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https://doi.org/10.1590/1982-7849rac2027250290.en

Submitted on: 2026-11-13
Posted on: 2026-11-16 (version 1)
(YYYY-MM-DD)

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THE ROLE OF MANAGEMENT CONTROL SYSTEMS IN ORGANIZATIONAL AMBIDEXTERITY. A SYSTEMATIC LITERATURE REVIEW

O PAPEL DOS SISTEMAS DE CONTROLE GERENCIAL NA AMBIDESTRIA ORGANIZACIONAL: UMA REVISÃO SISTEMÁTICA DA LITERATURA

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ABSTRACT

This article investigates, through a Systematic Literature Review (SLR), how management control systems (MCS) relate to organizational ambidexterity in organizations engaged in exploration and exploitation. The analysis is grounded in the Levers of Control framework and the TCCM model. Thirty-seven articles published or made available online between 2003 and December 31, 2024, were selected from Scopus and Web of Science databases. The review followed the PRISMA guidelines and included bibliometric analysis. The results indicate that management control systems (MCS), including performance measurement systems (PMS), are associated with the exploration-exploitation balance. Key findings include: (1) complex costing systems are associated

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with ambidexterity in exploitation-oriented settings; (2) balanced performance measures combining short- and long-term, financial and non-financial indicators are associated with alignment; (3) MCS are associated with learning through the integration of exploratory and exploitative knowledge; and (4) their relationships with ambidexterity vary across organizational contexts. This study highlights the role of control systems in relation to organizational ambidexterity and offers insights for decision-makers seeking to integrate innovation and efficiency.

Keywords: Ambidexterity; Exploration; Exploitation; Management Control Systems; Performance Management; Innovation.

RESUMO

Este artigo investiga, por meio de uma Revisão Sistemática da Literatura (RSL), como os sistemas de controle gerencial (MCS) se relacionam com a ambidestria organizacional em organizações envolvidas em atividades de exploração e explotação. A análise fundamenta-se no modelo Levers of Control e no modelo TCCM. Foram selecionados, nas bases Scopus e Web of Science, 37 artigos publicados ou disponibilizados online entre 2003 e 31 de dezembro de 2024. A revisão seguiu as diretrizes PRISMA e incluiu uma análise bibliométrica. Os resultados indicam que os sistemas de controle gerencial (MCS), incluindo os sistemas de mensuração de desempenho (PMS), estão associados ao equilíbrio entre exploração e explotação. Os principais achados incluem: (1) sistemas de custeio complexos estão associados à ambidestria em contextos orientados à explotação; (2) medidas de desempenho balanceadas, que combinam indicadores de curto e longo prazo, financeiros e não financeiros, estão associadas ao alinhamento; (3) os MCS estão associados à aprendizagem por meio da integração de conhecimentos exploratórios e explotatórios; e (4) suas relações com a ambidestria variam entre diferentes contextos organizacionais. Este estudo destaca o papel dos sistemas de controle em relação à ambidestria organizacional e oferece contribuições para os tomadores de decisão que buscam integrar inovação e eficiência.

Palavras-chave: Ambidestria; Exploração; Explotação; Sistemas de Controle Gerencial; Mensuração de Desempenho; Inovação.

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1. Introduction

The theme of organizational ambidexterity has been widely discussed in dynamic, competitive markets, where the ability to innovate while remaining efficient is a key factor in organizational survival and growth. Studies indicate that companies that balance exploration and exploitation can better respond to changes in the external environment, introduce innovations, and sustain effective operations (O'Reilly & Tushman, 2008; Raisch & Birkinshaw, 2008). Thus, investigating the factors associated with organizational ambidexterity is vital to understanding the processes that contribute to companies' adaptation and performance (Lavie et al., 2010).

Organizational ambidexterity is the ability to balance exploration and exploitation simultaneously. Exploration involves searching for new alternatives, experimentation, and discovery, while exploitation focuses on refining and efficiently using existing resources and knowledge (March, 1991; O'Reilly & Tushman, 2008; Popadiuk & Luz, 2018). This balance is essential for companies looking to innovate while optimizing processes. This study is based on the premise that organizational ambidexterity is a complex management challenge that requires a simultaneous balance between innovation and efficiency (Smith & Lewis, 2011). Based on this understanding, this review examines how management control systems relate to these tensions, particularly through different patterns of use and combinations of control levers across innovation modes (Bedford, 2015). In this study, performance measurement systems (PMS) are treated as a subset of MCS, following prior literature that conceptualizes MCS as a broader package of control mechanisms (Chenhall, 2003; Malmi & Brown, 2008; Merchant & Van der Stede, 2017). This distinction is maintained throughout the analysis, as prior studies examine MCS and PMS with different scopes and analytical roles. Thus, it is not a matter of opposing control and ambidexterity but rather of understanding how existing control mechanisms are discussed in the literature in relation to this balance. This perspective positions MCS as organizational arrangements associated with the ambidextrous demands of contemporary organizations.

Achieving organizational ambidexterity is challenging because it requires managing conflicting demands and allocating limited resources efficiently (Lavie et al., 2010). In this context, MCS have been examined as organizational mechanisms that provide relevant, timely information for decision-making and support the balance between exploration and exploitation (Hall, 2010).

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Previous literature reviews have examined organizational ambidexterity and management control from different perspectives. Gschwantner and Hiebl (2016) provide a narrative synthesis of MCS and ambidexterity, whereas Saleh et al. (2023) and AlKhamees and Durugbo (2025) focus primarily on innovation ambidexterity. Marín-Idárraga et al. (2022) examine the performance implications of exploration and exploitation, while Burkert and Grossrieder (2025) concentrate on management controls at the individual level. Consequently, evidence on the roles attributed to MCS remains dispersed across levels of analysis, organizational contexts, and methodological approaches.

This review integrates evidence on the roles attributed to MCS across different levels of analysis, organizational contexts, and methodological approaches. The synthesis identifies three recurring patterns: the provision of information for decision-making, the combined use of different control practices to coordinate exploration and exploitation, and the dependence of these relationships on organizational and contextual conditions (Bedford, 2015; Lee & Widener, 2016; Bedford et al., 2019; Mura et al., 2021; Antonini & Gomez-Conde, 2024). Thus, the review shifts attention from whether particular controls facilitate ambidexterity to the configurations and conditions under which MCS are associated with organizations' simultaneous pursuit of exploration and exploitation. This critical integration provides the basis for the proposed framework and research agenda (Chimenti, 2025; Leal & Chimenti, 2026).

Recent studies have examined management control practices in relation to ambidextrous organizations. Daowadueng et al. (2023) examined the mediating role assigned to costing system design choices in exploration-oriented contexts. Bedford et al. (2019) examined how balanced performance measures and their intensive use in debate generate cognitive conflict and contribute to translating competence ambidexterity into innovation ambidexterity, while McCarthy and Gordon (2011) proposed a framework to integrate formal and informal controls in the context of contextual ambidexterity. Other studies, such as Ylinen and Gullkvist (2014), have explored the relationships between different forms of management control and exploratory and exploitative innovation projects.

In addition, Cao and Jiang (2022) and Getele and Ruoliu (2024) examined specific practices, including social support, creativity, and performance management, associated with organizational ambidexterity across contexts, including SMEs in the Global South.

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These studies highlight the role of adapted control systems, balanced performance measurements, and leadership support in managing the tensions between innovation and efficiency (Jansen et al., 2006).

This study seeks to answer the following question: "How are MCS associated with organizational ambidexterity involving exploration and exploitation?" Based on evidence extracted from the literature, the objective is to examine the roles attributed to MCS and how different control practices relate to organizations' simultaneous pursuit of exploration and exploitation across levels of analysis and organizational contexts. The review specifically examines information provision, the combined use of control practices, and the contextual conditions associated with these relationships.

Finally, this review contributes to the literature by analyzing how MCS are discussed in relation to the challenges of organizational ambidexterity. Research suggests that these systems are associated with decision-making processes in companies facing conflicting demands through performance information, managerial debate, and the coordination and allocation of exploratory and exploitative activities (Bedford et al., 2019; Ylinen & Gullkvist, 2014). Examining these relationships provides a basis for a more detailed analysis of the theme and offers insights into how organizations manage the tensions between exploration and exploitation in competitive scenarios to achieve greater performance and results (March, 1991; Cao et al., 2009).

2. **Theoretical Framework**

This section synthesizes the main theoretical foundations that support the relationship between organizational ambidexterity and management control practices, drawing on classical and contemporary studies that inform the analytical perspective adopted in this review.

The concept of organizational ambidexterity originates in the seminal work of Duncan (1976), who introduced the idea that organizations must design a dual organizational structure to balance adaptability **(**innovation**)** and alignment (efficiency). Duncan highlighted that organizational structures must adjust over time to align with the different phases of the innovation process, alternating between initiation and implementation. March (1991) expanded on these fundamentals by developing the concepts of exploration and exploitation as fundamental modes of learning and organizational adaptation. He defined exploitation as "refinement, choice, production,

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efficiency, selection, implementation, execution," and exploration as "searching, variation, risk-taking, experimentation, flexibility, discovery, innovation." March argued that organizations need to balance these activities to ensure both short-term performance and long-term survival.

Based on these ideas, this review examines how MCS have been conceptualized as organizational arrangements that manage these tensions. Tushman and O'Reilly (1996) proposed structural ambidexterity, with distinct subunits for exploration and exploitation, while Gibson and Birkinshaw (2004) introduced contextual ambidexterity, centered on individuals' flexibility within appropriate organizational environments. O'Reilly and Tushman (2008) defined ambidexterity as the ability to explore and exploit simultaneously, highlighting its dynamic and adaptive nature. Raisch and Birkinshaw (2008) and Simsek (2009) deepened the understanding of the phenomenon by proposing typologies and identifying contextual and behavioral factors that influence ambidexterity. Subsequent research has examined ambidexterity across organizational contexts and levels of analysis, including process-management orientations, top management integration, entrepreneurial universities, and individual antecedents (Benner & Tushman, 2003; Lubatkin et al., 2006; Chang, 2016; Centobelli et al., 2019; Zhang et al., 2019).

A critical dimension that remains underdeveloped in the literature on ambidexterity is intertemporal tension, that is, the dilemma between short- and long-term objectives. Exploitation tends to favor immediate goals of efficiency and operational performance, while exploration requires investments to achieve future results, such as innovation, new knowledge, technological training, and financial returns (March, 1991; Laverty, 1996). Wang et al. (2019) conceptualize this challenge as temporal ambidexterity: the organizational ability to maintain simultaneous, strong commitments to actions across different time horizons. Empirical research associates temporal ambidexterity with managers' ability to reconcile conflicting temporal priorities. Suzuki and Methé (2011), for example, indicate that the strategic value of exploratory innovation depends on the balance between short-term initiatives and longer-term exploratory investments.

In this context, the literature describes MCS as organizational arrangements that coordinate exploration and exploitation. Managerial control is the process by which managers ensure that resources are obtained and used effectively and efficiently to achieve organizational objectives (Anthony, 1965). This process occurs within

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parameters defined by strategic planning, ensuring operational decisions align with organizational guidelines. Anthony (1965) also notes that MCS comprise interdependent subsystems whose coherence is essential for effective strategy implementation.

In this review, the Levers of Control framework provides the conceptual basis for understanding how different types and uses of control systems relate to exploration and exploitation. More recent literature has explored how MCS can be used in ways that are associated with ambidexterity. Bedford (2015) reports that the performance implications of the individual and combined use of control levers vary across innovation modes. In ambidextrous firms, diagnostic and interactive control systems exhibit interdependent effects on performance. This approach aligns with the Levers of Control model (Simons, 1994), which provides a framework for examining how different uses of MCS relate to the tension between control and flexibility in ambidextrous settings.

Research on MCS has advanced through studies examining how control practices are designed, used, and combined in relation to organizational objectives and contextual conditions (Chenhall, 2003; Henri, 2006). Configuration-based research considers how multiple controls operate jointly as packages (Bedford & Malmi, 2015; Merchant & Otley, 2020), while the Levers of Control framework distinguishes diagnostic, interactive, belief, and boundary systems and their interrelationships (Simons, 1994, 2014; Tessier & Otley, 2012; Martyn et al., 2016). Together, these perspectives provide a basis for examining how control systems relate to strategic implementation, stability, and adaptability.

Simons (1994) defines MCS as formal, information-based routines used to maintain or change patterns in organizational activities. These systems play central roles in implementing strategies, coordinating activities, communicating goals, and evaluating performance. In his Levers of Control model, Simons distinguishes four types of systems: diagnostic control systems, which monitor results and correct deviations based on predefined standards; interactive control systems, which involve managers in decisions related to strategic uncertainties; belief systems, which communicate core values and guide organizational direction; and boundary systems, which establish clear rules and boundaries for acceptable behavior.

This study examines the relationship between the diagnostic and interactive uses of performance measurement systems (PMS) and organizational ambidexterity. Mura et al. (2021) describe this combination as a dynamic tension associated with the simultaneous pursuit of exploration and exploitation. Diagnostic controls relate to

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performance monitoring, stability, and operational efficiency, whereas interactive controls relate to managerial dialogue, learning, and innovation. The concurrent use of these controls therefore relates to how organizations allocate resources and adapt their strategies under uncertainty. Accordingly, PMS are treated as specific control practices within the broader MCS framework.

Several empirical studies have examined MCS configurations and uses relevant to organizational learning and ambidexterity. Widener (2007) investigated the relationships among strategic risks, the use of the four levers of control, organizational learning, and performance, while Kruis et al. (2016) identified alternative configurations through which organizations balance the four levers of control. Mura et al. (2021) found that the dynamic tension between the diagnostic and interactive uses of PMS is associated with organizational ambidexterity. Collectively, these studies indicate that the relationships between control systems, exploration, and exploitation depend on how controls are used and combined.

