnostic, interactive, and relational control mechanisms, thereby contributing to cumulative theory development in supply chain management.

Against this backdrop, this study undertakes a systematic literature review to examine SCPMS as instruments of managerial control. The review addresses the following research questions:

1. How are supply chain performance measurement systems conceptualized in existing literature?
2. In what ways do SCPMS function as managerial control mechanisms within supply chains?
3. What theoretical gaps persist at the intersection of SCPMS and management control research?

By answering these questions, the study aims to reposition SCPMS within a broader theoretical discourse on control and governance in supply chains.

2. Conceptual Foundations

2.1 Supply Chain Performance Measurement Systems

Early SCPMS studies emerged from operations management and emphasized the inadequacy of purely financial measures for managing supply chain performance (Beamon, 1999). Subsequent research proposed multidimensional frameworks incorporating cost, quality, delivery, flexibility, and customer service (Gunasekaran et al., 2001; Shepherd & Günter, 2006). Later contributions highlighted strategic alignment, integration across partners, and dynamic measurement capabilities, often drawing on the balanced scorecard and performance prism logics (Kaplan & Norton, 1996; Neely et al., 2002).

While these studies significantly advanced measurement practice, SCPMS were largely conceptualized as technical artifacts. Behavioral consequences, power dynamics, and governance implications were typically treated as secondary or implicit considerations.

2.2 Management Control and Inter-Organizational Governance

Management control systems (MCS) are broadly defined as the formal and informal mechanisms used to ensure that organizational actions are consistent with strategic objectives (Merchant & Van der Stede, 2017). Simons' (1995) levers of control framework emphasizes that performance measurement systems can be used diagnostically to monitor outcomes or interactively to stimulate learning and strategic debate.

In inter-organizational relationships, control cannot rely solely on hierarchy. Instead, it is achieved through hybrid governance structures combining contracts, trust, and information sharing (Dekker, 2004; Caglio & Ditillo, 2008). Performance measurement plays a pivotal role by enabling monitoring, coordination, and mutual accountability across organizational boundaries (Van der Meer-Kooistra & Scapens, 2008).

3. Methodology

3.1 Review Design and Objectives

This study adopts a systematic literature review methodology designed explicitly for theory building rather than descriptive aggregation (Tranfield et al., 2003; Denyer & Tranfield, 2009). The review addresses the following research question:
How are supply chain performance measurement systems conceptualized and used as managerial control mechanisms in inter-organizational supply chains?

To examine how supply chain performance measurement systems (SCPMS) are conceptualized and used as managerial control mechanisms in inter-organizational supply chains, this study adopts a **systematic literature review (SLR)** methodology. The review follows a transparent and replicable protocol comprising four stages: literature identification, screening, eligibility assessment, and analytical synthesis. Peer-reviewed journal articles were retrieved from leading academic databases using structured keyword combinations related to supply chain performance measurement, managerial control, inter-organizational governance, and management control systems. Inclusion criteria were restricted to English-language studies that explicitly address SCPMS within multi-firm or networked supply chain contexts.

Rather than aggregating metrics or frameworks descriptively, the selected studies were analyzed using **thematic and theory-informed coding**. Each article was examined for (i) its underlying conceptualization of SCPMS (e.g., technical,

behavioral, strategic), (ii) the types of control mechanisms embedded in measurement systems (diagnostic, interactive, relational, or hybrid), and (iii) the theorized pathways linking measurement to managerial influence and performance outcomes. Drawing on management control systems theory as an analytical lens, the synthesis focuses on identifying dominant control logics, boundary-spanning functions, and implicit assumptions about behavior and coordination across organizational interfaces. This approach enables a structured comparison across fragmented literatures and supports the development of an integrative understanding of SCPMS as governance and control mechanisms in inter-organizational supply chains.

3.2 Search Strategy and Selection Criteria

A comprehensive search was conducted in Scopus and Web of Science databases using combinations of keywords related to SCPMS (e.g., "supply chain performance measurement," "SC performance metrics") and control/governance (e.g., "management control," "inter-organizational control," "governance").

Articles were included if they: (1) were peer-reviewed journal publications, (2) explicitly addressed SCPMS or closely related constructs, and (3) were published between 1998 and 2025. After screening titles, abstracts, and full texts, 112 articles were retained for analysis.

3.3 Analytical Procedure

The analysis followed an iterative coding process. First-order codes captured SCPMS conceptualizations and stated purposes. Second-order codes identified implied control logics. Through abstraction and constant comparison, these codes were synthesized into higher-order control mechanisms, enabling theoretical integration and proposition development.

4. Synthesis of the Literature: From Metrics to Control

4.1 Diagnostic Control Logic in SCPMS Research

A substantial portion of SCPMS literature reflects a diagnostic control logic, wherein performance measures are used to monitor outcomes against predefined targets (Simons, 1995). Metric-centric frameworks emphasize efficiency, cost control, and service reliability through standardized indicators and variance analysis (Beamon, 1999; Gunasekaran et al., 2001). While effective for ensuring accountability, such systems tend to privilege compliance over learning.

