Review of Managerial Science
https://doi.org/10.1007/s11846-026-01002-3

ORIGINAL PAPER

The metamorphosis of organizational resilience: a strategic roadmap for SMEs in the digital age

Faisal Saeed Malik[1] · **Orestis Terzidis**[1]

Received: 5 February 2025 / Accepted: 3 February 2026

Abstract

Small and medium-sized enterprises (SMEs) are increasingly exposed to complex, recurring disruptions—ranging from pandemics and geopolitical crises to supply chain reconfigurations and climate shocks. While resilience has become a strategic imperative, existing literature often treats it as a static, single-level capacity. This study advances the discourse by conceptualizing resilience as a multilevel, metamorphic process—one that evolves through dynamic interactions across individual, organizational, and inter-organizational levels. Using a hybrid systematic literature review (SLR) of 76 peer-reviewed studies published between 2020 and 2025, the paper combines bibliometric mapping with the Theory–Context–Characteristics–Methodology (TCCM) framework to identify dominant theoretical perspectives, contextual contingencies, firm-level attributes, and methodological patterns. The findings reveal that adaptive leadership, digital transformation, and inter-organizational collaboration are key enablers of SME resilience. At the individual level, soft skills such as emotional and cultural intelligence shape managerial foresight. At the organizational level, agility and digital reconfiguration strengthen strategic responses to uncertainty. At the inter-organizational level, embeddedness in global value chains (GVCs) offers both opportunity and exposure, requiring careful orchestration between autonomy and cooperation. By integrating cross-level insights, this study offers a conceptual roadmap for building SME resilience and proposes a metamorphic model that captures resilience as a recursive and transformative capability. The review contributes theoretically by bridging fragmented perspectives and methodologically by demonstrating the utility of hybrid SLRs. Actionable implications are provided for scholars, policymakers, and SME practitioners seeking to enhance resilience amid accelerated turbulence.

Keywords Organizational resilience · Small and medium-sized enterprises (SMEs) · Digital transformation · Global value chains (GVCs) · TCCM · Systematic literature review (SLR)

Extended author information available on the last page of the article

Published online: 16 March 2026

JEL classification D81 · D91 · F23 · L2 · L22 · O3

1 Introduction

Small and medium-sized enterprises (SMEs) form the economic backbone of most countries, accounting for more than 90% of businesses and contributing up to 60% of employment worldwide (OECD 2023). However, SMEs are disproportionately exposed to crises—whether stemming from pandemics, climate events, geopolitical instability, or supply chain disruptions—due to their limited slack resources, narrower networks, and heightened sensitivity to exogenous shocks (Hillmann 2021; Kano et al. 2022). In this context, resilience has emerged as a critical capability, enabling SMEs not only to absorb shocks but also to transform and thrive amid uncertainty strategically.

While previous research has examined resilience across various domains, recent studies reveal that resilience is not a static attribute but a multilevel, dynamic, and metamorphic capability. It evolves through recursive feedback between individual cognition, organizational learning, and inter-organizational interactions (Conz and Magnani 2020; Aversa et al. 2024). Individual leaders play a pivotal role in initiating change through emotional intelligence, cultural awareness, and strategic foresight (Judge et al. 2009; Kunz and Sonnenholzner 2023), while organizational capabilities—such as digitalization, ambidexterity, and resource reconfiguration—anchor structural adaptation (Warner and Wäger 2019; Roffia and Dabić 2024). At the inter-organizational level, network embeddedness, institutional trust, and power dynamics shape the SME's ability to co-adapt and innovate (Gereffi 2020; Humphrey 2021; Luo et al. 2024). Despite growing interest, few reviews capture this cross-level interplay or theorize resilience as a time-evolving metamorphosis rather than an outcome state.

Numerous systematic literature reviews (SLRs) have examined resilience in isolation—focusing, for example, on supply chains, individual psychology, or digital strategies (Denyer et al. 2011; Conz and Magnani 2020). However, these often adopt single-level or typological perspectives, leaving unaddressed how micro-, meso-, and macro-level mechanisms interact dynamically over time. Moreover, recent shocks have accelerated the speed and complexity of disruptions, calling for new frameworks that reflect resilience as a process of bouncing forward rather than merely bouncing back (Wenzel et al. 2021). To address these gaps, the present study introduces a hybrid SLR that integrates bibliometric analysis with the TCCM framework to provide a structured, multilevel synthesis of SME resilience research from 2020 to 2025. The hybrid approach allows us to map the field's intellectual structure and identify underexplored intersections across theory, context, and methodology (Malik and Terzidis 2025a; Paul et al. 2024).

To guide this inquiry, the review is anchored around one overarching research question:

How do individual, organizational, and inter-organizational factors collectively interact to build and sustain resilience in SMEs under conditions of disruption and uncertainty?

This framing allows the paper to move beyond summary toward theorizing resilience as a metamorphic capability—one that evolves through the alignment of leadership, firm routines, and collaborative ecosystems over time. It also enables us to identify underexplored tensions such as autonomy versus dependency, resource scarcity versus innovation, and structural rigidity versus agility.

Methodologically, this study draws on 76 peer-reviewed articles published in high-impact journals indexed in Web of Science (WoS) between 2020 and January 2025. We chose WoS for its quality-filtered coverage and analytical compatibility with bibliometric tools. The decision to limit the timeframe to 2020–2025 reflects the transformative impact of COVID-19 and other recent macroeconomic shifts on resilience discourse. We explain and visualize this selection using a PRISMA framework and offer transparency regarding inclusion criteria, keyword strings, and database choices.

Theoretically, this review contributes to the evolving understanding of resilience by integrating perspectives from dynamic capabilities, organizational behavior, digital strategy, and circular economy research. It emphasizes the role of managerial soft skills—emotional and cultural intelligence—as well as the implications of global phenomena such as deglobalization and regional conflict for SMEs' survival and adaptation. Conceptually, we propose a novel metamorphic pathway of SME resilience that reflects recursive transitions from reactive resistance to strategic renewal. We also offer a visual framework for SME resilience deployment across crisis phases, synthesizing actionable insights for both scholars and practitioners.

The remainder of this paper is structured as follows. Section 2 outlines the conceptual background and justifies the theoretical lens. Section 3 presents the methodology, detailing the hybrid SLR approach (Bibliography and TCCM analysis) and inclusion protocol. Section 4 provides findings; Sect. 5 discusses; Sect. 6 elaborates on a future research agenda; and the implications of the research for theory, researchers, and policy. Section 7 concludes the study.

2 Literature review and theoretical background

2.1 Definition and scope of organizational resilience

Organizational resilience refers to a firm's capability to absorb disruptions, adapt to change, and recover while maintaining strategic continuity and renewal. Hillmann (2021) conceptualizes resilience as an integrative capability consisting of preparation, response, recovery, and adaptation, and recent research advances this view by positioning resilience as a dynamic, multilevel, and transformational process rather than a purely reactive mechanism (González-Serrano et al. 2023; Conz et al. 2023). This reconceptualization is particularly salient for SMEs, whose structural flexibility and innovation capacity are counterbalanced by resource scarcity (Conz and Mag-

nani 2020; Aversa et al. 2024). Studies increasingly emphasize the transition from resilience as stability under distress to resilience as strategic evolution, where adversity catalyzes capability development and long-term competitive advantage (Kraus et al. 2021; Malik and Terzidis 2025b).

This evolution must also be understood in light of heightened environmental turbulence. Global shocks—including COVID-19, geopolitical instability, and technological discontinuities—have intensified the need for proactive and capability-oriented resilience (Seong et al. 2024; McKinsey and Company 2023). Policy analyses also reinforce this shift: the OECD SME Outlook (2023) and the Annual Report on European SMEs 2024/2025 highlight resilience not as optional but as foundational for the survival of more than 99% of enterprises worldwide and two-thirds of employment in the EU (OECD 2023; Schulze et al. 2025). Taken together, resilience has moved to the center of managerial and policy discourse, requiring a multilevel understanding spanning leadership, organizational capabilities, and ecosystem embeddedness.