In this sense, Severgnini et al. (2018) associate PMS dimensions, such as focus of attention, legitimacy, and the provision of information for strategic decisions, with organizational ambidexterity and performance. Bisbe and Otley (2004) report that the relationship between interactive MCS use and innovation varies according to prior innovation levels. Interactive use was positively associated with innovation in less innovative firms, whereas the relationship differed in highly innovative contexts. These findings indicate that the association between interactive use and innovation depends on context.

Widener (2007) identifies relationships among strategic uncertainties, MCS use, organizational learning, and performance outcomes. Mundy (2010), in turn, notes that the distinction between diagnostic and interactive uses lies in how systems are employed. While diagnostics maintain control and efficiency, interactive uses stimulate the exploration of new opportunities and create productive tensions between control and flexibility, which the literature associates with organizational performance in volatile environments.

The literature also shows that MCS play distinct roles throughout organizational change processes. Chenhall and Euske (2007) show that these systems contribute from creating the initial impulse for transformation to consolidating new practices. Davila et al. (2009), on the other hand, when analyzing startups, find that both internal factors (such

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as learning and executing strategies) and external factors (such as the need for legitimation) drive control system adoption.

The literature describes the integration of MCS and ambidextrous learning as associated with both operational efficiency and innovation. Wall (2020) points out that the adjustment of control systems in growing companies is conditioned by the complexity of the tasks and the strategies adopted. Higher complexity is associated with greater hierarchical coordination, while exploratory strategies push organizational boundaries to pursue innovation. In this context, Zhao et al. (2020) link the combination of power-sharing and leader control behaviors to exploratory and exploitative team learning, creativity, and performance.

The literature suggests that this duality, when examined in relation to management control systems, allows for the capture, integration, and application of knowledge from different fronts of action. Thus, the literature associates contextually aligned MCS with how organizations address strategic uncertainties and combine exploration and exploitation.

3. **Methodology**

To address the central research question of how management control systems (MCS) relate to organizational ambidexterity in organizations engaged in exploration and exploitation, this study adopts a systematic literature review design. The methodological approach followed the principles proposed by Tranfield et al. (2003), allowing the identification, evaluation, and structured synthesis of the available evidence on the subject. The review followed the PRISMA guidelines (Moher et al., 2009) and used the PRISMA Flow Diagram to document the study selection and search process, ensuring transparency, methodological rigor, and reproducibility. This protocol follows recommendations for conducting structured reviews in accounting research, ensuring transparency and methodological rigor (Massaro et al., 2016). In addition, we used bibliometric techniques as complementary analytical tools to map patterns in the literature, without making them the primary methodological approach. Accordingly, the study combines systematic review procedures with complementary bibliometric analysis to enhance transparency and analytical depth. Through this systematic review, we sought to understand how MCS relate to decision-making, organizational integration, and the balance between exploration and exploitation. We systematically coded the extracted data

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by study characteristics, including study type, methodology, level of analysis, and the role of MCS, supporting the structured synthesis presented in Appendix B.

We conducted searches on April 21, 2026, in Scopus and the Web of Science Core Collection, covering eligible articles published between 2003 and 2024. We considered studies eligible if they were first published online by December 31, 2024, even if they were later assigned to a journal issue published in 2025. The same conceptual search strategy was applied in both databases, with adaptations to their respective syntax and searchable fields. In Scopus, the search was conducted in the title, abstract, and keyword fields using: TITLE-ABS-KEY ((AMBIDEXT* OR (EXPLOITATION AND EXPLORATION)) AND (PERFORMANCE OR OUTCOME* OR SUCCESS OR FAILURE) AND ("MANAGEMENT CONTROL" OR "PERFORMANCE MANAGEMENT" OR MCS OR PMS)). In the Web of Science Core Collection, the Topic field was searched using: TS=((AMBIDEXT* OR (EXPLOITATION AND EXPLORATION)) AND (PERFORMANCE OR OUTCOME* OR SUCCESS OR FAILURE) AND ("MANAGEMENT CONTROL" OR "PERFORMANCE MANAGEMENT" OR MCS OR PMS)). In Scopus, the search was limited to Business, Management and Accounting and Economics, Econometrics and Finance. In Web of Science, it was limited to Business, Management, Economics, and Business Finance. In both databases, the document type was restricted to articles published in English, Portuguese, or Spanish. The searches retrieved 70 records from Scopus and 74 from Web of Science, for a total of 144 records.

After removing 25 duplicate records, we screened the titles and abstracts of the remaining 119 records against the inclusion and exclusion criteria established in the research protocol (Moher et al., 2009; Tranfield et al., 2003). The inclusion criteria comprised studies addressing ambidexterity, understood as the balance between exploration and exploitation, and management control practices; empirical, conceptual, review-based, or simulation-based studies published in peer-reviewed journals; studies first published or made available online between 2003 and December 31, 2024; and full-text availability. Exclusion criteria included studies that did not address ambidexterity and management control practices, research not published in peer-reviewed journals, articles first published or made available online outside the 2003–2024 period, and articles without full-text access. At this stage, 46 records were excluded: 42 did not address ambidexterity and management control practices, 2 were not published in peer-

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reviewed journals (book chapters), 1 was published outside the 2003–2024 period, and 1 did not have full-text access. Consequently, 73 articles proceeded to full-text assessment.

During the full-text assessment, 36 articles were excluded. Of these, 29 did not address ambidexterity and management control practices jointly, and seven did not meet the criterion of publication in a peer-reviewed journal. Therefore, the final sample comprised 37 studies. This selection process ensured that all studies included in the final analysis were aligned with the research objectives and the eligibility criteria established in the protocol, as shown in Figure 1.

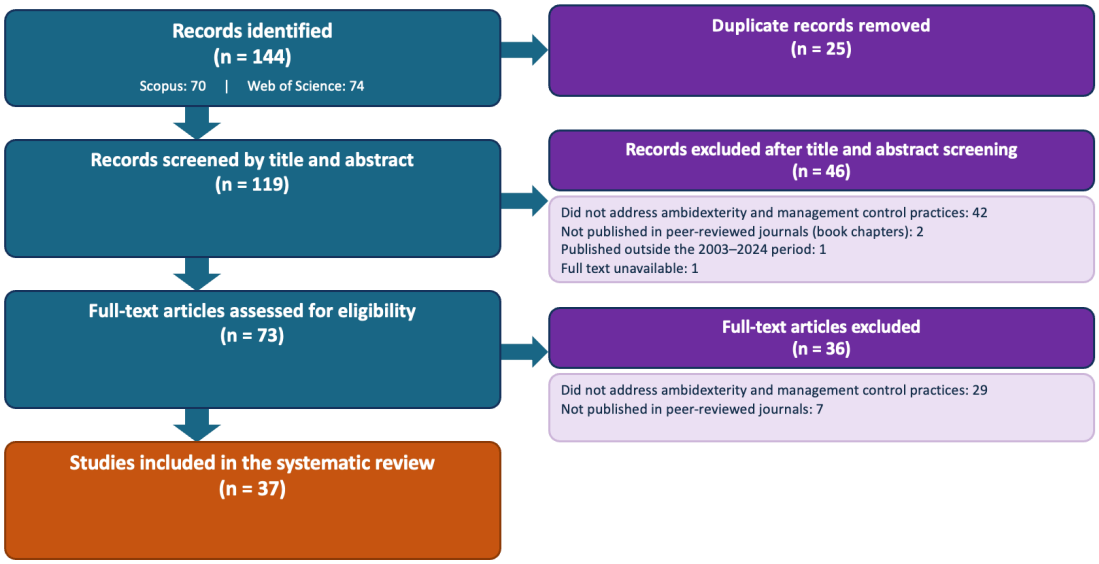
The first author conducted title and abstract screening, full-text assessment, and initial data coding. The two coauthors subsequently reviewed the screening results and coding classifications. The first author addressed comments from this review by re-examining the original studies and, when necessary, revising the corresponding classifications. Because multiple coders did not conduct the procedures independently, we did not calculate a formal inter-coder agreement statistic.

We coded study type as empirical quantitative, empirical qualitative, mixed methods, conceptual, simulation-based, narrative review, or systematic review. Methodology referred to the research design and analytical approach reported by the original study. Level of analysis was determined by the primary unit in which ambidexterity or the relevant control relationship was examined, including individual, team or unit, organizational, and interorganizational levels. The analytical role of MCS was coded according to its explicit position in the theoretical or empirical model. In contrast, the conceptual or organizational function represented the role MCS played in the study’s arguments and findings.

Figure 1. Systematic review flow of the literature

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Source: Prepared by the authors

In addition, the literature on ambidexterity research is fragmented in theories, concepts, and constructs, as noted in prior reviews (Raisch & Birkinshaw, 2008). For example, the literature offers inconsistent definitions of organizational ambidexterity (Simsek, 2009), and researchers have not been explicit in their use of terms such as contextual, sequential, and realized ambidexterity (Lin & McDonough, 2011). Thus, our review synthesizes and integrates fragmented knowledge on ambidexterity and MCS by adopting a framework-based perspective grounded in the TCCM structure [Theories, Contexts, Characteristics, and Methodology]. According to Kumar et al. (2019), logically synthesizing previous research not only advances a topic or theme but also provides researchers with up-to-date insights into a specific research topic and helps identify research gaps.

4. Findings

This chapter presents the study's findings based on a descriptive bibliometric analysis, including co-authorship and co-occurrence mapping, as well as an overview of the journals most frequently connected in the field's network. In addition, a content analysis examines the most relevant articles identified in the systematic review and explores the thematic clusters that emerge from the literature. Bibliometric procedures were applied to map relational structures and thematic concentrations within the field, complementing the qualitative synthesis conducted in the content analysis.

4.1 Bibliometric analysis

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The co-authorship graph, shown in Figure 2, exhibits a highly sparse collaboration structure, characterized by a single cohesive group and several isolated authors. The only identifiable cluster comprises Bedford, David S., Sweeney, Breda, and Bisbe, Josep, indicating a recurring collaboration pattern among these three researchers. All other authors in the map, including Ahmad, Bilal, Micheli, Pietro, Gomez-Conde, Jacobo, and Wall, Friederike, appear as isolated nodes with no co-authorship connections to the rest of the network. This configuration suggests that the literature in this domain is predominantly composed of independent contributions, with collaboration concentrated in a single small group and no central author exerting broad integrative influence across studies.

Figure 2. Co-authorship network



Source: Prepared by the authors using VOSviewer.

The bibliometric analysis presented in Figure 3 shows a dense and interconnected network of keywords, in which ambidexterity occupies the most central position. This term connects directly to innovation, management control systems, performance measurement systems, exploitation, and knowledge, illustrating how the literature links strategic adaptation, innovation processes, and control mechanisms. The temporal color scale indicates a gradual evolution of themes. Earlier studies tend to focus on performance management, alliance performance, exploitation, and organizational learning. At the same time, more recent publications emphasize innovation ambidexterity, creativity, entrepreneurial dynamics, and knowledge integration, as well as adaptive and digital approaches.

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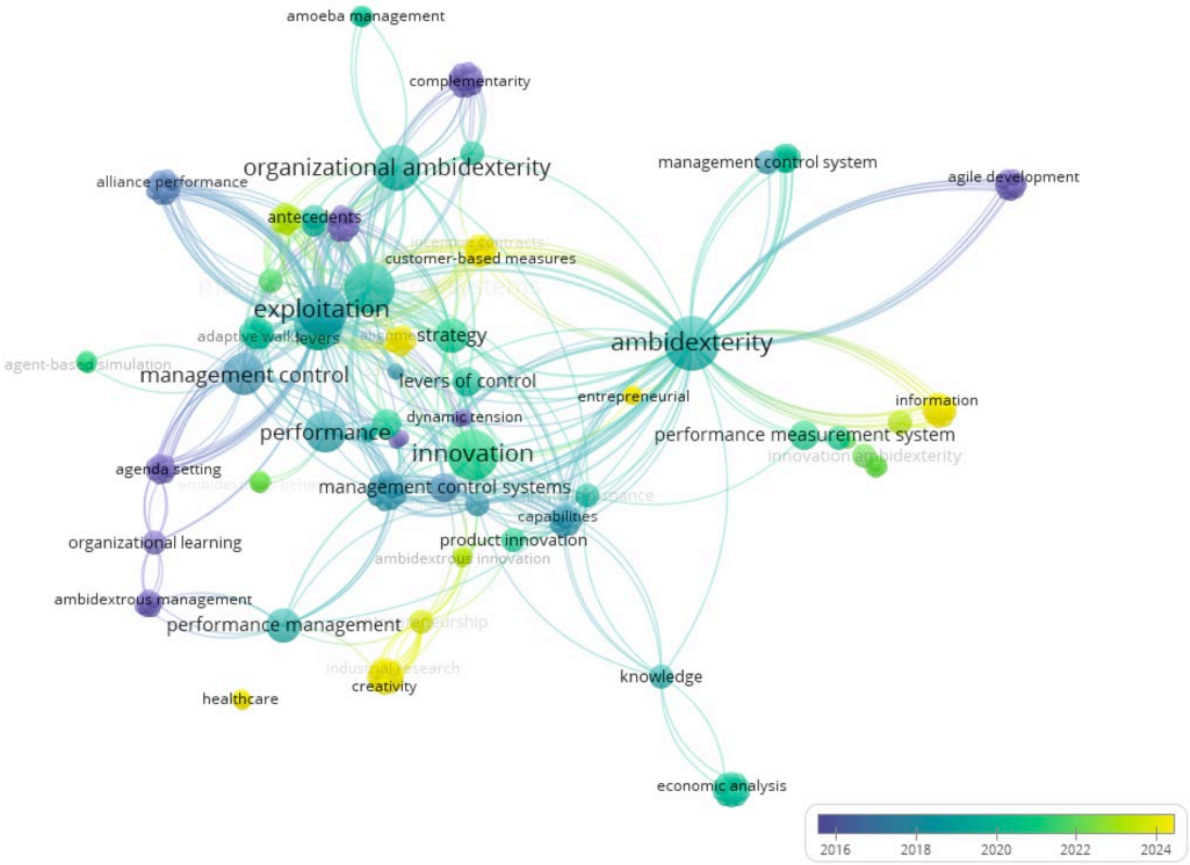
Three main clusters emerge from the network structure. The first centers on ambidexterity and includes associated terms such as innovation, entrepreneurial activities, knowledge, product innovation, and performance measurement systems. This grouping reflects the consolidation of research on the relationships among ambidextrous capabilities, simultaneous innovation, and organizational adaptation. The second cluster centers on management control and management control systems, with connections to performance management, levers of control, dynamic tension, and customer-based measures. This suggests an emphasis on the design and use of management control systems (MCS) in relation to strategy execution and the balance between exploration and exploitation. The third cluster is anchored in exploitation, linking to performance, adaptive work, strategy, antecedents, and organizational learning. This area highlights discussions on efficiency-oriented processes and incremental improvement within ambidextrous settings. Agile development also appears as a distinct but connected theme, indicating the incorporation of iterative and flexible practices into discussions of organizational ambidexterity.