4.2 Interactive Control Logic and Strategic Alignment

A second stream of research implicitly adopts an interactive control perspective. Studies focusing on strategic alignment argue that SCPMS guide managerial attention, support cross-functional dialogue, and facilitate joint problem-solving across supply chain partners (Kaplan & Norton, 1996; Neely et al., 2005). Here, performance measurement functions as a platform for learning and adaptation rather than mere monitoring.

4.3 Relational Control and Governance-Oriented SCPMS

A smaller but theoretically significant body of literature explicitly frames SCPMS as governance mechanisms embedded in inter-firm relationships. Drawing on transaction cost economics and relational governance, these studies highlight how shared metrics enhance transparency, trust, and mutual accountability, thereby mitigating opportunism (Dekker, 2004; Van der Meer-Kooistra & Scapens, 2008).

5. Theory Development: SCPMS as Inter-Organizational Control Systems

Synthesizing the reviewed literature, this study reconceptualizes SCPMS as inter-organizational managerial control systems comprising three interrelated control mechanisms: diagnostic, interactive, and relational control. These mechanisms operate simultaneously and configurationally, shaping behavior and coordination across supply networks.

Proposition 1. SCPMS emphasizing diagnostic control enhance efficiency and accountability but may constrain adaptability under conditions of high environmental uncertainty.

Proposition 2. Interactive use of SCPMS strengthens strategic alignment and joint problem-solving among supply chain partners.

Proposition 3. Relationally embedded SCPMS reduce opportunistic behavior by reinforcing trust, transparency, and mutual accountability.

Proposition 4. The performance impact of SCPMS depends on the balanced configuration of diagnostic, interactive, and relational control mechanisms rather than reliance on a single control logic.

Figure 1 below presents an integrative conceptual framework linking supply chain context, SCPMS control mechanisms, and performance outcomes.

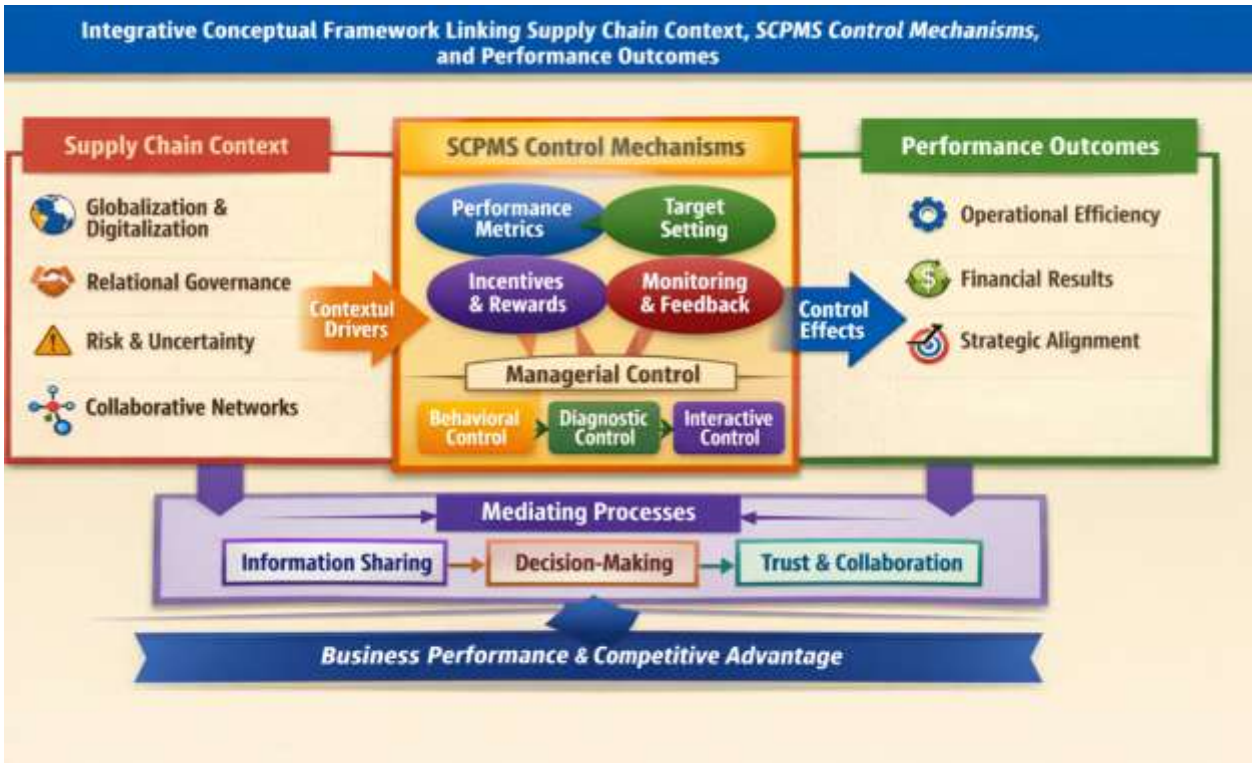

Figure 1: An integrative conceptual framework linking supply chain context, SCPMS control mechanisms, and performance outcomes.