2.2 Emerging trends and multilevel approaches

Recent research demonstrates a clear shift toward multilevel conceptualizations of resilience, recognizing that adaptive outcomes emerge from the interaction of individual, organizational, and inter-organizational factors. At the micro level, entrepreneurial cognition and planning behaviors shape the capacity to navigate uncertainty; Campagnolo et al. (2022) show how immigrant entrepreneurs mobilize foresight, proactive coping, and ecosystem engagement to sustain venture continuity. Leonelli et al. (2024) further contend that entrepreneurial and organizational resilience co-develop rather than operate independently, particularly in SMEs where founders often directly determine strategic posture.

Digital transformation constitutes another defining trend. Technologies increasingly function as both shock absorbers and enablers of innovation (Isensee et al. 2023; Feliciano-Cestero et al. 2023; Sinha et al. 2024). Digital adoption enables rapid supply-chain reconfiguration, customer engagement, and market diversification, facilitating internationalization even under adverse conditions (Wang et al. 2024a, b, c). These observations align with theoretical developments in dynamic capabilities and organizational agility (Teece 2007; Kraus et al. 2021) and with practitioner insights showing digital maturity as a determinant of post-crisis performance (Beckenbauer et al. 2023; McKinsey and Company 2023; Williams et al. 2017). As the European Commission 2025 SME Performance Review notes, digitally resilient SMEs exhibit greater adaptability and competitiveness during periods of macroeconomic uncertainty. Collectively, these trends confirm the need for an integrative, cross-level synthesis of resilience mechanisms to address fragmentation across the literature.

2.3 Research levels

Resilience research spans three mutually reinforcing levels of analysis, individual, organizational, and inter-organizational, whose interactions jointly determine SMEs' adaptive trajectories.

Individual level. Leadership behaviors, cognition, and soft skills constitute the micro-foundations of resilience. Upper echelons theory (Hambrick and Mason 1984) explains how leaders' psychological attributes and experiential backgrounds shape their firms' responses to crises. While optimism and risk tolerance can stimulate strategic renewal, they also risk underestimating threats (Judge et al. 2009; Kunz and Sonnenholzner 2023; Anwar et al. 2023). Resilience-enhancing traits include emotional regulation, adaptability, strategic foresight, and global and cultural intelligence—capacities increasingly vital for SME leaders engaging across institutional and cultural contexts (Ang and Van Dyne 2015; Faiz et al. 2024; Galkina et al. 2023). These findings highlight the need to understand how individual soft skills become organizational capabilities, particularly in founder-led firms and lean managerial structures.

Organizational level. At the meso level, resilience manifests through adaptive architectures, including dynamic capabilities, digital transformation, ambidexterity, and learning cultures. SMEs that rapidly reconfigure resources, pivot business models, and leverage digital tools demonstrate stronger crisis absorption and recovery (Razavi Hajiagha et al. 2024; Isensee et al. 2023). Effectual and bricolage strategies also support survival when resources are constrained, enabling firms to improvise and exploit emerging opportunities (Simms et al. 2022; Baier-Fuentes et al. 2023). Ambidextrous organizations balance exploration and exploitation to remain adaptive without sacrificing operational continuity (Bettiol et al. 2023). Practitioner insights reinforce these mechanisms: Seong et al. (2024) and McKinsey and Company (2023) identify distributed decision-making, continuous learning, and digital fluency as structural pillars of resilient organizations.

Inter-organizational level. Beyond the firm boundary, resilience derives from ecosystem embeddedness, supply chain participation, and institutional support. Engagement in global value chains (GVCs) generates both exposure and advantage, offering access to resources, market diversification, and innovation spillovers (Gereffi 2020; Kano et al. 2022). Real-time coordination via digital platforms strengthens collaborative problem-solving during crises (Chatterjee et al. 2023). A critical mechanism here is *tertius iungens*—a network orientation in which actors intentionally connect previously unlinked stakeholders to enable innovation and cooperation under uncertainty (Obstfeld 2005). This orientation contrasts with *tertius gaudens*, which focuses on brokerage and advantage extraction, emphasizing instead the bridging and unifying role of leaders in ecosystems, particularly valuable when SMEs rely on relational capital rather than slack resources. Institutional scaffolding, including relief programs and innovation funding, further supports resilience during systemic shocks (Al-Omoush et al. 2024; Roundy and Im 2024; European Commission 2025).

Figure 1 provides a *baseline multilevel framework* of SME resilience, mapping the individual, organizational, and inter-organizational levels and their primary boundary conditions as identified in the literature. This framework is *descriptive in nature*, serving to organize and structure existing resilience insights across levels rather than to explain how resilience dynamically evolves over time. As such, it establishes the conceptual foundation for the subsequent analysis but does not yet specify the mechanisms through which SMEs transition from reactive survival to more proactive and transformative forms of resilience (Osiyevskyy et al. 2023).

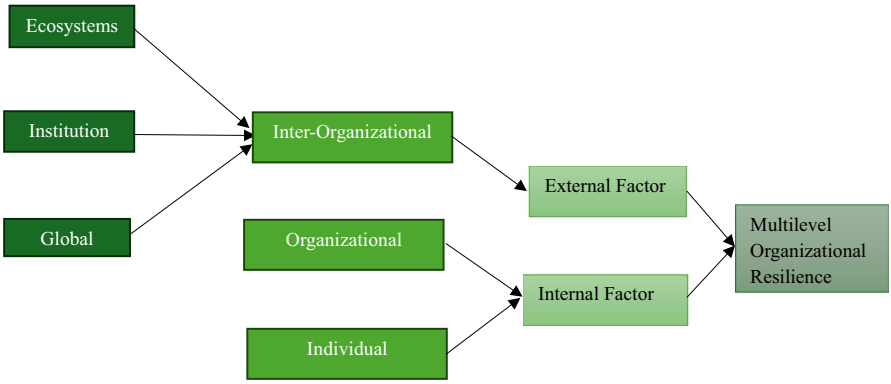

Fig. 1 Baseline Multilevel Framework of SME Resilience. Source: (Author 2026)

Across levels, resilience arises not from isolated determinants but from cross-level complementarities—where leadership cognition feeds organizational capabilities, which in turn shape inter-organizational positioning. This aligns with calls for prospectors'-style theory building that moves beyond summary synthesis toward integration and conceptual development (Breslin and Gatrell 2023; Gruner and Minunno 2024).

This framing lays the foundation for the multilevel synthesis that follows and provides both theoretical elaboration and practical insights for SMEs navigating volatile business environments.

3 Literature search strategy, inclusion protocol, and research design

This study adopts a hybrid review methodology combining systematic literature review (SLR), structured content analysis, and bibliometric triangulation to investigate how small and medium-sized enterprises (SMEs) develop organizational resilience and strategic adaptation capabilities in the face of external disruptions. The research design follows the PRISMA framework (Moher et al. 2009), widely recognized for its transparency in evidence synthesis, and aligns with methodological guidance for management reviews (Tranfield et al. 2003; Donthu et al. 2021; Kraus et al. 2020, 2023, 2024; Marzi et al. 2025). Data collection occurred between July 2024 and January 2025, guided by a five-phase protocol comprising scoping, database selection, automated filtering, manual screening, and structured synthesis (see Fig. 2).

3.1 Data source and search parameters

The Web of Science (WoS) Core Collection was selected for its transparent indexing standards, consistent metadata, and coverage of SSCI-ranked journals, facilitating replicability and bibliometric compatibility (Aria and Cuccurullo 2017; Merigó and Yang 2017; Vieira and Gomes 2009). While Scopus and Google Scholar offer broader coverage, WoS ensures greater quality control and metadata structure, which