The temporal evolution of keywords also reveals the emergence of concepts such as amoeba management. This decentralized structure is based on small autonomous units with internal financial responsibility, promoting transparency, adaptation, and collaborative participation in organizational performance. According to Inamori (2013), amoeba management aims to create market-oriented divisional accounting, develop leaders with managerial awareness, and foster collective responsibility. Its presence among recent publications indicates an expanding interest in organizational forms that combine flexibility and coordination in settings involving exploration and exploitation.

Figure 3. Co-occurrence of Keywords

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Source: Prepared by the authors using VOSviewer.

The bibliographic coupling analysis shown in Figure 4 presents a network characterized by a concentrated set of documents that share references. Bedford's works, particularly Bedford (2015) and Bedford et al. (2019), occupy the most central positions in the network. These documents link to several other documents, indicating that they rely on reference bases frequently used in studies of management control systems, innovation, and organizational ambidexterity. Ramesh et al. (2012) also appears as a relevant node, linking earlier discussions on distributed development and ambidexterity with more recent contributions. McCarthy and Gordon (2011) and Gschwantner and Hiebl (2016) belong to the same interconnected area, reinforcing their alignment with the foundational literature on control, performance, and organizational learning.

The visualization reveals two main clusters. The first includes Bedford (2015), McCarthy and Gordon (2011), Lee and Widener (2016), Zhao et al. (2020), and Severgnini et al. (2018). These studies draw on theoretical and empirical references concerning management control and its relationships with innovation and performance. The second cluster centers on Ramesh et al. (2012) and includes Adler et al. (2020),

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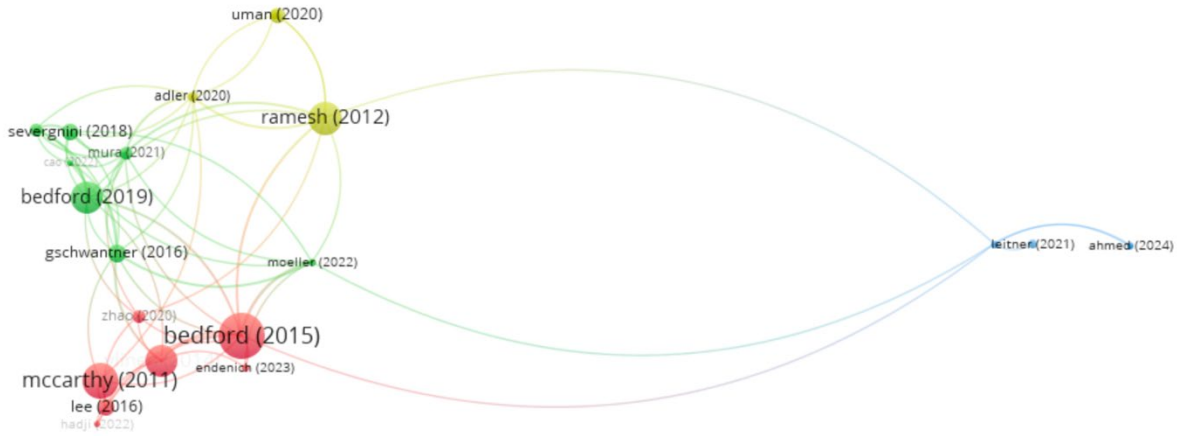
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Umans et al. (2020), Mura et al. (2021), and Möller et al. (2022). This grouping indicates continuity in the shared reference base concerning knowledge integration, organizational learning, and coordination in dynamic contexts.

A distinct trajectory appears on the right side of the map, where Leitner and Wall (2021) connect with Ahmad et al. (2024). These studies form a peripheral but identifiable linkage, indicating the incorporation of more recent perspectives based on a distinct set of shared references. Endenich et al. (2023) remain close to the central area but have fewer connections, reflecting a partial overlap with the references used by the core studies.

Overall, the map's structure shows that the literature is anchored in a small set of frequently coupled documents, primarily clustered around Bedford's contributions, while newer studies gradually expand the thematic landscape by introducing additional reference patterns.

Figure 4. Bibliographic coupling by documents.



Source: Prepared by the authors using VOSviewer.

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The first gap concerns the thematic fragmentation visible in the co-occurrence map. Although exploitation, innovation, and management control appear conceptually related, they remain distinct clusters: exploitation aligns with performance and strategy, innovation connects to product development and capabilities, and management control occupies an intermediate yet non-integrated position. This separation indicates that few studies examine how control mechanisms are associated with exploration and exploitation simultaneously within a unified framework, revealing an opportunity for more integrative research.

A second gap concerns the application of ambidexterity concepts in specific contexts. The emergence of amoeba management in the co-occurrence map suggests growing interest in decentralized structures associated with both exploration and exploitation. However, empirical evidence on how management control systems (MCS) operate within such flexible designs remains limited, particularly regarding coordination and learning in dynamic environments.

A third opportunity involves understanding how tensions between exploration and exploitation unfold across different organizational contexts. While the map links exploitation to performance and learning, and exploration to innovation, few studies analyze how these tensions are managed in resource-constrained settings such as SMEs, startups, or firms in emerging economies. Further research could examine how control practices are associated with ambidexterity under these conditions.

Figure 5 shows that Management Accounting Research occupies the central position in the citation network, indicating its role as the primary reference source in studies on ambidexterity, management control, and performance. Around this core, journals such as Accounting, Organizations and Society, Information Systems Research, Small Business Economics, and Journal of Management Control form secondary clusters that connect themes related to innovation, learning, and performance measurement. More peripheral journals, including Sustainability (Switzerland), Industrial Marketing Management, and IEEE Transactions on Engineering Management, contribute complementary but less interconnected perspectives. Overall, the map reveals a field structured around a central set of journals, supported by a diverse group of sources that expand the thematic and methodological scope of the literature.

Figure 5. Citation by sources

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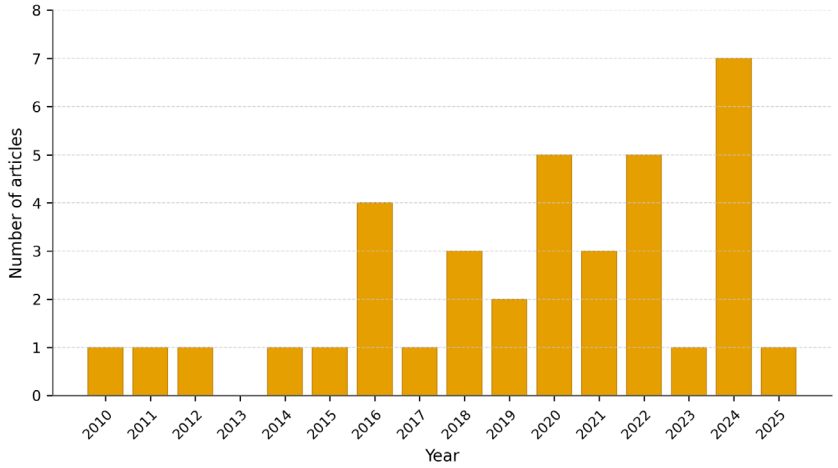
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Source: Prepared by the authors using VOSviewer.

Figure 6 shows that the number of publications remained low between 2010 and 2015, followed by an increase from 2016 onward. Publication activity reached five articles in both 2020 and 2022 and attained its highest level in 2024, with eight articles. The article assigned to a 2025 journal issue was first published online in 2024 and was therefore eligible under the temporal criterion adopted in the review. Overall, the distribution indicates increasing scholarly attention to the relationship between management control and organizational ambidexterity.

Figure 6. Articles published by year.



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Source: Prepared by the authors.

The analysis of citations by journal shows a strong concentration of citations in a few core outlets. Management Accounting Research is the most cited journal, with 940 citations, followed by R&D Management with 148 citations, Information Systems Research with 128 citations, Accounting, Organizations and Society with 118 citations, and Strategy Science with 110 citations. The remaining journals display a more dispersed pattern, with several appearing with only a few citations. This distribution indicates that although many journals contribute to the field, a small group of specialized outlets constitutes the main intellectual base for studies of management control, innovation, and organizational ambidexterity.

Table 1. Citations by journal.

Journal	**Citations**
Management Accounting Research	940
R&D Management	148
Information Systems Research	128
Accounting, Organizations and Society	118
Strategy Science	110
International Journal of Operations & Production Management	94
Small Business Economics	91
Journal of Business Ethics	83
Economic Research-Ekonomska Istraživanja	69
Sustainability (Switzerland)	60
Journal of Management Control	39
Business Process Management Journal	35
Journal of Information Systems	35
Frontiers in Psychology	30
International Review of Administrative Sciences	27
International Entrepreneurship and Management Journal	13
Journal of Applied Behavioral Science	13
Meditari Accountancy Research	13
International Journal of Productivity and Performance Management	12
Journal of Economic Interaction and Coordination	9
Journal of Accounting & Organizational Change	8
Schmalenbach Journal of Business Research	8
Public Management Review	7

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Industrial Marketing Management	5
International Journal of Ethics and Systems	4
Journal of Business & Industrial Marketing	3
IEEE Transactions on Engineering Management	2

Source: Prepared by the authors.

The citation analysis of the included studies shows that citations are concentrated in a relatively small number of publications. The study by Bedford has the highest citation count, followed by those authored by McCarthy and Gordon, Daowadueng et al., Bedford et al., and Ramesh et al. The remaining citations are distributed across a broader group of studies. This pattern indicates the concentration of bibliometric influence among a limited number of publications rather than among individual researchers.

Table 2. Citations of included studies by author(s)

Authors	Citations
Bedford, D. S.	234
McCarthy, I. P.; Gordon, B. R.	148
Daowadueng, P.; Hoozée, S.; Jorissen, A.; Maussen, S.	145
Wabnegg, M.	139
Bedford, D. S.; Bisbe, J.; Sweeney, B.	137
Ramesh, B.; Mohan, K.; Cao, L.	128
Antonini, C.; Gomez-Conde, J.	124
Ylinen, M.; Gullkvist, B.	114
Kreutzer, M.; Cardinal, L. B.; Walter, J.; Lechner, C.	110
Stouthuysen, K.; Slabbinck, H.; Roodhooft, F.	95
Malagueño, R.; López-Valeiras, E.; Gomez-Conde, J.	91
Hansen, E. G.; Schaltegger, S.	83
Badu, D. A.; Micheli, P.	76
Kruis, A. M.; Speklé, R. F.; Widener, S. K.	70
Wall, F.	69
Cardoni, A.; Zanin, F.; Corazza, G.; Paradisi, A.	60
Gschwantner, S.; Hiebl, M. R. W.	39
Lee, M. T.; Widener, S. K.	35
Severgnini, E.; Vieira, V. A.; Cardoza Galdamez, E. V.	35

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Authors	Citations
Umans, T.; Smith, E.; Andersson, W.; Planken, W.	27
Zhao, K.; Zong, B.; Zhang, L.	20
Mura, M.; Micheli, P.; Longo, M.	18
García-Hurtado, D.; Devece, C.; Zegarra-Saldaña, P. E.; Crisanto-Pantoja, M.	13
Nielsen, C.	13
Sugarman, B.	13
Adler, R.; Hiromoto, T.; Suzuki, H.	12
Leitner, S.; Wall, F.	9
Ahmed, F.; Soomro, S. A.; Tunio, F. H.; Ding, Y.; Qureshi, N. A.	8
Endenich, C.; Lachmann, M.; Schachel, H.; Zajkowska, J.	8
Möller, K.; Schmid, F.; Seehofer, T. M.; Wenig, P.	8
Evans, J. M.; Commisso, E.; Grudniewicz, A.; Im, J.; Veillard, J.; Richards, G.	7
Ahmad, B.; Yuan, J.; Ashfaq, M.; Shahzad, K.; Zhang, T.	5
Hadji, S.; Gholizadeh, P.; Naghavi, N.	4
Irfan, M.; Ahmad, B.	3
Cao, R.; Jiang, R.	2
Getele, G. K.; Ruoliu, X.	2

Source: Prepared by the authors

The SJR Quartile is a metric that ranks journals into quartiles of academic impact (Q1 to Q4) based on the number and relevance of citations. The analysis of the identified articles found that most were published in Q1 journals, such as Management Accounting Research and International Entrepreneurship and Management Journal. These journals contributed to studies on the relationship between management control systems (MCS), performance measurement systems (PMS), and organizational ambidexterity, providing data that support the conclusions of the systematic review.

These bibliometric patterns provide the basis for examining the thematic variations and relationships discussed in Sections 4.2 and 4.3, particularly the position of management control in the literature connecting innovation and efficiency across different organizational contexts.