6. Implications

6.1 Theoretical Implications

This study advances supply chain management theory by (1) shifting SCPMS conceptualization from technical measurement tools to managerial control systems, (2) integrating management control theory with SCPMS research, and (3) providing a coherent framework and propositions that support cumulative theory building.

6.2 Managerial Implications

For practitioners, the findings suggest that effective SCPMS design requires deliberate consideration of control use. Managers should balance monitoring efficiency with learning-oriented interaction and relational governance to manage complex supply chains effectively.

7. Future Research Agenda

The theory-building reconceptualization advanced in this review opens several promising and underexplored avenues for future research. Moving beyond the dominant emphasis on metric design and performance outcomes, future studies should explicitly examine SCPMS as *managerial control systems* that shape behavior, relationships, and governance structures across supply chains. Three interrelated research directions are particularly salient for advancing cumulative theory.

First, future research should focus on the **behavioral and micro-foundational effects** of SCPMS. While performance measures are often assumed to be objective and neutral, management control theory suggests that they fundamentally influence managerial attention, motivation, and sensemaking. Empirical studies are needed to investigate how different control uses of SCPMS—diagnostic, interactive, and relational—affect decision-making, learning, opportunism, and conflict resolution among supply chain partners. Experimental designs, surveys, and in-depth qualitative studies could shed light on how managers interpret shared performance metrics, how these interpretations differ across organizational roles, and how they translate into cooperative or defensive behaviors.

Second, future studies should adopt **context-sensitive and contingency-based perspectives**. The review indicates that SCPMS are deployed in highly heterogeneous supply chain settings characterized by varying levels of environmental uncertainty, asset specificity, power asymmetry, and institutional embeddedness. Future research should explicitly theorize and empirically test how these contextual conditions shape the configuration and effectiveness of SCPMS as control systems. For example, under what conditions do diagnostic controls dominate interactive or relational controls? When do SCPMS substitute for relational governance, and when do they complement it? Comparative and multi-level research designs would be particularly valuable for identifying such boundary conditions and advancing contingency-based theory.
Third, there is a need to examine the **dynamic and evolutionary nature** of SCPMS. Most existing research adopts a static snapshot view of performance measurement systems, implicitly assuming stability over time. However, supply chains increasingly operate in environments marked by digitalization, sustainability pressures, and frequent strategic reconfiguration. Longitudinal studies are needed to explore how SCPMS evolve as relationships mature, as power structures shift, and as digital technologies enable real-time data sharing and advanced analytics. Such research would contribute to a processual understanding of control, demonstrating how SCPMS both shape and are reshaped by inter-organizational interactions.

Finally, future research should engage more deeply with **emerging phenomena**, such as digital platforms, ecosystem-based supply chains, and sustainability-oriented performance measurement. These contexts challenge traditional control assumptions and offer fertile ground for extending the proposed framework. Collectively, these research directions position SCPMS as a central empirical domain for advancing theory at the intersection of supply chain management, management control, and inter-organizational governance.

8. CONCLUSION

This study set out to reconceptualize supply chain performance measurement systems by shifting the analytical focus from metrics and technical frameworks to their underlying role as inter-organizational managerial control systems. Through a theory-building systematic literature review of 112 peer-reviewed articles published between 1998 and 2025, the paper demonstrates that SCPMS research has been dominated by metric-centric and alignment-oriented perspectives, while the behavioral, relational, and governance implications of performance measurement have remained insufficiently theorized.
By integrating insights from management control theory and inter-organizational governance research, this review advances a control-oriented understanding of SCPMS. Rather than passive reporting tools, SCPMS are conceptualized as active systems of diagnostic, interactive, and relational control that shape coordination, accountability, and strategic alignment across organizational boundaries. This integrative perspective provides a coherent explanation for why similar performance measurement practices can yield divergent outcomes across supply chains and clarifies the mechanisms through which SCPMS influence both performance and relationships.

The study makes several theoretical contributions. First, it extends supply chain management theory by embedding SCPMS within a broader control and governance architecture, responding to long-standing calls for stronger theoretical grounding in performance measurement research. Second, it contributes to the management control literature by demonstrating how control systems operate beyond firm boundaries in complex, multi-actor supply networks. Third, by articulating a set of propositions and an integrative framework, the paper establishes SCPMS as a generative construct for future theory development and empirical inquiry.

From a managerial perspective, the findings underscore that SCPMS should not be treated as neutral or purely technical artifacts. The design and use of performance measurement systems inevitably influence inter-firm relationships, signal strategic priorities, and shape incentives. Recognizing SCPMS as managerial control systems enables practitioners to deploy them more deliberately, balancing monitoring with learning and accountability with trust to support sustainable and strategically aligned supply chains.

In conclusion, this review repositions SCPMS at the core of supply chain governance and managerial control. By explicating their control functions and theoretical significance, the study provides a coherent platform for cumulative research and offers a clear pathway for advancing both theory and practice in supply chain performance management.

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