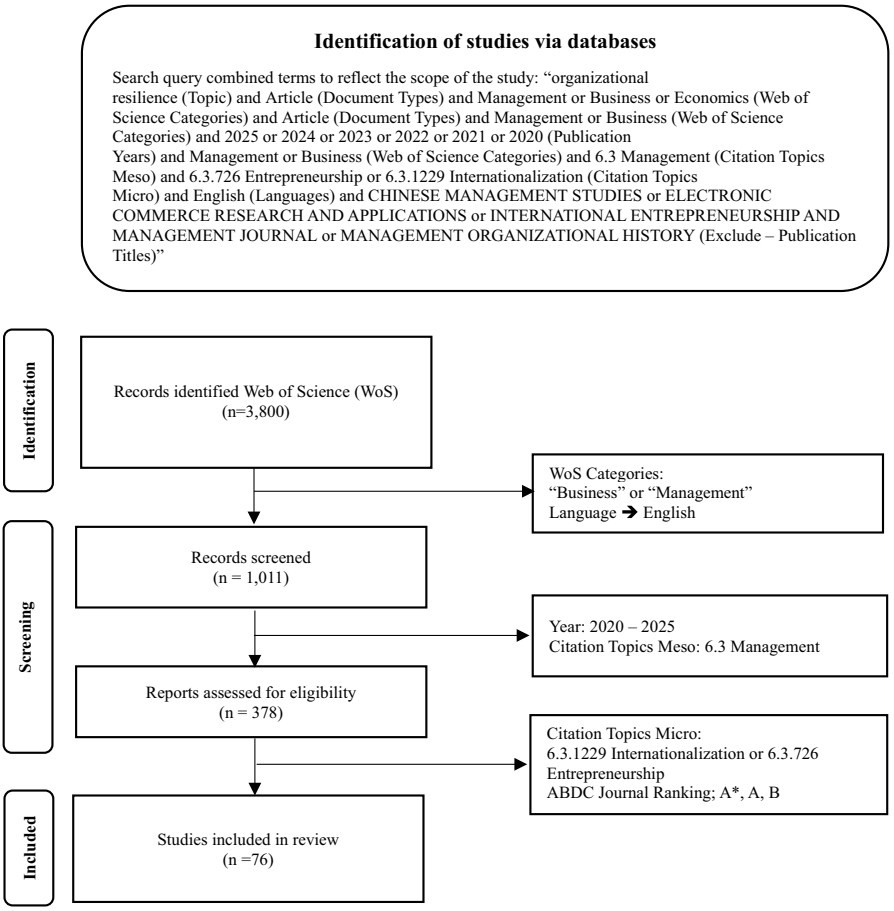

Fig. 2 Step-by-Step Protocol. Source: Author (2025)

are essential for bibliometric-systematic triangulation (Donthu et al. 2021; Cuervo-Cazurra et al. 2019). The search query was developed through iterative refinement, drawing on expert input, citation tracing, and alignment with relevant VHB 2024 citation codes. The final string targeted journal articles published between January 2020 and January 2025, capturing the most recent scholarly developments in response to turbulence such as COVID-19, climate volatility, and institutional instability (Conz and Magnani 2020; Malik and Terzidis 2025b; Wenzel et al. 2020).

3.2 Filtering protocol and inclusion criteria

A five-stage protocol was employed for article selection (see Fig. 2). The first stage involved automated keyword-based filtering using the terms "organizational resilience," "strategic adaptation," and "SMEs" in the WoS database, constrained to English-language peer-reviewed journal articles. In the second stage, subject categories were refined to include only "Business," "Management," and "Economics." Third,

citation indexing was narrowed to articles tagged within VHB 2024 domains—especially 6.3 "Management"—and to the subcategories "6.3.726 Entrepreneurship" and "6.3.1229 Internationalization." This yielded 3800 initial records. The fourth stage involved manual title and abstract screening to eliminate articles on unrelated domains such as health, psychology, or education, resulting in 378 articles. The fifth and final step involved full-text screening to evaluate conceptual alignment with SME resilience, empirical robustness, and contextual relevance, resulting in a final sample of 76 peer-reviewed articles (see Fig. 2).

3.3 Journal quality control and sampling scope

To ensure theoretical and empirical rigor, only articles published in journals ranked A*, A, or B by the Australian Business Deans Council (ABDC) were retained. The final dataset included publications from leading journals such as *Entrepreneurship Theory and Practice*, *Journal of International Business Studies*, *Organization Science*, *Journal of Business Research*, *Small Business Economics*, and *Entrepreneurship and Regional Development*, with thematic representation across entrepreneurship, internationalization, innovation, and crisis management domains (Donthu et al. 2021; TM et al. 2021; Marzi et al. 2025; McKinsey and Company 2023; OECD 2023; European Commission 2025). Articles in non-ranked or lesser-known journals were excluded unless they demonstrated exceptional conceptual depth and citation impact.

3.4 Analytical framework and coding procedure

All articles were systematically coded using the TCCM framework (Paul and Rosado-Serrano 2019; Paul et al. 2024), which classifies literature across four analytical dimensions. In the Theory dimension, studies were categorized by dominant conceptual underpinnings, including dynamic capabilities (Teece et al. 1997), institutional theory (Scott 2017), stakeholder theory (Al-Omoush et al. 2024), and organizational agility (Hillmann 2021). The Context dimension mapped geographic and sectoral diversity, including the influence of geopolitical risk, industry turbulence, and environmental complexity (Essuman et al. 2023; Seong et al. 2024). The Characteristics dimension focused on SME-specific traits, including size, innovation orientation, digitalization, and leadership configuration (Kraus et al. 2021; Santoro et al. 2020a, b).

The Methodology dimension recorded the use of qualitative, quantitative, or mixed methods, including advanced techniques such as machine learning and fuzzy-set qualitative comparative analysis (Ivanov and Dolgui 2021; Mariani et al. 2023; Hoon 2013). Coding was carried out manually by the authors, triangulated through inter-coder calibration and consensus building to ensure construct clarity and analytical consistency (Seuring and Gold 2012; Gruner and Minunno 2024; Breslin and Gatrell 2023).

3.5 Bibliometric mapping and AI-enabled quality control

To enhance transparency and reproducibility, bibliometric mapping was conducted using the Bibliometrix R package (Aria and Cuccurullo 2017) and complemented with Biblioshiny. The mapping identified high-frequency keywords, co-citation networks, and thematic clusters, enabling integration with the structured TCCM analysis. Additionally, AI tools were selectively deployed for quality enhancement—ChatGPT (language editing and consistency checks) and NotebookLM (thematic synthesis validation). These AI applications served as epistemic support layers without replacing human judgment, aligning with recent calls for responsible AI integration in academic research (Antons et al. 2023; Malik and Terzidis 2025a; Marzi et al. 2025).

4 Findings

This study adopts a hybrid systematic literature review (SLR) approach that integrates bibliometric analysis using the Bibliometrix R-package with the Theory–Context–Characteristics–Methodology (TCCM) framework to assess and synthesize scholarly research on SME organizational resilience. Grounded in Paul and Rosado-Serrano (2019) and Paul and Criado (2020), this hybrid method combines the analytical precision of bibliometric tools (Derviş 2019; Rajni et al. 2022) with the structured interpretive power of the TCCM framework (Paul et al. 2024), enabling a multi-level exploration of how resilience is theorized, contextualized, and empirically studied in SMEs. The findings are presented in two steps: (1) bibliometric analysis, and (2) TCCM-based synthesis.

4.1 Step 1: Bibliometric analysis

4.1.1 Publication profile and journal outlets

The bibliometric component identifies publication patterns and thematic concentrations across 76 high-quality peer-reviewed articles from 29 distinct academic outlets spanning entrepreneurship, international business, and management (see Table 1). These outlets include top-tier journals such as *Entrepreneurship Theory and Practice* (Anwar et al. 2023), *Journal of International Business Studies* (Luo 2021, 2022), *Journal of World Business* (Puhr and Muellber 2022), *Small Business Economics* (Santoro et al. 2021), and *Organization Science* (Williams and Shepherd 2021). These journals provide leading platforms for discourse on organizational resilience, strategic adaptation, and digital transformation in the context of SMEs.