4.2 Content analysis

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The detailed classification of the reviewed studies is presented in Appendix B. The studies were coded according to study type, methodology, level of analysis, analytical role of MCS, and conceptual or organizational function of MCS. The analytical role refers to the position occupied by MCS in the theoretical or empirical model, such as independent, mediating, moderating, dependent, or not formally specified. MCS were classified as moderating variables only when the original study explicitly theorized or empirically tested whether an MCS variable changed the strength or direction of a relationship between other variables, normally through an interaction effect. Organizational contexts, contingencies, and conditions that were not formally modeled in this manner were not classified as moderating variables. The conceptual or organizational function describes what MCS are understood to do in the study, such as providing information, coordinating activities, directing attention, supporting learning, or combining control practices. This distinction allows the synthesis to compare studies without treating organizational context or conceptual function as equivalent to a formally tested analytical role.

The structured classification reveals that the relationship between MCS and ambidexterity is examined through different analytical positions and at different levels of analysis. In quantitative empirical studies, MCS are predominantly modeled as independent variables, although some studies examine mediation, moderation, interaction effects, or indirect relationships. Individual-level studies emphasize attention, trust, motivation, and ambidextrous behavior, while team-level studies focus on leadership, cognitive conflict, coordination, and learning. Organizational-level studies examine control system design, combinations of control practices, innovation, and performance. Interorganizational studies emphasize the coordination of exploration and exploitation across alliances, networks, or organizational boundaries. These differences indicate that findings obtained at one level should not be treated as directly equivalent to findings produced at another level.

Performance measurement systems (PMS) can be considered part of the broader MCS. In this review, however, distinguishing the two concepts is analytically relevant because the studies examine them with different scopes and purposes. MCS encompasses a wide range of formal and informal control practices associated with organizational behavior. In contrast, PMS represents a specific subset focused on measurement structures and the monitoring and use of indicators in decision-making. Clarifying this conceptual distinction helps interpret the findings presented in sections 4.2 and 4.3, since

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several studies investigate PMS in isolation, while others analyze broader MCS configurations.

The thematic clusters identified in the bibliometric analysis directly inform the conceptual patterns observed in the reviewed studies. The cluster linking management control to performance systems reflects the predominance of research connecting diagnostic and interactive uses with exploitative and exploratory behaviors. In contrast, the innovation–ambidexterity cluster aligns with findings on the need to balance incremental and radical learning. In addition, contextual clusters highlight differences across R&D settings, SMEs, and entrepreneurial universities, which reappear in the synthesis as key contingencies associated with variations in how management practices are linked to ambidexterity.

Building on the discussion of MCS design and use, the relationship between the Levers of Control framework and ambidexterity can be examined through the associations of diagnostic and interactive controls with exploration and exploitation. Interactive controls are commonly associated with managerial attention to strategic uncertainties, dialogue, experimentation, and learning, whereas diagnostic controls are associated with performance monitoring and operational reliability. Studies examining their concurrent use report that different combinations of these controls are related to how organizations address the competing demands of exploration and exploitation (Simons, 1994; Bedford, 2015; Bisbe & Otley, 2004; Mura et al., 2021).

The analysis of the 37 relevant articles included in this systematic literature review highlights how MCS and PMS are associated with ambidextrous organizations in exploration and exploitation contexts. At the same time, the review reveals context-dependent variations in how these relationships are observed across studies. For example, the interactive use of control systems is associated with increased innovation in less innovative firms but may have neutral or even negative effects in highly innovative contexts (Bisbe & Otley, 2004). Similarly, the relationships involving combinations of diagnostic and interactive controls vary according to organizational characteristics such as task complexity and environmental uncertainty (Bedford, 2015; Kreutzer et al., 2016). In addition, differences in organizational settings, such as SMEs, R&D-intensive firms, and public-sector organizations, are associated with variations in how control practices are configured and their relationship to exploration and exploitation outcomes.

Differences emerge in how prior studies explain the relationships between MCS, exploration, and exploitation. Bedford (2015) associates combinations of diagnostic and

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interactive control uses with the balance between exploratory and exploitative activities. Bisbe and Otley (2004) report that the relationship between interactive control use and innovation varies according to prior innovation levels. McCarthy and Gordon (2011) propose that different control elements may be associated with exploration and exploitation under different contextual demands, while Kreutzer et al. (2016) identify complementary or substitutive relationships between formal and informal controls across task environments. These findings indicate context-dependent variation rather than a single relationship applicable across studies. The variations are also related to differences in the definition and operationalization of ambidexterity.

Methodological heterogeneity also contributes to variations in the relationships reported across studies. Several studies rely on cross-sectional survey designs (e.g., Bedford, 2015; Bisbe & Otley, 2004), which limit the ability to observe the temporal dynamics through which management control practices are associated with ambidexterity. Others employ distinct operationalizations of key constructs, such as diagnostic and interactive uses of PMS (Mura et al., 2021) or exploratory versus exploitative learning (Zhao et al., 2020), reducing comparability across empirical findings. The frequent reliance on perceptual measures and single respondents increases the risk of common method variance. At the same time, the limited use of longitudinal or mixed-methods approaches restricts the examination of temporal relationships, causal processes, and boundary conditions. These methodological limitations help explain why similar control practices are associated with different outcomes.

One of the main patterns observed concerns the relationships between combinations of control practices and ambidexterity. Bedford (2015) associates combinations of interactive and diagnostic uses with the balance between exploration and exploitation. McCarthy and Gordon (2011), in turn, propose that belief, boundary, diagnostic, and interactive systems may be associated with both activities under different contextual demands. This variation suggests that the relationships involving MCS configurations depend on organizational conditions rather than reflecting a universal configuration.

Another context-dependent variation concerns the use of performance measurement systems. Mura et al. (2021) report a positive association between the combined diagnostic and interactive uses of PMS and organizational ambidexterity. Bisbe and Otley (2004), however, find that the relationship between interactive use and innovation varies according to prior innovation levels. These findings suggest that the

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organizational innovation profile is a relevant boundary condition in the relationship between PMS use and ambidexterity.

A related source of variation concerns the organizational arrangements through which ambidexterity is pursued. Tushman and O'Reilly (1996) conceptualize structural ambidexterity through the separation of exploration and exploitation into distinct organizational units, whereas Gibson and Birkinshaw (2004) conceptualize contextual ambidexterity as individuals' capacity to pursue both activities within the same unit. Rather than representing contradictory perspectives, these approaches address different ways of organizing exploration and exploitation. Their applicability may vary according to organizational size, sector, structure, and culture.

The relationship between leadership and organizational ambidexterity is examined from different analytical perspectives. Zhao et al. (2020) associate the combination of power-sharing and leader control behaviors with exploratory and exploitative learning within teams. Wall (2020), using an agent-based simulation, shows that greater organizational complexity is associated in the model with increased hierarchical coordination and reduced flexibility for exploration. These findings were obtained at different levels of analysis and from different evidential bases and should therefore not be interpreted as directly contradictory.

Finally, institutional contingencies are associated with variations in ambidexterity outcomes. Antonini and Gomez-Conde (2024) find that regulatory-induced environmental MCS are related to exploratory environmental innovation differently from internally initiated systems. Their longitudinal evidence indicates an initially negative relationship that becomes positive over time as firms adapt their control routines. This temporal variation suggests that the relationship between environmental MCS and exploration depends on institutional pressures and organizational adaptation.

These context-dependent variations illustrate the multifaceted relationship between management control practices and organizational ambidexterity and identify questions for future research. Further studies may examine how contextual, temporal, and sectoral conditions are associated with variations in the relationships between management control practices, exploration, and exploitation.

4.2.1 TCCM analysis - Theories, Contexts, Characteristics, and Methodology

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The TCCM analysis of the thirty-seven studies included in this review, systematized in Appendix B, indicates that the literature on ambidexterity and management control practices is anchored in a set of consolidated theoretical frameworks, particularly the Levers of Control (Simons, 1994) and related conceptualizations of MCS and performance measurement systems. Across the studies, these frameworks are used to examine how diagnostic, interactive, formal, informal, organic, and mechanistic controls are associated with exploration and exploitation in different organizational settings.

The empirical contexts covered in the reviewed articles include R&D-intensive firms, SMEs, entrepreneurial universities, interorganizational networks, sales teams, public-sector entities, and organizations operating in emerging economies. This diversity indicates that the relationship between control practices and ambidexterity unfolds under heterogeneous institutional, technological, and resource conditions.

Regarding the characteristics examined, most studies focus on organizational ambidexterity, followed by contextual, team, and individual-level ambidexterity. The analyses emphasize relationships connecting PMS and broader MCS with innovation, learning, and performance, including the roles of leadership, information availability, cognitive conflict, and control system design.

Methodologically, the reviewed evidence includes quantitative surveys, qualitative case studies, conceptual studies, literature reviews, and computational simulations. These forms of evidence make different contributions to the synthesis. Quantitative studies provide evidence of statistical associations among specified constructs, although their predominantly cross-sectional designs limit causal and temporal inference. Qualitative studies provide contextualized explanations of how control practices are interpreted and combined in organizational settings. Conceptual studies and literature reviews develop propositions and classifications but do not provide direct empirical tests. Computational simulations examine relationships under explicitly defined assumptions and should therefore be interpreted as model-based results rather than observed organizational effects. Accordingly, the synthesis interprets the findings in relation to the characteristics and inferential capacity of each research design. This approach allows empirical associations, qualitative interpretations, conceptual propositions, review-based conclusions, and simulation-based results to be differentiated rather than treated as equivalent forms of evidence.

Given the heterogeneity of the included studies, which comprised quantitative and qualitative empirical research, conceptual studies, literature reviews, and computational

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simulations, evidential strength was assessed according to study design rather than through a single standardized quality score. The synthesis therefore distinguished statistical associations, context-specific qualitative findings, conceptual propositions, review-based conclusions, and model-based simulation results when interpreting and comparing the evidence. A common appraisal instrument was not used because no single set of criteria was considered equally applicable across these different forms of evidence. Although this design-sensitive approach allowed different forms of evidence to be examined, the absence of a formal methodological quality appraisal constitutes a limitation of the review.

4.2.2 Management Control Systems and Organizational Ambidexterity

The analysis of the thirty-seven articles indicates that MCS are associated with organizational ambidexterity through three recurring conceptual or organizational functions: providing information, coordinating exploration and exploitation, and informing strategic decision-making. These functions describe how MCS are positioned in the reviewed literature and should not be interpreted as causal effects established across the complete body of evidence.

The provision of information is one of the recurring functions attributed to MCS in the reviewed literature. Costing system design choices have been associated with exploratory activities and strategic resource allocation in innovation-oriented environments (Daowadueng et al., 2023). Balanced Scorecard architectures have been examined in relation to the integration of exploratory and exploitative objectives (Nielsen, 2019), while diagnostic PMS are associated with the monitoring and adjustment of strategic goals (Cardoni et al., 2020). In entrepreneurial universities, PMS are discussed in relation to coordinating academic exploration and administrative exploitation (García-Hurtado et al., 2024). Organic controls are associated with exploratory initiatives, whereas mechanistic controls are associated with exploitative innovation (Ylinen & Gullkvist, 2014). At the individual and team level, performance measures are associated with exploratory and exploitative behaviors in R&D settings (Wabnegg, 2024).

Researchers have also examined the balance between exploration and exploitation through combinations of control practices. Diagnostic and interactive uses are analyzed as interdependent or complementary elements associated with organizational ambidexterity (Bedford, 2015; Mura et al., 2021). Bedford et al. (2019) further show that balanced performance measures and their intensive use for managerial debate operate

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jointly by generating cognitive conflict. Interactive controls relate to dialogue, learning, and processing uncertainty, whereas diagnostic controls relate to performance monitoring and stability. Formal and informal controls may be complementary or substitutive depending on the task environment (Kreutzer et al., 2016). Similar relationships are discussed in R&D organizations (McCarthy & Gordon, 2011), distributed teams (Ramesh et al., 2012), and interorganizational healthcare networks (Evans et al., 2024). These studies differ in design and level of analysis and therefore provide distinct forms of evidence about control configurations.

Strategic decision-making is another function associated with control practices in the reviewed literature. Belief and boundary systems are discussed in relation to the articulation of organizational values and the definition of limits for experimentation (Adler et al., 2020). Agent-based evidence associates information-rich environments with more adaptive decisions under the assumptions specified in the simulation model (Leitner & Wall, 2021). Antonini and Gomez-Conde (2024) identify a time-varying relationship between regulatory-induced environmental MCS and exploratory environmental innovation. MCS design is also associated with different forms of innovation in startups (Endenich et al., 2023), while business intelligence systems are associated with exploratory and exploitative learning (Lee & Widener, 2016).

Across the reviewed studies, MCS are associated with alignment, adaptability, information provision, and iterative adjustment in dynamic environments. These relationships vary in resource-constrained settings such as SMEs and emerging economies (Getele & Ruoliu, 2024). Overall, the literature assigns MCS different informational, behavioral, and coordinating functions in relation to exploration and exploitation at the organizational, team, individual, and interorganizational levels. These recurring functions, together with the contextual conditions identified across studies, underpin the integrative framework developed in Section 4.3.

4.3 Integration of Findings and Rationale for the Proposed Framework

Integrating findings across the reviewed studies reveals three consistent patterns that underpin the proposed framework presented in Figure 7. Derived from comparisons of the analytical roles and conceptual or organizational functions coded in Appendix B across study types, levels of analysis, and organizational contexts, these patterns explain how MCS are associated with managing tensions between exploration and exploitation.

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First, information provision is a recurring function attributed to MCS in environments where exploratory and exploitative activities coexist. Evidence from costing systems (Daowadueng et al., 2023), performance measurement systems (Nielsen, 2019), and continuous feedback practices (Evans et al., 2024) links timely, detailed information to decision-making under competing demands. Findings from the agent-based simulation by Leitner and Wall (2021) indicate that, under the model's assumptions, decision-facilitating information is associated with greater adaptability in complex settings. Together, these studies link information structures to exploratory learning and operational efficiency, though they provide different types of evidence.