The publication profile reveals a growing scholarly focus on understanding how SMEs respond to geopolitical tensions, crises, economic disruptions, and global volatility (Magnani et al. 2019, 2024; Sharma et al. 2024a, b). Additionally, several articles highlight how digital technologies and stakeholder engagement support firm adaptability (Al-Omoush et al. 2024; Santoro et al. 2020a, b). Nonetheless, the field still lacks strong theoretical integration with resilience frameworks such as dynamic

Table 1 List of published journals in international business and entrepreneurship. Source: Author (2025)

Publication titles	Count	ABDC-ranking
ENTREPRENEURSHIP THEORY AND PRACTICE	1	A*
INDUSTRIAL MARKETING MANAGEMENT	1	A*
JOURNAL OF INTERNATIONAL BUSINESS STUDIES	2	A*
JOURNAL OF WORLD BUSINESS	1	A*
ORGANIZATION SCIENCE	1	A*
PERSONNEL PSYCHOLOGY	1	A*
ASIA PACIFIC JOURNAL OF MANAGEMENT	5	A
BUSINESS STRATEGY AND THE ENVIRONMENT	1	A
ENTREPRENEURSHIP AND REGIONAL DEVELOPMENT	7	A
INTERNATIONAL JOURNAL OF PHYSICAL DISTRIBUTION LOGISTICS MANAGEMENT	1	A
INTERNATIONAL SMALL BUSINESS JOURNAL RESEARCHING ENTREPRENEURSHIP	3	A
JOURNAL OF BUSINESS RESEARCH	9	A
JOURNAL OF ENTERPRISE INFORMATION MANAGEMENT	3	A
JOURNAL OF INNOVATION KNOWLEDGE	2	A
JOURNAL OF INTERNATIONAL MANAGEMENT	3	A
JOURNAL OF SMALL BUSINESS MANAGEMENT	5	A
MANAGEMENT AND ORGANIZATION REVIEW	2	A
SMALL BUSINESS ECONOMICS	4	A
STRATEGIC ENTREPRENEURSHIP JOURNAL	1	A
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	1	A
EUROPEAN MANAGEMENT JOURNAL	1	B
INTERNATIONAL JOURNAL OF ENTREPRENEURIAL BEHAVIOR RESEARCH	9	B
JOURNAL OF INTELLECTUAL CAPITAL	1	B
JOURNAL OF ORGANIZATIONAL CHANGE MANAGEMENT	1	B
MANAGEMENT DECISION	3	B
MANAGERIAL AND DECISION ECONOMICS	1	B
MULTINATIONAL BUSINESS REVIEW	1	B
BUSINESS ETHICS THE ENVIRONMENT RESPONSIBILITY	1	B
REVIEW OF MANAGERIAL SCIENCE	4	

capabilities (Teece et al. 1997), creating openings for future studies to bridge these theoretical gaps (Conz and Magnani 2020; Humphrey 2021).

The findings also underscore the underutilization of cross-disciplinary perspectives, suggesting that resilience research in SMEs would benefit from integrating theories from strategic leadership, circular economy, and organizational learning (Florez-Jimenez et al. 2024; Roffia and Dabić, 2024). Doing so could help address structural and behavioral resilience challenges while enriching the theoretical landscape.

4.1.2 Authorship patterns and influential contributions

Table 2 ranks the most cited articles, identifying influential works such as Santoro et al. (2021) in *Small Business Economics* and Santoro et al. (2020a, b) in *Jour-*

Table 2 Top cited authors. Source: Author (2025)

Scholars	Year	Publications outlet	Total citations	TC per year	Normalized TC
Santoro, Messeni-Petruzzelli, Del Giudice,	2021	Small Business Economics	114	22.80	2.88
Santoro, Bertoldi, Giachino, Candelo,	2020	Journal of Business Research	100	16.67	2.50
Hadjielias, Christofi, Tarba,	2022	Small Business Economics	76	19.00	2.92
Luo,	2021	Journal of International Business Studies	69	17.25	2.65
Williams, Shepherd,	2021	Organizational Science	44	8.80	1.11
Anwar, Coviello, Rouziou,	2023	Entrepreneurship Theory and Practice	40	13.33	3.70
Su, Junge,	2023	European Management Journal	40	13.33	3.70
Li PP,	2020	Management and Organization Review	34	5.67	0.85
Greene, Rosiello,	2020	International Small Business Journal	28	4.67	0.70
Luo,	2022	Journal of International Business Studies	27	6.75	1.04

nal of Business Research, which received 114 and 100 citations, respectively (see Table 2). These foundational studies significantly contribute to understanding how SMEs engage in entrepreneurial resilience and stakeholder collaboration. Hadjielias et al. (2022) further contribute by analyzing resource recombination and family firm dynamics, receiving 76 citations.

Recent contributions—such as Anwar et al. (2023) in *Entrepreneurship Theory and Practice* and Su and Junge (2023) in *European Management Journal*—have each gained 40 citations, reflecting rising interest in multi-level and strategy-based resilience research. Luo (2022) emphasizes digital transformation and its role in crisis navigation, registering 69 citations in *JIBS*. Similarly, studies by Williams and Shepherd (2021) and Li (2020) examine learning mechanisms, sensemaking, and interorganizational knowledge sharing during crises.

Citation trends indicate a shift from static definitions of resilience toward more dynamic conceptualizations, including innovation capacity, digital capability, and networked adaptation (Su and Junge 2023; Kano et al. 2022). The convergence of these approaches calls for a more integrative resilience research framework—one that balances classical resource-based views with contemporary digital and relational logics (Li 2020; Roffia and Dabić 2024).

4.1.3 Temporal trends in resilience research

The evolution of resilience research from 2020 to 2024 reveals a discernible shift in theoretical emphasis, contextual application, and methodological sophistication. Early publications in the post-COVID period (2020–2021) predominantly focused on crisis response and short-term survival strategies—such as operational redundancy, supply chain buffering, and resource slack (Hillmann 2021; Teece 2007). This phase emphasized resilience as a reactive capability designed to restore equilibrium.

By contrast, publications from 2022 onward illustrate a paradigm shift toward more proactive and integrative views of resilience, encompassing dynamic capabilities, digital transformation, and stakeholder engagement (Feliciano-Cestero et al. 2023; Gkeredakis et al. 2021; Roffia and Dabić, 2024; González-Serrano et al. 2023). The radar chart (see Fig. 3) and bibliographic coupling results show increased convergence around concepts such as agility, innovation, leadership cognition, and ecosystem-based adaptation. Concurrently, resilience has been recast from a firm-centric competence to a multilevel, recursive process that intersects individual traits, organizational routines, and inter-organizational configurations (Magnani et al. 2024; Napier et al. 2024).

Geopolitical shocks, digitalization, and supply chain fragmentation have acted as accelerators, pushing researchers to examine longer-term strategic responses, such as digital platform adoption, relational contracting in global value chains (GVCs), and adaptive leadership (Humphrey 2021; Faiz et al. 2024). This temporal metamorphosis highlights a growing alignment with anticipatory resilience and continuous learning models, replacing linear recovery paradigms with dynamic adaptation loops.

4.1.4 Regional contributions and global distribution

The 76 studies in the SLR span 38 countries, showing the international scope of SME resilience research (see Fig. 4). The United States leads with 20 contributions (26.3%) and shapes discourse through work on leadership, adaptation, and navigation of uncertainty (Anwar et al. 2023; Luo 2022; Santoro et al. 2021). Italy follows with 17 studies (22.4%), focusing on family businesses and women-led firms (Casprini et al. 2023). England and China each contribute 13 studies (17.1%), emphasizing

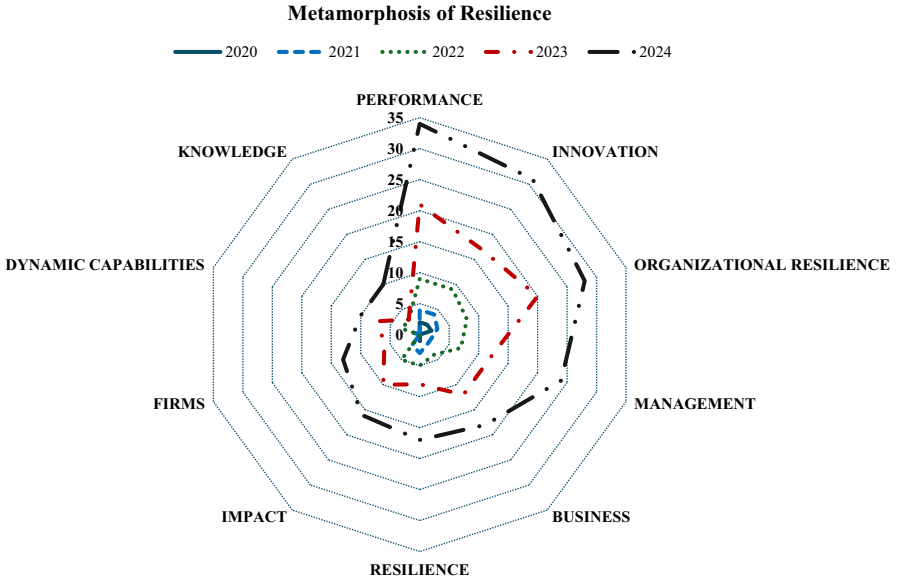

Fig. 3 Evolution of organizational resilience. Source: Author (2025)

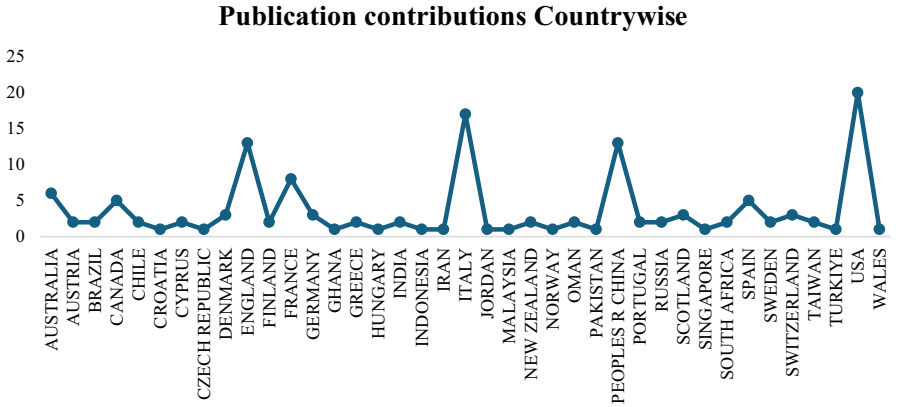

Fig. 4 Countrywise publication contribution. Source: Author (2025)

leadership and digital strategies (Mariani et al. 2023; Galkina et al. 2023). France (8 studies, 10.5%) and Australia (6 studies, 7.9%) center on networks and global value chains (Bettiol et al. 2023; Roffia and Dabić, 2024).

Northern Europe—including Denmark, Germany, and Switzerland—contributes via studies on institutional engagement and co-creation (Baier-Fuentes et al. 2023; Gottschalck et al. 2024), while Southern Europe and South America offer perspectives on resource-scarce environments (Casprini et al. 2023; Galkina et al. 2023). Asia's contributions—mainly from India (Anwar et al. 2023; Chaudhary et al. 2024)—focus on systemic uncertainty and institutional voids. Studies from Pakistan, Turkey, and Malaysia highlight underrepresented regions (Essuman et al. 2023; Humphrey 2021), underscoring the need for more localized exploration of SME resilience.

This uneven geographical distribution indicates the dominance of Western perspectives and signals the need for inclusive, context-sensitive resilience research to inform global SME strategy and policy (Klyver and Nielsen 2024; Luo et al. 2022).

4.2 Step 2: TCCM-based analysis

To deepen analytical insights, the study applies the TCCM framework, categorizing findings into four interrelated domains: Theory, Context, Characteristics, and Methodology (see Fig. 5).

4.2.1 Theory (T)

Three dominant theoretical frameworks emerge: dynamic capabilities (Teece et al. 1997), strategic leadership theory (Judge et al. 2009), and sustainability via circular economy. Dynamic capabilities are the most widely applied, providing a foundation for understanding how SMEs sense and seize opportunities and reconfigure resources amid uncertainty. For example, Conz et al. (2023) and Anwar et al. (2023) illustrate how SMEs develop resilience through continuous learning and process experimentation, particularly during crisis periods.

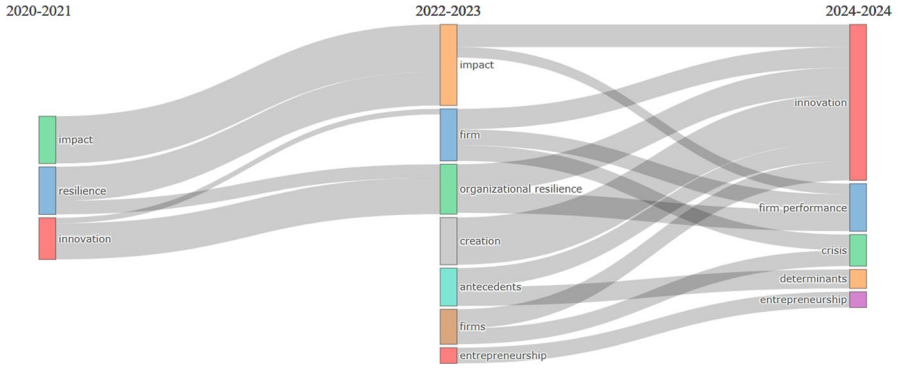

Fig. 5 Evolution of the topic. Source: Author (2025)

Strategic leadership theory also plays a critical role, as leadership vision, emotional intelligence, and decision-making are consistently linked to organizational resilience (Kunz and Sonnenholzner 2023; Ramli et al. 2023). These traits influence how firms mobilize resources, build adaptive cultures, and respond to external shocks (see Table 3).

The integration of circular economy practices further enhances theoretical plurality. Studies such as Al-Omoush et al. (2024) and Müller et al. (2024) show that sustainability and eco-innovation improve SMEs' long-term resilience by reducing dependency on fragile supply chains and aligning with social and environmental objectives.

4.2.2 Context (C)

Geographical and industrial diversity strongly shape resilience strategies. Much of the literature focuses on SMEs in developed economies with well-established institutions and infrastructure (Hillmann 2021; Napier et al. 2024). However, studies from emerging markets such as Ghana, India, and Pakistan (Essuman et al. 2023; Anwar et al. 2023) emphasize the roles of informal institutions, limited support structures, and socio-political instability (see Table 4).

Industrially, research spans manufacturing, retail, and digital sectors. The emergence of global value chains (GVCs) as both enablers and vulnerabilities is a recurrent theme (Gereffi et al. 2022). SMEs embedded in GVCs often face downstream risk from dominant buyers and upstream disruptions from logistical failures. Studies by Roffia and Dabić (2024) and Ori et al. (2024) highlight how digital transformation acts as a risk buffer, enhancing real-time decision-making and supply chain flexibility.

Other sectoral contexts—such as sports entrepreneurship (González-Serrano et al. 2023) and co-working ecosystems (Wei et al. 2024)—demonstrate how ecosystemic and peer-level interactions also shape resilience. These contexts demand new theoretical lenses that capture both macro volatility and micro adaptability (see Fig. 6).

Table 3 Theories cluster. Source: (Author 2025)

Research question	Cluster	Theories	References
Overarching research question	Multi-level resilience perspectives	Multilevel resilience framework, resilience theory, normative resilience, institutional logics, micro- and macro-level resilience frameworks, organizational theory	Su and Junge (2023), Galkina et al. (2023), Avioutskii and Roth (2024), Gianiodis et al. (2022), Wang et al. (2024a, b, c), Leonelli et al. (2024)
	Leadership and behavioral strategies	Strategic leadership, emotional leadership strategies, entrepreneurial attitude, regulatory focus theory, psychological resilience, entrepreneurial identity theory	Judge et al. (2009), Ramli et al. (2023), Conz et al. (2023), Vershinina and Rodgers (2023), Hadjielias et al. (2022), Stevenson et al. (2024)
	Entrepreneurial and cognitive theories	Entrepreneurial bricolage, microfoundations, entrepreneurial opportunity recognition, cognitive frame theory	Jeong and Gong (2024), Agnihotri et al. (2023), Gur et al. (2020), Roloff (2023), Roundy and Im (2024)
	Paradoxes and ambidexterity	Ambidexterity, paradox perspective, paradoxical tension	Ammirato et al. (2024), Bettiol et al. (2023), Chaudhary et al. (2024), Gottschalck et al. (2024)
	Dynamic capabilities and resilience	Dynamic capabilities, absorptive capacity, generative capability, adaptive and absorptive resilience, business model transformation	Teece et al. (1997), Patel et al. (2023), Roffia and Dabic (2024), Magnani et al. (2024), Teruel-Sánchez et al. (2021), Razzak et al. (2023), Faiz et al. (2024), Grego et al. (2024), Corvello et al. (2024), Wang et al. (2024a, b, c)
	Digital transformation and innovation	Digitalization strategies, digital resilience, digital corporate social responsibility, knowledge transfer theory, intellectual capital theory	Sinha et al. (2024), Al-Omoush et al. (2024), Roffia and Dabic (2024), Wang et al. (2024a, b, c), Razavi Hajiagha et al. (2024), Shih and Lin (2022)
	Sustainability and circular economy	Circular economy, sustainability strategies	Le et al. (2023), Ammirato et al. (2024), González-Serrano et al. (2023)
	Organizational learning	Learning theory approach, holistic entrepreneurial learning, organizational learning from crisis	Kromidha and Bachtiar (2024), Lattacher et al. (2024), Lefebvre and Osei-Tutu (2024)
	Inter-organizational collaboration	Stakeholder engagement, bridging organizational logics, hybridity, social legitimacy, value co-creation	Santoro et al. (2020a, b), Bonomi et al. (2020), Wei et al. (2024), Darendeli et al. (2021), Kano et al. (2022)
	Institutional and embedded theories	Embeddedness theory, institutional work, planning for adversity, institutional voids	Campagnolo et al. (2022), Bonomi et al. (2020), Onjewu et al. (2023)
	Crisis and event theories	Event system theory, crisis preparedness, dynamic process model	Lu and Zhou (2024), Klyver and Nielsen (2024), Napier et al. (2024)
	Innovation ecosystem theories	Venture capital-driven innovation ecosystem, strategic orientation, embedded ecosystems	Kotsopoulos et al. (2022), Gianiodis et al. (2022), González-Serrano et al. (2023)