Second, a recurring pattern relates to the combined use of diagnostic and interactive control elements. Diagnostic controls are associated with monitoring exploitative activities, while interactive controls are associated with dialogue and responsiveness to strategic uncertainty. Studies such as Bedford (2015), Mura et al. (2021), McCarthy and Gordon (2011), Kreutzer et al. (2016), and Ylinen and Gullkvist (2014) show that ambidexterity is associated with the interplay of these elements rather than isolated uses. Complementarity is also evident in the joint effects of balanced PMS design and intensive managerial debate identified by Bedford et al. (2019). This duality also appears in R&D contexts, where performance measures are associated with exploratory and exploitative behavior (Wabnegg, 2024). The emphasis on hybrid configurations aligns with the bibliometric clusters identified in Section 4.1, indicating convergence around integrated control practices.

Third, the association between management control practices and ambidexterity varies across organizational contexts. Studies conducted in entrepreneurial universities, R&D-intensive firms, SMEs, public-sector organizations, interorganizational networks, and startups report different control configurations and relationships with exploration and exploitation (García-Hurtado et al., 2024; Getele & Ruoliu, 2024; McCarthy & Gordon, 2011; Evans et al., 2024; Endenich et al., 2023). Antonini and Gomez-Conde (2024) further identify temporal variation in the relationship between institutional pressures, environmental MCS, and exploratory environmental innovation. These findings position organizational context and time as boundary conditions in the relationships synthesized in the framework.

Based on these patterns, Figure 7 synthesizes the relationships identified in the analysis by integrating information provision, diagnostic and interactive uses of control elements, and contextual factors into a unified framework linking MCS to organizational

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ambidexterity. The framework distinguishes between control elements, contextual factors, and organizational outcomes or relationships, reflecting how prior studies conceptualize the role of MCS across different analytical positions.

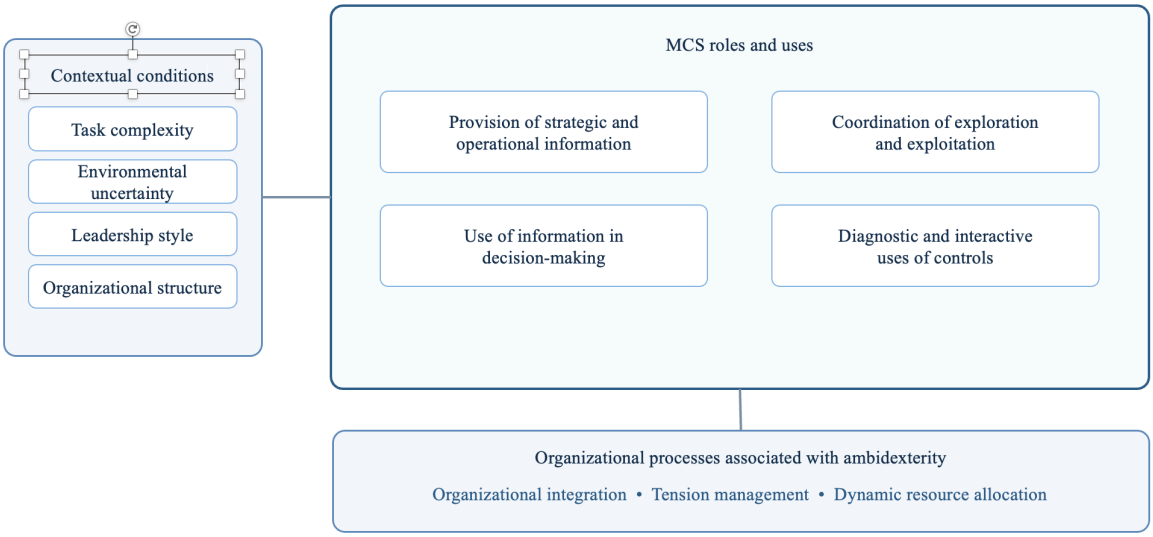
The review also highlights the role of PMS. Combined diagnostic and interactive uses are associated with a dynamic tension, as discussed in Section 4.2 (Mura et al., 2021; Severgnini et al., 2018). The relationships involving PMS vary according to their alignment with strategic objectives and contextual conditions, as suggested in studies examining the interaction of formal and informal controls (McCarthy & Gordon, 2011) and the differentiated effects of outcome-based and behavior-based controls (Irfan & Ahmad, 2024). Research also indicates that interactive PMS use is associated with radical innovation, while diagnostic use is associated with operational efficiency (Badu & Micheli, 2025).

In summary, the integrated findings associate MCS with organizational integration and decision-making in environments characterized by competing demands. In particular, the diagnostic and interactive uses of control systems emerge as key elements linking exploration and exploitation. Their relationships with ambidextrous outcomes vary according to contextual conditions, including environmental uncertainty and task complexity. The literature also connects MCS with integration, tension management, and resource allocation, although the strength and nature of this evidence differ across study designs and levels of analysis. These findings address the central research question and provide the conceptual basis for the framework presented in Figure 7.

Figure 7. *Integrative framework of the relationships between MCS and organizational ambidexteri*ty.

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Source: Prepared by the authors based on the findings of the systematic review.

4.4 Future Research Directions

First, future research should examine how configurations of management control practices relate to ambidexterity across different organizational contexts. The reviewed studies indicate that diagnostic, interactive, formal, informal, organic, and mechanistic controls are rarely used in isolation, but evidence remains fragmented regarding which configurations are associated with exploration and exploitation under specific organizational conditions (Bedford, 2015; Getele & Ruoliu, 2024; Möller et al., 2022). Comparative studies could examine how firm size, resource availability, innovation intensity, task complexity, and environmental uncertainty shape these configurations. Longitudinal and multi-context research designs could also help determine whether control configurations remain stable or adjust as organizations move between periods of exploration and exploitation. This direction raises the following question: Which configurations of management control practices are associated with organizational ambidexterity under different contextual conditions?

Second, future studies should examine the processes and analytical pathways through which management control practices relate to exploration and exploitation. Appendix B shows that MCS have been examined as independent, mediating, and moderating variables, but these analytical roles remain unevenly represented across the literature. Existing studies associate MCS with information provision, cognitive conflict, learning, leadership behavior, and strategic decision-making at organizational, team, and individual levels (Severgnini et al., 2018; Zhao et al., 2020; Mura et al., 2021; Wabnegg, 2024). Future research could test whether these factors operate as mediators, moderators,

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or contextual conditions rather than treating them as equivalent explanatory mechanisms. Multilevel, longitudinal, experimental, and mixed-method designs could clarify the temporal ordering of these relationships and connect individual and team responses to organizational ambidextrous outcomes. This direction raises the following question: Through which cross-level processes and analytical pathways are management control practices associated with exploration and exploitation?

Third, further research is needed in interorganizational, networked, and geographically distributed settings. Most of the reviewed evidence focuses on individual firms, whereas fewer studies examine how control practices operate across organizational boundaries. Studies of alliances, distributed development teams, and healthcare networks indicate that formal controls, shared goals, performance information, trust, and collaboration may interact differently when authority and decision-making are dispersed across organizations or locations (Kreutzer et al., 2016; Ramesh et al., 2012; Evans et al., 2024). Future studies could examine how control responsibilities are distributed among partners, how performance information is shared, and how tensions between local autonomy and collective coordination affect exploration and exploitation. Research using network-level data, multiple respondents, comparative case studies, and longitudinal designs would extend the predominantly firm-level evidence. This direction raises the following question: How are management control practices associated with ambidexterity when exploration and exploitation are distributed across organizational and geographical boundaries?

Together, these directions outline a research agenda grounded in the patterns identified in this review and reflected in the structured classification presented in Appendix B. They extend the existing literature by connecting control configurations, analytical pathways, levels of analysis, organizational contexts, and research designs, providing a basis for investigating how management control practices are associated with organizational ambidexterity.

5. **Conclusion**

This review concludes that management control systems (MCS), including performance measurement systems (PMS), are associated with how organizations balance exploration and exploitation in ambidextrous contexts. Their role is reflected in providing decision-relevant information, coordinating strategic activities, and supporting adaptive learning processes. The literature consistently shows a pattern of using diagnostic controls

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for efficiency and interactive controls for innovation, reflecting how organizations maintain operational stability while responding to strategic uncertainty.

The findings clarify how different control uses and configurations relate to exploration and exploitation. Diagnostic uses of PMS are generally associated with exploitation-oriented activities, whereas interactive uses are associated with exploratory learning and opportunity identification. Distinguishing between these uses helps explain how organizations combine routine reinforcement with adaptive learning across varied contexts. Empirical evidence also indicates that costing systems, Balanced Scorecard architectures, and feedback loops are associated with connecting short-term efficiency with longer-term innovation.

However, the relationships between MCS and ambidexterity vary by context. Firm size, innovation intensity, resource availability, and organizational context are associated with differences in how diagnostic and interactive uses are combined. SMEs and emerging-economy settings are described as relying more heavily on diagnostic controls under resource constraints, while organizations with greater slack exhibit more flexible configurations associated with exploration (Getele & Ruoliu, 2024; García-Hurtado et al., 2024). The relationship between interactive use and exploration also varies according to prior innovation levels (Bisbe & Otley, 2004; Ylinen & Gullkvist, 2014). Institutional and cultural conditions also shape how formal controls are interpreted and enacted (McCarthy & Gordon, 2011). These findings indicate that the relationship between MCS and ambidexterity varies according to structural, cultural, and strategic characteristics.

Tools such as the Balanced Scorecard are discussed as integrators of temporal and strategic priorities and are associated with the alignment of short- and long-term objectives (Hansen & Schaltegger, 2018; Malagueño et al., 2018; Nielsen, 2019). Their multi-perspective structure connects operational efficiency and strategic renewal, making these systems relevant to discussions of temporal ambidexterity. The reviewed evidence also indicates that formal controls, when combined with informal elements such as shared norms, trust, and leadership behaviors, are associated with ambidextrous outcomes across teams, alliances, and interorganizational settings (Kreutzer et al., 2016; Ramesh et al., 2012; Evans et al., 2024).

Overall, this review consolidates fragmented evidence and proposes an integrated framework that synthesizes how MCS are associated with organizational ambidexterity through multiple elements and under different contextual conditions. The synthesis therefore shifts the discussion from identifying individual controls associated with

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ambidexterity to examining how control configurations and contextual conditions relate to variations in the simultaneous pursuit of exploration and exploitation. The observed relationships depend on their alignment with organizational specificities and on how informational and behavioral elements are combined in practice. The research directions developed in Section 4.4 translate the gaps identified in the review into questions concerning control configurations, cross-level processes, contextual conditions, and interorganizational forms of ambidexterity.

Declaração de conflito de interesse
Os autores declaram que não há conflito de interesse.

Declaração de contribuição dos autores
Cristiane Lana Silva
conceitualização (líder), curadoria de dados (líder), análise formal (líder), metodologia (líder), administração do projeto (líder), supervisão (líder), validação (igual), redação – rascunho original (líder), redação – revisão e edição (igual).

Alceu Salles Camargo Junior
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Declaração de disponibilidade de dados da pesquisa
O conjunto de dados de apoio aos resultados deste estudo não está disponível ao público.

Declaração de uso de IA
A ferramenta de inteligência artificial ChatGPT foi utilizada para auxiliar na revisão técnico-gramatical do texto e normalização de referências.

Financiamento
O presente trabalho foi realizado com apoio parcial da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Código Financeiro 001, e com apoio do PROEX/AUXPE nº 23038.011259/2021-97.

References:

SciELO Preprints - https://doi.org/10.1590/1982-7849rac2027250290.en

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Adler, R., Hiromoto, T., & Suzuki, H. (2020). Amoeba management and organizational ambidexterity: Similarities, differences, and implications for organizational fit and success. *International Journal of Productivity and Performance Management, 69(2), 405–427*. https://doi.org/10.1108/ijppm-07-2018-0254

Ahmad, B., Yuan, J. B., Ashfaq, M., Shahzad, K., & Zhang, T. Y. (2024). Does salesperson bricolage matter in fostering service-sales ambidexterity in B2B markets? A perspective through the sales management control system. *Industrial Marketing Management,* 108, 294–307. https://doi.org/10.1016/j.indmarman.2024.07.011

Ahmed, F., Soomro, S. A., Tunio, F. H., Ding, Y., & Qureshi, N. A. (2022). Performance monitoring, subordinate's felt trust and ambidextrous behavior: Toward a conceptual research framework. Frontiers in Psychology, 13, Article 758123. https://doi.org/10.3389/fpsyg.2022.758123

AlKhamees, S. B., & Durugbo, C. M. (2025). Organizational ambidexterity and innovation: a systematic review and unified model of 'CODEC' management priorities. Management Review Quarterly, 75(4), 3813–3887. https://doi.org/10.1007/s11301-024-00474-5

Anthony, R. N. (1965). *Planning and control systems: A framework for analysis*. Harvard Business School Press.