Table 4 Contextual cluster. Source: (Author 2025)

Research question	Context	Cluster	References
Overarching research question	Multinational enterprises, SMEs globally, entrepreneurial ecosystems, Italian SMEs, emerging economies, and organizations navigating complex global challenges	Studies examining multilevel resilience frameworks and interactions among individual, organizational, and inter-organizational resilience-building processes	Su and Junge (2023), Conz et al. (2023), Leonelli et al. (2024), Napier et al. (2024), Magnani et al. (2024), Roffia and Dabic (2024), Greene and Rosiello (2020), Wang et al. (2024a, b, c), Tagliazucchi et al. (2023), Galkina et al. (2023), Santoro et al. (2021)
	UK micro-multinational firms, ethnic entrepreneurs in the UK, Italian wineries, small firms navigating COVID-19, and high-growth entrepreneurs during global crises	Focus on leadership traits, cognitive frameworks, entrepreneurial attitudes, and emotional intelligence in driving resilience strategies. Includes studies on adaptive behaviors and decision-making	Agnihotri et al. (2023), Jeong and Gong (2024), Lattacher et al. (2024), Ramli et al. (2023), Stevenson et al. (2024), St-Jean et al. (2023), Ho and Teo (2022), Santoro et al. (2020a, b), Darendeli et al. (2021), Vershinina and Rodgers (2023), Casprini et al. (2023), Gur et al. (2020), Patel et al. (2023), Liu et al. (2023), Lewellyn et al. (2024), Roundy and Im (2024)
	Italian manufacturing firms, SMEs navigating COVID-19 globally, digital entrepreneurs in Germany, knowledge-intensive enterprises, and SMEs in emerging economies	Studies on organizational processes, including resource optimization, digitalization, innovation, and cultural adaptation, foster resilience	Al-Omoush et al. (2024), Bettiol et al. (2023), Faiz et al. (2024), Razavi Hajiagha et al. (2024), Isensee et al. (2023), Klyver and Nielsen (2024), Grego et al. (2024), Magnani et al. (2024), Müller et al. (2024), Ori et al. (2024), Sharma et al. (2024a, b), Sinha et al. (2024), Liu et al. (2023), Santoro et al. (2021), Leonelli et al. (2024), Conz et al. (2023), Roffia and Dabic (2024), Corvello et al. (2024)
	Global value chains, Turkish multinational enterprises, SMEs in North Africa, and inter-organizational collaborations in developed and emerging markets	Focus on inter-organizational relationships, such as collaborations, partnerships, and global value chains. This includes resource sharing, trust, and digital platforms for coordination	Ammirato et al. (2024), Buyukbalci et al. (2024), Campagnolo et al. (2022), Darendeli et al. (2021), Essuman et al. (2023), González-Serrano et al. (2023), Kano et al. (2022), Magnani et al. (2024), Onjewu et al. (2023), Roffia and Dabic (2024), Su and Junge (2023), Wang et al. (2024a, b, c), Zhang et al. (2024), Luo (2022), Luo et al. (2024), Puhr and Muellber (2022), Williams and Shepherd (2021)

4.2.3 Characteristics (C)

Three firm-level characteristics dominate resilience research: leadership adaptability, organizational practices, and external networks. Leadership is consistently portrayed as a driver of resilience (Casprini et al. 2023; Santoro et al. 2021), especially among SMEs led by women or family entrepreneurs. Such leaders often pursue proactive strategies that fuse emotional sensitivity with entrepreneurial risk-taking.

Organizational practices—including digitalization, resource frugality, and innovation—form the structural basis of resilience (Warner and Wäger 2019; Feliciano-Cestero et al. 2023; Sinha et al. 2024; Wang et al. 2024a, b, c). These internal routines

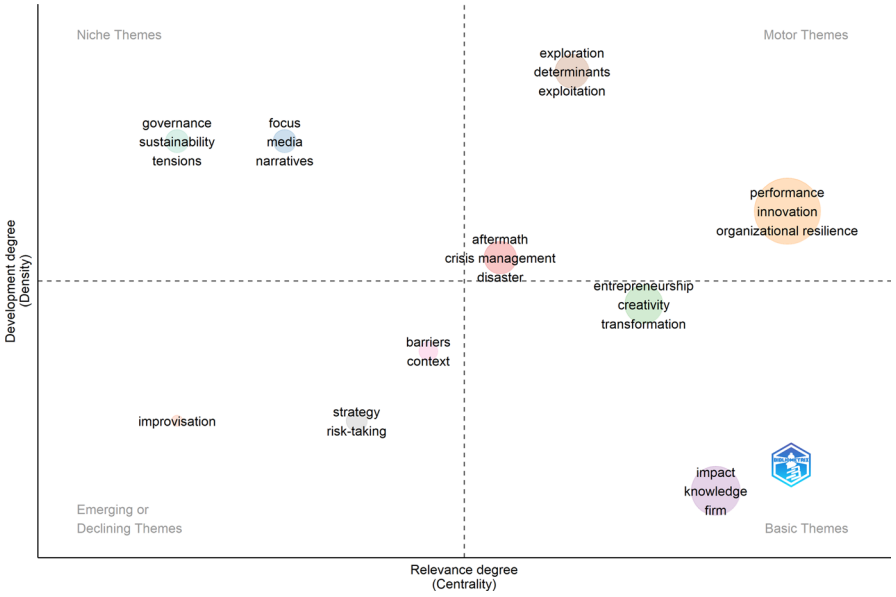

Fig. 6 Themes development and relevance. Source: Author (2025)

enable firms to absorb shocks, reallocate resources, and recalibrate strategies under stress (see Table 5).

Inter-organizational collaboration is also a core enabler of resilience. Kano et al. (2022) show that SMEs build resilience through alliances, supplier partnerships, and knowledge sharing. These ties allow access to critical resources and shared learning during crises, in tightly coupled global networks (see Fig. 7).

4.2.4 Methodology (M)

Resilience research employs a variety of methodologies. Qualitative approaches, particularly longitudinal case studies- are well-suited to capturing the evolution of resilience over time (Bonomi et al. 2020; Campagnolo et al. 2022). These studies offer deep insights into the cognitive and behavioral shifts in SME leaders and employees during disruptions (Ramli et al. 2023). Quantitative studies, often using regression and structural equation modeling, focus on correlating organizational traits (e.g., innovation, leadership) with resilience outcomes (Santoro et al. 2020a, b; Al-Omoush et al. 2024). While this offers generalizability, they often lack explanatory richness (see Fig. 8).

Mixed-method designs and advanced techniques such as fuzzy set qualitative comparative analysis (fsQCA) are gaining popularity, allowing for analysis of complex causality and cross-level interactions (González-Serrano et al. 2023; Wei et al. 2024). However, there remains a need for more experimental, simulation-based, and machine-learning methodologies to enhance the predictive and prescriptive power of resilience research (Ivanov and Dolgui 2021; Mariani et al. 2023).