Antonini, C., & Gomez-Conde, J. (2024). Environmental management control systems and environmental innovation: Unintended consequences of the EU non-financial reporting directive. Management Accounting Research, 65, 100903. https://doi.org/10.1016/j.mar.2024.100903

Badu, D. A., & Micheli, P. (2025). How performance measurement systems enable or hinder organizational ambidexterity. International Journal of Operations & Production Management, 45(1), 185–209. https://doi.org/10.1108/IJOPM-07-2023-0591

Balboni, B., Bortoluzzi, G., Pugliese, R., & Tracogna, A. (2019). Business model evolution, contextual ambidexterity and the growth performance of high-tech start-ups. Journal of Business Research, 99, 115–124. https://doi.org/10.1016/j.jbusres.2019.02.029

Bedford, D. S. (2015). Management control systems across different modes of innovation: Implications for firm performance. *Management Accounting Research*, 28, 12–30. https://doi.org/10.1016/j.mar.2015.04.003

Bedford, D. S., & Malmi, T. (2015). Configurations of control: An exploratory analysis. Management Accounting Research, 27, 2–26. https://doi.org/10.1016/j.mar.2015.04.002

Bedford, D. S., Bisbe, J., & Sweeney, B. (2019). Performance measurement systems as generators of cognitive conflict in ambidextrous firms. *Accounting, Organizations and Society,* 72, 21-37. https://doi.org/10.1016/j.aos.2018.05.010

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Bedford, D. S., Bisbe, J., & Sweeney, B. (2022). The joint effects of performance measurement system design and TMT cognitive conflict on innovation ambidexterity. Management Accounting Research, 57, Article 100805. https://doi.org/10.1016/j.mar.2022.100805

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review*, 28(2), 238–256. https://doi.org/10.2307/30040711

Birkinshaw, J., & Gupta, K. (2013). Clarifying the distinctive contribution of ambidexterity to the field of organization studies. *Academy of Management Perspectives*, 27(4), 287–298. https://doi.org/10.5465/amp.2012.0167

Bisbe, J., & Otley, D. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, Organizations and Society, 29*(8), 709–737. https://doi.org/10.1016/j.aos.2003.10.010

Burkert, M., & Grossrieder, S. (2025). Individual ambidexterity and management controls: a systematic literature review. Management Review Quarterly, 1–58. https://doi.org/10.1007/s11301-025-00493-w

Cao, Q., Gedajlovic, E., & Zhang, H. (2009). Unpacking organizational ambidexterity: Dimensions, contingencies, and synergistic effects. *Organization Science*, 20(4), 781–796. https://doi.org/10.1287/orsc.1090.0426

Cao, R., & Jiang, R. (2022). Resolving strategic dilemmas in ambidextrous organizations: An integrated second-order factor model perspective. *Frontiers in Psychology*, 13, 797645. https://doi.org/10.3389/fpsyg.2022.797645

Cardoni, A., Zanin, F., Corazza, G., & Paradisi, A. (2020). Knowledge management and performance measurement systems for SMEs' economic sustainability. Sustainability, 12(7), 2594. https://doi.org/10.3390/su12072594

Centobelli, P., Cerchione, R., & Esposito, E. (2019). Exploration and exploitation in the development of more entrepreneurial universities: A twisting learning path model of ambidexterity. *Technological Forecasting and Social Change*, 141, 172–194. https://doi.org/10.1016/j.techfore.2018.10.014

Chang, Y. C. (2016). Entrepreneurial universities and research ambidexterity: A multilevel analysis. *Technovation,* 54, 7–21. https://doi.org/10.1016/j.technovation.2016.02.006

Chenhall, R. H. (2003). Management control systems design within its organizational context. Accounting, Organizations and Society, 28(2–3), 127–168. https://doi.org/10.1016/S0361-3682(01)00027-7

Chenhall, R. H., & Euske, K. J. (2007). The role of management control systems in planned organizational change: An analysis of two organizations. *Accounting, Organizations and Society, 32*(7–8), 601–637. https://doi.org/10.1016/j.aos.2006.09.007

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Chimenti, P. (2025). Beyond bibliometrics: The value of literature reviews in management research. Revista de Administração Contemporânea, 29(3), e250209. https://doi.org/10.1590/1982-7849rac2025250209.en

Daowadueng, P., Hoozée, S., Jorissen, A., & Maussen, S. (2023). Do costing system design choices mediate the link between strategic orientation and cost information usage for decision-making and control? *Management Accounting Research*, 61, 100854. https://doi.org/10.1016/j.mar.2023.100854

Davila, A., Foster, G., & Li, M. (2009). Reasons for management control systems adoption: Insights from product development systems choice by early-stage entrepreneurial companies. *Accounting, Organizations and Society, 34*(3–4), 322–347. https://doi.org/10.1016/j.aos.2008.08.002

De Clercq, D., Thongpapanl, N., & Dimov, D. (2014). Contextual ambidexterity in SMEs: The roles of internal and external rivalry. Small Business Economics, 42(1), 191–205. https://doi.org/10.1007/s11187-013-9471-2

Duncan, R. B. (1976). The ambidextrous organization: Designing dual structures for innovation. *The Management of Organization*, 1, 167-188.

Endenich, C., Lachmann, M., Schachel, H., & Zajkowska, J. (2023). The relationship between management control systems and innovativeness in start-ups: evidence for product, business model, and ambidextrous innovation. *Journal of Accounting and Organizational Change*, 19(5), 706–734. https://doi.org/10.1108/jaoc-06-2022-0087

Evans, J. M., Commisso, E., Grudniewicz, A., Im, J., Veillard, J., & Richards, G. (2024). Managing the performance of healthcare networks: A "dance" between control and collaboration. Public Management Review, 26(7), 2144–2168. https://doi.org/10.1080/14719037.2023.2264873

García-Hurtado, D., Devece, C., Zegarra-Saldaña, P. E., & Crisanto-Pantoja, M. (2024). Ambidexterity in entrepreneurial universities and performance measurement systems. A literature review. *International Entrepreneurship and Management Journal*, 20(1), 345–366. https://doi.org/10.1007/s11365-022-00795-5

Getele, G. K., & Ruoliu, X. (2024). The key impact of management modes for innovation in SMEs. *IEEE Transactions on Engineering Management*, 71, 1877-1890. https://doi.org/10.1109/tem.2022.3164973

Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal*, *47*(2), 209–226. https://doi.org/10.2307/20159573

Gschwantner, S., & Hiebl, M. R. W. (2016). *Management control systems and organizational ambidexterity. Journal of Management Control*, 27(4), 371–404. https://doi.org/10.1007/s00187-016-0236-3

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Hadji, S., Gholizadeh, P., & Naghavi, N. (2022). Diagnosing of human resource performance management based on lack of ambidextrous learning themes: A case study of public Iranian banking system. International Journal of Ethics and Systems, 38(3), 484–509. https://doi.org/10.1108/IJOES-05-2021-0101

Hall, M. (2010). Accounting information and managerial work. Accounting, Organizations and Society, 35(3), 301–315. https://doi.org/10.1016/j.aos.2009.09.003

Hansen, E. G., & Schaltegger, S. (2018). Sustainability balanced scorecards and their architectures: Irrelevant or misunderstood? Journal of Business Ethics, 150, 937–952. https://doi.org/10.1007/s10551-017-3531-5

Henri, J.-F. (2006). Organizational culture and performance measurement systems. *Accounting, Organizations and Society*, 31(1), 77–103. https://doi.org/10.1016/j.aos.2004.10.003

Inamori, K. (2013). *Amoeba Management: The Dynamic Management System for Rapid Market Response*. Boca Raton, FL: CRC Press, Taylor & Francis Group. ISBN 978-1-4665-0949-8.

Irfan, M., & Ahmad, B. (2024). Modeling the influence of management control system and ambidextrous behavior on B2B customer relationships: A job demand-resource perspective. Journal of Business & Industrial Marketing, 39(4), 781–793. https://doi.org/10.1108/JBIM-08-2022-0389

Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. Management Science, 52(11), 1661–1674. https://doi.org/10.1287/mnsc.1060.0576

Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. Academy of Management Perspectives, 27(4), 299–312. https://doi.org/10.5465/amp.2012.0015

Kreutzer, M., Cardinal, L. B., Walter, J., & Lechner, C. (2016). Formal and informal control as complement or substitute? The role of the task environment. Strategy Science, 1(4), 235–255. https://doi.org/10.1287/stsc.2016.0019

Kruis, A. M., Speklé, R. F., & Widener, S. K. (2016). The levers of control framework: An exploratory analysis of balance. *Management Accounting Research, 32*, 27–44. https://doi.org/10.1016/j.mar.2015.12.002

Kumar, A., Paul, J., & Unnithan, A. (2019). Masstige marketing: A review synthesis and research agenda. *Journal of Business Research, 113*, 384–398. https://doi.org/10.1016/j.jbusres.2019.09.030

Laverty, K. J. (1996). Economic "short-termism": The debate, the unresolved issues, and the implications for management practice and research. Academy of Management Review, 21(3), 825–860. https://doi.org/10.5465/amr.1996.9702100316

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Lavie, D., Stettner, U., & Tushman, M. L. (2010). Exploration and exploitation within and across organizations. *Academy of Management Annals*, *4*(1), 109–155. https://doi.org/10.5465/19416521003691287

Leal, C. C., & Chimenti, P. (2026). What makes a systematic literature review worth publishing? Protocol, transparency, and critical synthesis in the age of artificial intelligence. Revista de Administração Contemporânea, 30(2), e260192. https://doi.org/10.1590/1982-7849rac2026260192.en

Leitner, S., & Wall, F. (2021). Decision-facilitating information in hidden-action setups: An agent-based approach. Journal of Economic Interaction and Coordination, 16(2), 323–358. https://doi.org/10.1007/s11403-020-00297-z

Lee, M. T., & Widener, S. K. (2016). The performance effects of using business intelligence systems for exploitation and exploration learning. *Journal of Management Accounting Research*, 30(3), 1–31. https://doi.org/10.2308/isys-51298

Lee, K., Woo, H. G., Park, T., & de Jong, S. (2023). Managers' pursuit of ambidexterity in the context of artificial intelligence implementations: Insights into situationally induced regulatory focus. International Journal of Innovation Management, 27(9–10), Article 2350051. https://doi.org/10.1142/S1363919623500512

Lin, H. E., & McDonough III, E. F. (2011). Investigating the role of leadership and organizational culture in fostering innovation ambidexterity. *IEEE Transactions on* Engineering Management, 58(3), 497–509. https://doi.org/10.1109/TEM.2010.2092781

Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small- to medium-sized firms: The pivotal role of top management team behavioral integration. Journal of Management, 32(5), 646–672. https://doi.org/10.1177/0149206306290712

Malagueño, R., Lopez-Valeiras, E., & Gomez-Conde, J. (2018). Balanced scorecard in SMEs: Effects on innovation and financial performance. Small Business Economics, 51, 221–244. https://doi.org/10.1007/s11187-017-9921-3

Malmi, T., & Brown, D. A. (2008). Management control systems as a package. Opportunities, challenges and research directions. Management Accounting Research, 19(4), 287–300. https://doi.org/10.1016/j.mar.2008.09.003

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*(1), 71-87. https://doi.org/10.1287/orsc.2.1.71

Marín-Idárraga, D. A., Hurtado Gonzalez, J. M., & Cabello Medina, C. (2022). Factors affecting the effect of exploitation and exploration on performance: A meta-analysis. BRQ Business Research Quarterly, 25(4), 312–336. https://doi.org/10.1177/2340944420972707

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Martyn, P., Sweeney, B., & Curtis, E. (2016). Strategy and control: 25 years of empirical use of Simons' Levers of Control framework. *Journal of Accounting & Organizational Change, 12*(3), 281–324. https://doi.org/10.1108/jaoc-03-2015-0027

Massaro, M., Dumay, J., & Guthrie, J. (2016). On the shoulders of giants: undertaking a structured literature review in accounting. Accounting, Auditing & Accountability Journal, 29(5), 767–801. https://doi.org/10.1108/AAAJ-01-2015-1939

Merchant, K. A., & Van der Stede, W. A. (2017). Management control systems: Performance measurement, evaluation and incentives (4th ed.). Pearson.

McCarthy, I. P., & Gordon, B. R. (2011). Achieving contextual ambidexterity in R&D organizations: A management control system approach. *R&D Management*, *41*(3), 240–258. https://doi.org/10.1111/j.1467-9310.2011.00642.x

Merchant, K. A., & Otley, D. T. (2020). Beyond the systems versus package debate. *Accounting, Organizations and Society, 86*, 101185. https://doi.org/10.1016/j.aos.2020.101185

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. PLoS Medicine, 6(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Möller, K., Schmid, F., Seehofer, T. M., & Wenig, P. (2022). How the design of an organizational context helps to attain contextual ambidexterity. Schmalenbach Journal of Business Research, 74(4), 603–629. https://doi.org/10.1007/s41471-022-00142-y

Mundy, J. (2010). Creating dynamic tensions through a balanced use of management control systems. *Accounting, Organizations and Society, 35*(5), 499–523. https://doi.org/10.1016/j.aos.2009.10.005

Mura, M., Micheli, P., & Longo, M. (2021). The effects of performance measurement system use on organizational ambidexterity and firm performance. International *Journal of Operations & Production Management*, 41(13), 127–151. https://doi.org/10.1108/ijopm-02-2021-0101

Nielsen, C. (2019). From innovation performance to business performance: Conceptualising a framework and research agenda. *Meditari Accountancy Research*, 27(1), 2–16. https://doi.org/10.1108/medar-03-2018-0318

O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior*, *28*, 185–206. https://doi.org/10.1016/j.riob.2008.06.002

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *Academy of Management Perspectives*, 27(4), 324–338. https://doi.org/10.5465/amp.2013.0025

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Popadiuk, S., & Luz, A. R. S. (2018). Dynamic capabilities and ambidexterity: How are these concepts related? *Journal of Contemporary Administration*, *22*(5), 639–660. https://doi.org/10.1590/1982-7849rac2018180135

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management*, 34(3), 375–409. https://doi.org/10.1177/0149206308316058

Ramesh, B., Mohan, K., & Cao, L. (2012). Ambidexterity in agile distributed development: An empirical investigation. Information Systems Research, 23(2), 323–339. https://doi.org/10.1287/isre.1110.0351

Saleh, R. H., Durugbo, C. M., & Almahamid, S. M. (2023). What makes innovation ambidexterity manageable: a systematic review, multi-level model and future challenges. Review of Managerial Science, 17(8), 3013–3056. https://doi.org/10.1007/s11846-023-00659-4

Severgnini, E., Vieira, V. A., & Cardoza Galdamez, E. V. (2018). The indirect effects of performance measurement system and organizational ambidexterity on performance. Business Process Management Journal, 24(5), 1176–1199. https://doi.org/10.1108/BPMJ-06-2017-0159

Simons, R. (1994). *Levers of control: How managers use innovative control systems to drive strategic renewal*. Harvard Business School Press.

Simons, R. (2014). *Performance measurement and control systems for implementing strategy*. Prentice Hall.