Table 5 Characteristics cluster. Source: (Author 2025)

Research question	Cluster	Characteristics	References
Overarching research question	Leadership traits and adaptability	Leadership traits, global mindset	Agnihotri et al. (2023), Casprini et al. (2023), Ho and Teo (2022), Jeong and Gong (2024), Lewellyn et al. (2024)
	Leadership resilience	Personal and leadership resilience dynamics	Hadjielias et al. (2022), Lattacher et al. (2024), Stevenson et al. (2024), St-Jean et al. (2023)
	Organizational innovation and digitalization	Digital transformation, social entrepreneurship	Al-Omoush et al. (2024), Razavi Hajiagha et al. (2024), Isensee et al. (2023), Ori et al. (2024), Sinha et al. (2024)
	Organizational sustainability and partnerships	Sustainability strategies, asymmetric partnerships	Ammirato et al. (2024), Buyukbalci et al. (2024), Magnani et al. (2024), Müller et al. (2024), Grego et al. (2024)
	Resourcefulness and entrepreneurship	Slack resources, entrepreneurial mindset	Conz et al. (2023), Leonelli et al. (2024), Ramli et al. (2023)
	Capital-based resilience	Static vs. dynamic resilience based on capital resources	de Brito et al. (2022), Patel et al. (2023)
	Innovation through resource optimization	Tangible and intangible resources, innovation	Corvello et al. (2024), Klyver and Nielsen (2024), Kotsopoulos et al. (2022)
	Adaptive organizational practices	Exploration and exploitation, strategic adaptability	Bettiol et al. (2023), Gottschalck et al. (2024), Patel et al. (2023), Nikiforou et al. (2023)
	Cultural adaptability and agility	Agility, intrapreneurial culture	Buyukbalci et al. (2024), Sharma et al. (2024a, b), Shih and Lin (2022), Simms et al. (2022)
	Collaborative resilience	Hybridity, co-creation-based resilience	Bonomi et al. (2020), González-Serrano et al. (2023), Essuman et al. (2023), Williams and Shepherd (2021)
	Stakeholder and social resilience	Stakeholder engagement, psychological recovery	Gur et al. (2020), Roundy and Im (2024), Santoro et al. (2020a, b), Roloff (2023)
	Organizational legitimacy	Social legitimacy, market and nonmarket strategies	Darendeli et al. (2021), Luo (2022), Zhang et al. (2024)
	Entrepreneurial resilience	Opportunity confidence, slack resources, networks	Nikiforou et al. (2023), Leonelli et al. (2024), Razzak et al. (2023), Kromidha and Bachtiar (2024)
	Strategic resource deployment	Structural network, resource deployment	Campagnolo et al. (2022), Lefebvre and Osei-Tutu (2024), Nikiforou et al. (2023)
	Sustainability and ethical practices	Organizational values, ESG practices	Avioutskii and Roth (2024), Darendeli et al. (2021), Vershinina and Rodgers (2023), Wang et al. (2024a, b, c)
	Digital resilience	Digital resilience	Razavi Hajiagha et al. (2024), Ori et al. (2024), Sinha et al. (2024)

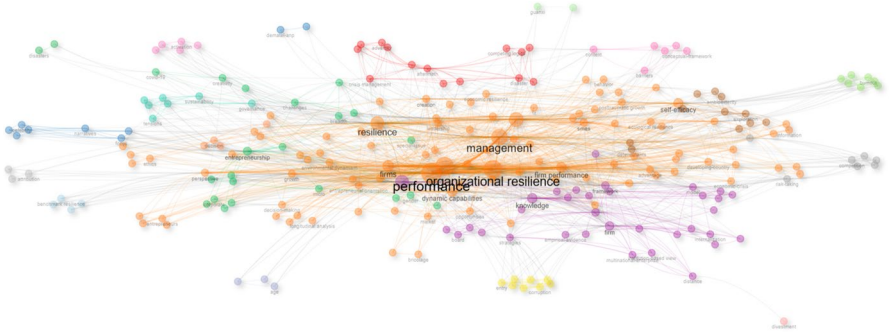

Fig. 7 Network of keywords based on bibliographic data. Source: Author (2025)

Fig. 8 WordCloud of bibliometric analysis. Source: Author (2025)

Together, the bibliometric and TCCM-based findings underscore the fragmented yet rapidly maturing nature of SME resilience research (see Table 6). While dominant theories and clusters are emerging, opportunities remain to integrate underexplored geographies, underrepresented sectors, and innovative methods. This hybrid approach not only enhances theoretical clarity and contextual sensitivity but also offers practical implications for SMEs and policymakers navigating crises in an uncertain world.

5 Discussion

5.1 Multilevel integration of SME resilience

This review reveals that resilience in SMEs is not a monolithic concept but an emergent property shaped by the dynamic interplay across individual, organizational, and inter-organizational levels. At the micro-level, individual leadership traits—particularly adaptability, emotional intelligence, and cognitive flexibility—play a foundational role in interpreting crises and mobilizing responses (Agnihotri et al. 2023;

Table 6 Methodology cluster. Source: (Author 2025)

Research questions	Methodology	Justification and rigor	References
Overarching research question	Bibliometric analysis	Provides a systematic overview of resilience literature to map thematic trends and gaps	Sharma et al. (2024a, b)
	Conceptual framework development	Helps build integrative models linking multi-level resilience factors, leveraging theoretical constructs	Luo (2022), Li (2020), Napier et al. (2024), Magnani et al. (2024)
	Time-lagged multi-level study	Allows dynamic exploration of resilience evolution in SMEs, addressing causality and temporal dimensions	Anwar et al. (2023)
	Structural equation modeling (SEM)	Ensures rigor by statistically validating relationships among resilience-related constructs at different levels	Leonelli et al. (2024), Santoro et al. (2020a, b), Santoro et al. (2021)
	Multiple case study methodology	Offers contextual richness and cross-case comparisons to explore resilience-building mechanisms	Conz et al. (2023), Galkina et al. (2023)
	Grounded theory interviews	Builds theory from empirical data, focusing on the lived experiences of entrepreneurs	Isensee et al. (2023)
	Interpretative phenomenological analysis	Enables a nuanced understanding of how failed entrepreneurs develop resilience	Lattacher et al. (2024)
	Gioia methodology	Provides structured qualitative insights into ethnic minority entrepreneurs' resilience strategies	Razzak et al. (2023)
	Within-person field study, experience sampling	Captures micro-level, daily entrepreneurial actions that influence resilience outcomes	Stevenson et al. (2024)
	Longitudinal study of 35 owner-managers	Offers insights into the sustained dynamics of leadership resilience during crises	Hadjielias et al. (2022)
	fsQCA analysis	Captures complex configurations of individual-level factors (e.g., traits and leadership) influencing resilience	Lewellyn et al. (2024), González-Serrano et al. (2023), Wei et al. (2024), Zhang et al. (2024)
	PLS-SEM, structural modeling	Quantitatively models relationships between digital transformation and resilience, ensuring validity and reliability	Al-Omoush et al. (2024), Baier-Fuentes et al. (2023), Teruel-Sánchez et al. (2021)
	Multivariate regression	Explores factors such as ERP systems and management controls influencing resilience-building	Roffia and Dabic (2024)

Table 6 (continued)

Research questions	Methodology	Justification and rigor	References
	Survey, regression analysis	Validates resilience mechanisms statistically across a large sample of SMEs	Agnihotri et al. (2023), Essuman et al. (2023), Onjewu et al. (2023), Faiz et al. (2024), Ori et al. (2024)
	Longitudinal survey	Tracks SMEs' adaptation strategies over time, offering temporal depth to resilience research	Lefebvre and Osei-Tutu (2024)
	Resilience path analysis	Combines quantitative surveys and resilience-specific metrics to identify pathways of adaptation	Grego et al. (2024)
	Uncertain MCDM analysis using DEMATEL-ANP	Incorporates multi-criteria decision-making to assess SME digital resilience capabilities	Razavi Hajiagha et al. (2024)
	Case study approach	Offers rich, in-depth exploration of resilience in specific organizational contexts such as SMEs and startups	Bettiol et al. (2023), Simms et al. (2022), Darendeli et al. (2021)
	Qualitative Comparative Analysis (QCA), fsQCA	Identifies patterns of inter-organizational collaboration and their outcomes in resilience	Wang et al. (2024a, b, c), González-Serrano et al. (2023), Wei et al. (2024), Zhang et al. (2024)
	Longitudinal study with interviews	Explores how inter-organizational collaborations evolve to sustain resilience in crises	Bonomi et al. (2020), Hadjielias et al. (2022)
	Survey of 900 immigrant-led SMEs	Validates resilience strategies in immigrant-owned SMEs within diverse global value chains	Campagnolo et al. (2022)
	Conceptual framework, multilevel analysis	Synthesizes multi-level insights into how SMEs leverage external partnerships to build resilience	Roundy and Im (2024), Napier et al. (2024)
Additional methodologies	Quantitative analysis	Employs rigorous statistical techniques to model investment sensitivities and venture resilience	Patel et al. (2023)
	Qualitative content analysis	Provides in-depth insights into stakeholder dynamics influencing resilience in Gulf Coast SMEs	Gur et al. (2020)
	Innovative methods (DEMATEL-ANP)	Advanced modeling of multi-dimensional resilience in digital environments	Razavi Hajiagha et al. (2024)
	Cross-disciplinary reviews	Combines insights across disciplines to propose integrative resilience frameworks	Gianiodis et al. (2022)

Anwar et al. 2023). Leaders exhibiting a *tertius iungens* orientation are particularly effective in bridging organizational silos, aligning stakeholder interests, and fostering network-based resilience (Faiz et al. 2024; Al-Omoush et al. 2024). However, cognitive biases such as overconfidence or optimism bias can compromise decision quality under uncertainty, exposing firms to elevated risk (Casprini et al. 2023; Kunz and Sonnenholzner 2023).