Simsek, Z. (2009). Organizational ambidexterity: Towards a multilevel understanding. *Journal of Management Studies, 46*(4), 597–624. https://doi.org/10.1111/j.1467-6486.2009.00828.x

Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. Academy of Management Review, 36(2), 381–403. https://doi.org/10.5465/amr.2009.0223

Stouthuysen, K., Slabbinck, H., & Roodhooft, F. (2017). Formal controls and alliance performance: The effects of alliance motivation and informal controls. Management Accounting Research, 37, 49–63. https://doi.org/10.1016/j.mar.2017.03.002

Sugarman, B. (2010). Organizational learning and reform at the New York City Police Department. The Journal of Applied Behavioral Science, 46(2), 157–185. https://doi.org/10.1177/0021886310369088

Suzuki, O., & Methé, D. (2011). Optimal ambidexterity and exploration valuableness: Balancing short-term and long-term trade-off in pharmaceutical products development. Journal of Business Chemistry, 8(2), 49–63.

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/1982-7849rac2027250290.en

Tessier, S., & Otley, D. (2012). A conceptual development of Simons' Levers of Control framework. *Management Accounting Research, 23*(3), 171–185. https://doi.org/10.1016/j.mar.2012.04.003

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management,* 14(3), 207–222. https://doi.org/10.1111/1467-8551.00375

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8-30. https://doi.org/10.2307/41165852

Umans, T., Smith, E., Andersson, W., & Planken, W. (2020). Top management teams' shared leadership and ambidexterity: The role of management control systems. International *Review of Administrative Sciences*, 86(3), 444-462. https://doi.org/10.1177/0020852318783539

Van de Wetering, R. (2022). The impact of artificial intelligence ambidexterity and strategic flexibility on operational ambidexterity. Asia Conference on Information Systems.

Wabnegg, M. (2024). Fostering ambidexterity among R&D employees: The dilemma of performance measures and how to overcome it. Management Accounting Research, 65, 100891. https://doi.org/10.1016/j.mar.2024.100891

Wall, F. (2020). Adaptation of the boundary system in growing firms: An agent-based computational study on the role of complexity and search strategy. Economic Research-Ekonomska Istraživanja, 33(1), 2881–2903. https://doi.org/10.1080/1331677X.2019.1679215

Wang, S. L., Luo, Y., Maksimov, V., Sun, J., & Celly, N. (2019). Achieving temporal ambidexterity in new ventures. *Journal of Management Studies, 56*(4), 788–821. https://doi.org/10.1111/joms.12431

Widener, S. K. (2007). An empirical analysis of the levers of control framework. *Accounting, Organizations and Society, 32*(7–8), 757–788. https://doi.org/10.1016/j.aos.2007.01.001

Ylinen, M., & Gullkvist, B. (2014). The effects of organic and mechanistic control in exploratory and exploitative innovations. *Management Accounting Research*, *25*(1), 93-112. https://doi.org/10.1016/j.mar.2013.05.001

Zhang, Y., Wei, F., & Van Horne, C. (2019). Individual ambidexterity and antecedents in a changing context. International *Journal of Innovation Management*, 23(7), 1950066. https://doi.org/10.1142/s136391961950021x

Zhao, K., Zong, B., & Zhang, L. (2020). Explorative and exploitative learning in teams: Unpacking the antecedents and consequences. Frontiers in Psychology, 11, 2041. https://doi.org/10.3389/fpsyg.2020.02041

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Appendix A

PRISMA Protocol

Systematic Review: The Role of Management Control Systems in Organizational Ambidexterity

1. Title

PRISMA Protocol for the Systematic Review "The Role of Management Control Systems in Organizational Ambidexterity"

2. Background and Rationale

This protocol describes the methodological procedures used to conduct a systematic literature review of how management control practices are associated with organizational ambidexterity. The review synthesizes theoretical and empirical evidence concerning the roles attributed to MCS and performance measurement systems in organizations pursuing exploration and exploitation.

3. Objectives

To analyze the roles attributed to management control practices and how these practices are associated with organizational ambidexterity involving exploration and exploitation.

4. Main Research Question (PICO Structure)

Population (P). Organizations pursuing ambidexterity through exploration and exploitation activities.

Intervention (I). Management control practices, including formal controls, informal controls and performance measurement practices.

Comparison (C). Not applicable.

Outcome (O). Relationships with organizational ambidexterity, including the coordination, integration, or balancing of exploration and exploitation.

Guiding Question.

How are management control practices associated with organizational ambidexterity involving exploration and exploitation?

5. Eligibility Criteria

Inclusion Criteria

• Studies addressing organizational ambidexterity
• Studies addressing management control or managerial accounting practices
• Peer-reviewed empirical, conceptual, review-based, or simulation-based articles
• Full-text available
• Publications from 2003 to 2024
• Articles in English, Portuguese or Spanish

Exclusion Criteria

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• Studies not addressing management control
• Studies not addressing ambidexterity
• Non–peer-reviewed documents (e.g., book chapters, theses, conference papers)
• Publications prior to 2003
• No access to full text

6. Information Sources

The systematic search was conducted in:

• Scopus
• Web of Science

7. Search Strategy

The searches were conducted on April 21, 2026, covering studies published from 2003 to December 31, 2024. Studies first published online by December 31, 2024, were considered eligible, even when subsequently assigned to a journal issue published in 2025.

Scopus, title, abstract, and keyword fields: TITLE-ABS-KEY((AMBIDEXT* OR (EXPLOITATION AND EXPLORATION)) AND (PERFORMANCE OR OUTCOME* OR SUCCESS OR FAILURE) AND ("MANAGEMENT CONTROL" OR "PERFORMANCE MANAGEMENT" OR MCS OR PMS))

Web of Science Core Collection, Topic field: TS=((AMBIDEXT* OR (EXPLOITATION AND EXPLORATION)) AND (PERFORMANCE OR OUTCOME* OR SUCCESS OR FAILURE) AND ("MANAGEMENT CONTROL" OR "PERFORMANCE MANAGEMENT" OR MCS OR PMS))

The searches covered articles published between 2003 and 2024. The Scopus search retrieved 70 records, and the Web of Science search retrieved 74 records.

8. Study Selection Process

1. Export of search results into reference management software
2. Removal of duplicates
3. Title and abstract screening using predefined criteria
4. Full-text assessment
5. Inclusion of studies meeting all eligibility criteria

The searches retrieved 144 records, comprising 70 records from Scopus and 74 from Web of Science. After the removal of 25 duplicates, 119 records were screened by title and abstract. Forty-six records were excluded at this stage, and 73 articles proceeded to full-text assessment. Following the exclusion of 36 articles during full-text assessment, 37 studies were included in the final review.

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9. Data Extraction Fields

The following information was extracted from each study and forms the basis of Appendix B:

• Author(s)
• Title
• Year
• Journal
• Methodology
• Ambidexterity Type
• Level of Analysis

During the synthesis stage, the coding was refined to distinguish the analytical role of MCS from their conceptual or organizational function. This refinement is reported in Appendix B and did not affect study eligibility or selection. The title and abstract screening, full-text assessment, and initial coding were conducted by the first author. The screening results and coding classifications were subsequently reviewed by the two coauthors. As the procedures were not conducted independently by multiple coders, no formal inter-coder agreement statistic was calculated.

10. Synthesis of Results

A qualitative synthesis was performed focusing on:

· analytical roles attributed to management control practices in relation to exploration and exploitation
· complementarities between formal and informal controls
· relationships between performance measurement systems and organizational ambidexterity
• theoretical and methodological patterns across studies

The synthesis emphasizes how MCS are associated with ambidextrous behavior and how different configurations of control systems relate to ambidextrous outcomes. Given the methodological heterogeneity of the included studies, evidential strength was considered according to study design. Statistical associations, qualitative findings, conceptual propositions, review-based conclusions, and simulation-based results were distinguished during the synthesis. No single standardized methodological quality appraisal instrument was applied across all study types.

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Appendix B

Summary Table of Included Studies

Note: Studies are ordered first by study type and then by the analytical role assigned to MCS. This ordering serves a classificatory purpose and does not represent a hierarchy of evidential strength.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Leitner, S., & Wall, F.	Decision-facilitating information in hidden-action setups: an agent-based approach	2021	Journal of Economic Interaction and Coordination	Micro/Agent-based——	Decision-facilitating info	Not explicit ambidexterity	Decision-facilitating information, especially about the environment, improves performance by shifting attention from ex post performance evaluation to ex ante informational support.	Agent-based computational modeling	Simulation-based	Independent variable	Provides decision-facilitating information that supports managerial search and improves performance by informing decision makers about the environment and feasible actions.
Wall, F.	Adaptation of the boundary system in growing firms: an agent-based computational study on the role of complexity and search strategy	2020	Economic Research-Ekonomska Istraživanja	Organizational	Boundary systems	Exploration, exploitation, ambidextrous search	Boundary systems must balance opportunity-seeking and constraints, and their effectiveness depends on task complexity and search strategies.	Agent-based computational modeling	Simulation-based	Dependent variable	Represents the boundary system that emerges and adapts in response to task complexity, organizational growth, and exploitative, explorative, or ambidextrous search strategies.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Adler, R., Hiromoto, T., & Suzuki, H.	Amoeba management and organizational ambidexterity: Similarities, differences, and implications for organizational fit and success	2020	International Journal of Productivity and Performance Management	Organizational	Amoeba management	Organizational ambidexterity	Amoeba management and organizational ambidexterity share an overarching philosophy of agility, but differ substantially in structure, culture, planning horizon, measures, employee involvement, and leadership.	Conceptual literature review	Conceptual	Not formally modeled, conceptual comparison	Provides a performance-management basis for comparing amoeba management and organizational ambidexterity and assessing their organizational fit.
Ahmad, F., Soomro, S. A., Tunio, F. H., Ding, Y., & Qureshi, N. A.	Performance Monitoring, Subordinate's Felt Trust and Ambidextrous Behavior: Toward a Conceptual Research Framework	2022	Frontiers in Psychology	Individual	Electronic monitoring	Individual ambidexterity	Electronic performance monitoring influences ambidextrous behavior through psychological mechanisms such as felt trust and leader-member exchange.	Conceptual framework	Conceptual	Independent variable in a conceptual model	Positions developmental electronic performance monitoring as an antecedent of ambidextrous behavior through felt trust and perceived leader-member exchange quality.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Hansen, E. G., & Schaltegger, S.	Sustainability Balanced Scorecards and their Architectures: Irrelevant or Misunderstood?	2018	Journal of Business Ethics	Organizational	Sustainability BSC	Sustainability exploration–exploitation	Sustainability balanced scorecards function as tools for strategy implementation, and their ambidextrous potential depends on how their architecture aligns with organizational strategy and priorities.	Conceptual analysis	Conceptual	Not formally modeled, conceptual contingency framework	Provides alternative sustainability balanced scorecard architectures for aligning performance measurement with the organization's sustainability strategy and priorities.
Nielsen, C.	From innovation performance to business performance: Conceptualising a framework and research agenda	2019	Meditari Accountancy Research	Organizational	Innovation PMS	Innovation (ambidexterity-related)	Performance measurement systems can structure the link between innovation and business performance by integrating knowledge, learning, and value-creation processes.	Conceptual synthesis with case illustration	Conceptual	Not formally modeled, conceptual framework	Provides a performance-management structure that connects innovation activities, knowledge, learning, intellectual capital, and business performance.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
McCarthy, I. P., & Gordon, B. R.	Achieving contextual ambidexterity in R&D organizations: a management control system approach	2011	R&D Management	Organizational (R&D unit)	Formal and informal MCS	Contextual ambidexterity	Contextual ambidexterity is enabled by a complementary package of controls, combining belief and interactive systems for exploration and boundary and diagnostic systems for exploitation within the same organizational unit.	Conceptual study illustrated with biotechnology firm data	Conceptual	Antecedent in a conceptual model	Combines belief, boundary, diagnostic, and interactive control systems to induce and balance exploration and exploitation within the same R&D unit.
Ahmad, B., Yuan, J. B., Ashfaq, M., Shahzad, K., & Zhang, T. Y.	Does salesperson bricolage matter in fostering service-sales ambidexterity in B2B markets? A perspective through the sales management control system	2024	Industrial Marketing Management	Individual	Sales MCS	Individual ambidexterity	Behavior-based and outcome-based controls jointly stimulate bricolage, which in turn enables service-sales ambidexterity and value co-creation.	Survey	Empirical quantitative	Independent variable with an interaction effect	Combines behavior-based and outcome-based sales controls to stimulate salesperson bricolage, which subsequently supports service-sales ambidexterity.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Bedford, D. S.	MCS across different modes of innovation: Implications for firm performance	2015	Management Accounting Research	Organizational	Levers of Control	Organizational ambidexterity	Control levers operate differently depending on innovation mode, and in ambidextrous contexts diagnostic and interactive levers have interdependent effects on performance.	Survey	Empirical quantitative	Independent variable with interaction effects	Aligns the use and combination of control levers with different innovation modes, with diagnostic and interactive controls operating interdependently in ambidextrous firms.
Endenich, C., Lachmann, M., Schachel, H., & Zajkowska, J.	The relationship between MCS and innovativeness in start-ups: evidence for product, business model, and ambidextrous innovation	2023	Journal of Accounting and Organizational Change	Organizational	MCS design	Ambidextrous innovation	MCS design simultaneously supports multiple forms of innovation, suggesting that control systems can enable ambidextrous innovation across product, process, and business model domains.	Survey	Empirical quantitative	Independent variable with interaction effects	Configures individual control levers and their interdependencies according to product, business-model, or ambidextrous innovation in start-ups.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Getele, G. K., & Ruoliu, X.	The Key Impact of Management Modes for Innovation in SMEs	2024	IEEE Transactions on Engineering Management	Organizational	Management modes	Exploration–exploitation	Performance management, creativity, and risk-taking jointly support innovation and the coexistence of exploration and exploitation in SMEs.	Survey / quantitative	Empirical quantitative	Independent variable	Directs and evaluates SME activities through performance management, which is modeled as an antecedent of operational innovation.
Irfan, M., & Ahmad, B.	Modeling the influence of management control system and ambidextrous behavior on B2B customer relationships: a job demand-resource perspective	2024	Journal of Business & Industrial Marketing	Individual	Sales MCS	Individual ambidexterity	Different control systems have contrasting effects on ambidextrous behavior, highlighting trade-offs in control design.	Survey with SEM	Empirical quantitative	Independent variable	Directs salesperson behavior through behavior-based and outcome-based controls, which have contrasting effects on service-sales ambidexterity.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Kruis, A. M., Speklé, R. F., & Widener, S. K.	The Levers of Control Framework: An exploratory analysis of balance	2016	Management Accounting Research	Unit	Levers of Control	Innovation outcomes	Balance among different levers of control, rather than isolated use, is associated with improved outcomes and suggests that complementary control configurations support ambidextrous capabilities.	Survey	Empirical quantitative	Not formally modeled, configurational analysis	Identifies alternative balancing arrangements among the four levers of control and relates these configurations to organizational contingencies and performance.
Lee, M. T., & Widener, S. K.	The Performance Effects of Using Business Intelligence Systems for Exploitation and Exploration Learning	2016	Journal of Information Systems	Organizational	Business intelligence systems	Exploration–exploitation	Business intelligence systems enhance the effectiveness of performance measurement and support both exploratory and exploitative learning.	Survey / empirical	Empirical quantitative	Independent variable	Uses different business intelligence systems to support exploitative and explorative learning, which mediate their relationships with performance outcomes.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Malagueño, R., López-Valeiras, E., & Gómez-Conde, J.	Balanced scorecard in SMEs: effects on innovation and financial performance	2018	Small Business Economics	Organizational	Balanced Scorecard	Innovation (related to ambidexterity)	The balanced scorecard supports innovation and financial performance by integrating multiple performance dimensions, suggesting that balanced measurement systems can facilitate ambidextrous outcomes.	Survey + OLS regression	Empirical quantitative	Independent variable	Integrates financial and non-financial measures through the balanced scorecard to support innovation, which subsequently contributes to financial performance.
Möller, K., Schmid, F., Seehofer, T. M., & Wenig, P.	How the Design of an Organizational Context Helps to Attain Contextual Ambidexterity	2022	Schmalenbach Journal of Business Research	Organizational	Control package	Contextual ambidexterity	Boundary systems and social context positively influence contextual ambidexterity, indicating selective rather than universal effectiveness of control elements.	Survey with SEM	Empirical quantitative	Independent variable	Combines belief and boundary systems with performance-management and social contexts as antecedents of contextual ambidexterity.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Mura, M., Micheli, P., & Longo, M.	The effects of performance measurement system uses on organizational ambidexterity and firm performance	2021	International Journal of Operations & Production Management	Organizational	Diagnostic + interactive PMS	Organizational ambidexterity	The dynamic tension between diagnostic and interactive uses of PMS enables the simultaneous pursuit of exploration and exploitation, supporting ambidexterity and enhancing firm performance.	Survey	Empirical quantitative	Independent variable (interaction effect); ambidexterity as mediator	Creates dynamic tension through the joint diagnostic and interactive uses of PMS, supporting organizational ambidexterity and, indirectly, firm performance.
Ylinen, M., & Gullkvist, B.	The Effects of Organic and Mechanistic Control in Exploratory and Exploitative Innovations	2014	Management Accounting Research	Project	Organic + mechanistic controls	Exploratory vs exploitative innovation	Organic and mechanistic controls have complementary effects on innovation performance, with organic controls more relevant for exploratory innovation and combined use enhancing broader innovation outcomes.	Survey with PLS	Empirical quantitative	Independent and moderating roles	Supports innovation through the direct and indirect effects of organic and mechanistic controls and through their complementary interaction in exploratory and exploitative projects.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Zhao, K., Zong, B., & Zhang, L.	Explorative and Exploitative Learning in Teams: Unpacking the Antecedents and Consequences	2020	Frontiers in Psychology	Team	Team controls and leadership	Team ambidexterity	Leader power sharing and leader control behaviors enhance team explorative and exploitative learning, which improve performance via creativity and task completion.	Survey	Empirical quantitative	Independent variable	Directs team behavior through leader management control, which promotes exploitative learning and contributes to team performance through task completion.
Antonini, C., & Gomez-Conde, J.	Environmental MCS and environmental innovation: Unintended consequences of the EU non-financial reporting directive	2024	Management Accounting Research	Organizational	Environmental MCS	Environmental ambidexterity	Regulatory-driven EMCS increase adoption but initially reduce environmental innovation due to lack of flexibility and misfit, with effects becoming positive over time as systems adapt	Archival study using difference-in-differences design	Empirical quantitative	Independent variable with temporal effects	Shapes environmental innovation through environmental management control systems whose effects differ between voluntary and regulatory-driven adoption and change over time.

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Stouthuysen, K., Slabbinck, H., & Roodhooft, F.	Formal controls and alliance performance: The effects of alliance motivation and informal controls	2017	Management Accounting Research	Network/Interorganizational	Formal + informal controls	Organizational ambidexterity	The effectiveness of formal controls depends on alliance motivation and on their complementarity with informal controls.	Survey	Empirical quantitative	Independent and moderating variables	Aligns formal outcome and behavior controls with alliance motivation, while informal controls condition the effectiveness of those formal controls.
Bedford, D. S., Bisbe, J., & Sweeney, B.	Performance measurement systems as generators of cognitive conflict in ambidextrous firms	2019	Accounting, Organizations and Society	Top Management Team (TMT)	PMS design	Innovation ambidexterity	Balanced PMS design combined with intensive use for debate generates cognitive conflict, which enables innovation ambidexterity.	Survey	Empirical quantitative	Dependent and independent variables; cognitive conflict as mediator	Translates competence ambidexterity into innovation ambidexterity by combining balanced performance measures with intensive debate to generate cognitive conflict.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Severgnini, E., Vieira, V. A., & Cardoza Galdamez, E. V.	The indirect effects of performance measurement system and organizational ambidexterity on performance	2018	Business Process Management Journal	Organizational	PMS uses	Organizational ambidexterity	Performance measurement system dimensions influence organizational performance indirectly through ambidexterity.	Survey with SEM	Empirical quantitative	Independent variable with ambidexterity as mediator	Focuses organizational attention, legitimizes strategic choices, and supports strategic decision-making, thereby strengthening ambidexterity and indirectly improving performance.
Kreutzer, M., Cardinal, L. B., Walter, J., & Lechner, C.	Formal and Informal Control as Complement or Substitute? The Role of the Task Environment	2016	Strategy Science	Business unit	Formal + informal controls	Exploration–exploitation	Formal and informal controls operate as complements rather than substitutes, jointly improving performance, with complementarity contingent on task environment and level of exploration	Survey with 184 strategic initiative teams	Empirical quantitative	Independent variables (formal and informal controls with interaction effect)	Combines formal and informal controls as complementary mechanisms whose joint performance effect varies with the degree of exploration.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Wabnegg, M.	Fostering ambidexterity among R&D employees: The dilemma of performance measures and how to overcome it	2024	Management Accounting Research	Individual and R&D teams	Performance measures	Individual + team ambidexterity	Patent-based and customer-based performance measures individually distort effort toward exploration or exploitation, and only when complemented by organic controls can employees reconcile both and achieve ambidexterity	Survey with 269 firms in R&D-intensive industries	Empirical quantitative	Independent and moderating variables	Uses patent-based and customer-based performance measures to direct effort toward exploration or exploitation, while organic controls help employees recognize and realize synergies between the two activities.
Cao, R., & Jiang, R.	Resolving Strategic Dilemmas in Ambidextrous Organizations: An Integrated Second-Order Factor Model Perspective	2022	Frontiers in Psychology	Organizational	Strategic control	Organizational ambidexterity	Ambidexterity is achieved through higher-order integrative mechanisms that reconcile competing demands, rather than through isolated structural choices.	Survey with second-order factor model	Empirical quantitative	Component of the independent construct and moderating variable	Integrates radical performance management into the higher-order organizational ambidexterity construct and uses performance measurement balance to strengthen its relationship with innovation ambidexterity.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Daowadueng, P., Hoozée, S., Jorissen, A., & Maussen, S.	Do costing system design choices mediate the link between strategic orientation and cost information usage for decision making and control?	2023	Management Accounting Research	Unit	Costing system design	Not explicit ambidexterity	Costing system design choices mediate the link between exploration orientation and cost information usage, but not in exploitation contexts.	Survey with SEM	Empirical quantitative	Mediating variable	Transmits the effect of exploration-oriented strategy to the use of cost information for decision-making and control through costing-system design choices.
Bedford, D. S., Bisbe, J., & Sweeney, B.	The joint effects of performance measurement system design and TMT cognitive conflict on innovation ambidexterity	2022	Management Accounting Research	Top Management Team (TMT)	PMS design	Innovation ambidexterity	PMS scope enhances, whereas PMS integration constrains, the effects of cognitive conflict on innovation ambidexterity.	Survey / regression analysis	Empirical quantitative	Moderating variable	Conditions the effect of TMT cognitive conflict on innovation ambidexterity, with PMS scope strengthening and PMS integration weakening that relationship.

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Cardoni, A., Zanin, F., Corazza, G., & Paradisi, A.	Knowledge Management and Performance Measurement Systems for SMEs' Economic Sustainability	2020	Sustainability	Organizational	Knowledge management + PMS	Organizational ambidexterity	Performance measurement systems strengthen the relationship between knowledge management approaches and sustainability, particularly by amplifying exploration-oriented strategies.	Survey with OLS regression	Empirical quantitative	Moderating variable	Strengthens the relationships between knowledge-management approaches and economic sustainability through diagnostic and interactive PMS uses.
Umans, T., Smith, E., Andersson, W., & Planken, W.	Top management teams' shared leadership and ambidexterity: the role of management control systems	2020	International Review of Administrative Sciences	Organizational	MCS + shared leadership	Organizational ambidexterity	Shared leadership is positively related to ambidexterity, and new public MCS strengthen this relationship, whereas traditional controls do not.	Survey	Empirical quantitative	Moderating variable	Conditions the relationship between TMT shared leadership and organizational ambidexterity through traditional and new public management control systems

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Hadji, S., Gholizadeh, P., & Naghavi, N.	Diagnosing of human resource performance management based on lack of ambidextrous learning themes: a case study of public Iranian banking system	2022	International Journal of Ethics and Systems	Organizational	HR performance management	Ambidextrous learning	The absence of ambidextrous learning mechanisms weakens the effectiveness of performance management systems by undermining strategic alignment and learning integration.	Delphi + interpretive structural analysis	Mixed methods	Dependent variable	Represents the human-resource performance-management functions whose deficiencies are diagnosed in relation to the absence of ambidextrous-learning themes.
Sugarman, B.	Organizational Learning and Reform at the New York City Police Department	2010	The Journal of Applied Behavioral Science	Organizational	Learning controls	Individual ambidexterity	Organizational learning processes can support ambidextrous outcomes, but the role of formal control systems is contextual rather than explicit.	Single case study	Qualitative empirical	Not formally modeled, contextual background	Provides a performance and learning infrastructure through CompStat that supports organizational reform and learning without occupying a formal variable position.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
Badu, D. A., & Micheli, P.	How performance measurement systems enable or hinder organizational ambidexterity	2025	International Journal of Operations & Production Management	Organizational	PMS uses	Organizational ambidexterity	Performance measurement systems can both enable and hinder ambidexterity depending on how they are structured and used.	Qualitative case study	Qualitative empirical	Not formally modeled, qualitative explanatory role	Enables or hinders organizational ambidexterity according to how performance measures are structured, discussed, adapted, and used across organizational functions.
Evans, J. M., Commisso, E., Grudniewicz, A., Im, J., Veillard, J., & Richards, G.	Managing the Performance of Healthcare Networks: A 'Dance' Between Control and Collaboration	2024	Public Management Review	Network/Interorganizational	Network controls	Interorganizational ambidexterity	Performance management systems simultaneously enable control and collaboration in interorganizational networks through structural, goal, and behavioral mechanisms.	Qualitative case study	Qualitative empirical	Not formally modeled, qualitative contextual role	Embeds control and collaboration in performance-management structures, goals, and behaviors to support network-governance ambidexterity.

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Ramesh, B., Mohan, K., & Cao, L.	Ambidexterity in Agile Distributed Development: An Empirical Investigation	2012	Information Systems Research	Team	Agile control practices	Team ambidexterity	Contextual ambidexterity emerges from a combination of formal performance management practices and informal social mechanisms that jointly address tensions between alignment and adaptability.	Qualitative case study	Qualitative empirical	Not formally modeled, qualitative configurational framework	Combines formal performance-management practices and informal social mechanisms to reconcile alignment and adaptability in agile distributed development.
Gschwantner, S., & Hiebl, M. R. W.	MCS and organizational ambidexterity	2016	Journal of Management Control	Organizational	MCS package	Organizational ambidexterity	A package of management control systems, rather than one specific control, is needed to support ambidexterity, often through complementary effects.	Short survey paper / literature review	Narrative review	Not formally modeled, review synthesis	Synthesizes how management-control packages and the balance among different controls can facilitate organizational ambidexterity.

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Author(s)	Title	Year	Journal	Level of – analysis	MCS concept	Ambidexterity feature	Key insight	Methodology	Study Type	Analytical role of MCS	Conceptual or organizational function of MCS
García-Hurtado, D., Devece, C., Zegarra-Saldaña, P. E., & Crisanto-Pantoja, M.	Ambidexterity in entrepreneurial universities and performance measurement systems: A literature review	2024	International Entrepreneurship and Management Journal	Organizational	PMS design and use	Organizational ambidexterity	Performance measurement systems are discussed as organizational mechanisms that can support ambidexterity in universities, although the evidence remains fragmented and conceptually dispersed.	Systematic literature review	Systematic review	Not formally modeled, systematic review synthesis	Organizes the performance indicators and management processes associated with exploration and exploitation in entrepreneurial universities.

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