At the meso-level, these individual traits are instantiated through adaptive organizational routines. SMEs with embedded dynamic capabilities—especially those facilitating sensing, seizing, and reconfiguring—demonstrate greater agility in volatile environments (Warner and Wäger 2019; Roffia and Dabić, 2024). Resource-constrained SMEs often adopt frugal innovation models and lean practices to optimize resilience under high uncertainty (Bettiol et al. 2023; Grego et al. 2024).

At the macro-level, inter-organizational configurations such as GVC participation, digital ecosystems, and collaborative networks significantly mediate resilience. Trust-based supply chain relationships enable information sharing, risk pooling, and joint contingency planning (Gereffi 2020; Kano et al. 2022; Malik 2019, 2021). SMEs embedded in such networks are better positioned to absorb shocks, provided they can navigate power asymmetries and assert influence through relational capital (Campagnolo et al. 2022; Humphrey 2021).

Importantly, these levels are mutually reinforcing. Leadership influences organizational agility, which in turn facilitates greater absorptive capacity within inter-firm ecosystems. Resilience mechanisms thus operate as recursive feedback loops rather than linear responses (Magnani et al. 2019, 2024; Napier et al. 2024).

5.2 The role of digital technologies

Digitalization emerges as a cornerstone of resilient transformation. Technologies such as AI, blockchain, cloud computing, and big data analytics facilitate real-time visibility, predictive insights, and distributed decision-making (Warner and Wäger 2019; Roffia and Dabić, 2024; Sinha et al. 2024). These tools support both anticipatory and responsive resilience by optimizing resource flows, shortening lead times, and enabling remote coordination.

However, barriers to digital adoption persist. Many SMEs—particularly in emerging economies—face limitations in infrastructure, digital literacy, and financial resources (Lefebvre and Osei-Tutu 2024; Razavi Hajiagha et al. 2024). In such contexts, digital transformation is often incremental and path-dependent. Nonetheless, SMEs that overcome these constraints report substantial improvements in supply chain visibility, customer engagement, and strategic planning (Feliciano-Cestero et al. 2023; González-Serrano et al. 2023; Grego et al. 2024).

Digital technologies also enhance the tertius iungens role of entrepreneurial leaders by enabling more inclusive and transparent stakeholder coordination (Faiz et al. 2024; Napier et al. 2024). However, the interplay between digital tools and organizational culture remains underexplored, particularly the soft elements such as trust, psychological safety, and learning orientation that mediate successful technology assimilation.

5.3 Global value chains and networked resilience

Participation in GVCs offers both resilience-enhancing opportunities and systemic vulnerabilities. On the one hand, GVCs provide access to global knowledge, markets, and supplier networks. On the other hand, they expose SMEs to cascading disruptions, compliance burdens, and power asymmetries (Gereffi 2020; Kano et al. 2022). SMEs often bear the brunt of risk without commensurate influence over governance or coordination mechanisms (Humphrey 2021).

To mitigate these risks, resilient SMEs employ diversification strategies, localize key functions, and invest in traceability tools (Luo et al. 2024; Roffia and Dabić, 2024). Relational capital becomes vital: firms that cultivate trust-based partnerships are better able to co-create resilience plans, negotiate equitable contracts, and secure more stable positions within supply chains (Corvello et al. 2024; Darendeli et al. 2021).

Also, digital capabilities enhance this networked resilience by offering real-time monitoring, collaborative platforms, and scenario modeling (González-Serrano et al. 2023; Feliciano-Cestero et al. 2023; Napier et al. 2024). Building on the baseline multilevel framework presented in Fig. 1, Fig. 9 introduces a *process-oriented roadmap* that explains how organizational resilience unfolds over time. Whereas Fig. 1 provides a descriptive structuring of the individual, organizational, and inter-organizational levels at which resilience is situated, Fig. 9 conceptualizes the *dynamic metamorphosis* through which SMEs transition from reactive and adaptive responses toward *transformative resilience*. The roadmap explicitly visualizes this evolution through *bidirectional cross-level interactions and recursive feedback loops*, highlighting resilience as an *emergent and continuously evolving process* rather than a linear sequence.

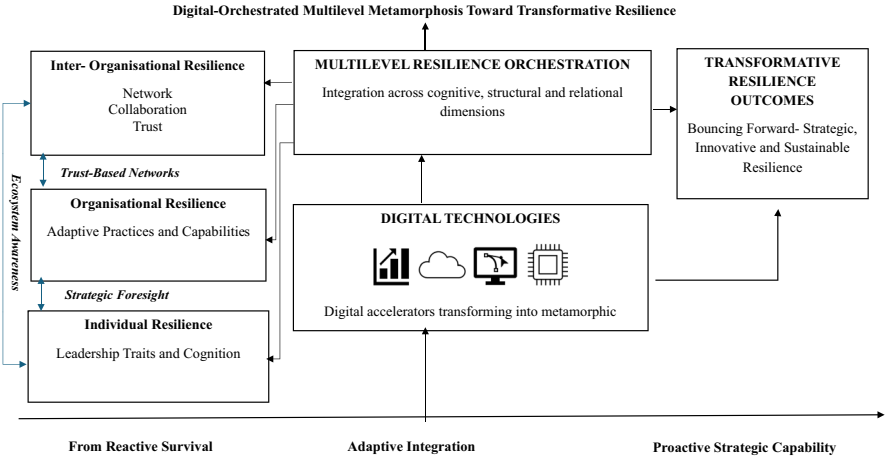

Fig. 9 Multilevel roadmap toward transformative resilience: from crisis response to strategic renewal digital-orchestrated multilevel metamorphosis toward transformative resilience. Source: Authors (2026)

Within this roadmap, *digital orchestration* plays a central enabling role by accelerating the alignment of leadership cognition, organizational reconfiguration, and inter-organizational trust. Strategic foresight at the individual level informs organizational reconfiguration, organizational capabilities enable coordinated action across networks, and inter-organizational learning feeds back into managerial sensemaking. Through these recursive interactions, SMEs progressively reframe uncertainty, reconfigure business models, and reposition themselves within evolving ecosystems.

Transformative resilience, as conceptualized in this review, denotes the *end-state of this multilevel metamorphosis*, in which SMEs move beyond short-term crisis absorption toward *strategic renewal and reorientation*. Consistent with resilience scholarship emphasizing temporal sequencing and renewal pathways (Hillmann 2021; Malik 2021; Wenzel et al. 2021), transformative resilience reflects a *bouncing-forward* logic in which disruption becomes a catalyst for innovation, capability recombination, and long-term value creation. Importantly, transformative resilience is *not synonymous with digital transformation*; rather, it is accelerated when digital infrastructure, data analytics, and platform-based coordination interact with adaptive leadership and trust-based network relationships. In this way, our proposed conceptual model synthesizes the study's core contribution by depicting resilience as a *dynamic, multilevel, and strategically oriented capability.*

6 Future research agenda: toward a multilevel and multidimensional understanding of SME resilience

The synthesis of bibliometric analysis and systematic literature review reveals the fragmented yet rapidly evolving nature of SME resilience research. Each subsection offers a focused direction for scholars, practitioners, and policymakers.

6.1 Advancing theoretical integration and cross-level models

A central finding of this study is the theoretical dispersion across dominant frameworks, including dynamic capabilities (Teece et al. 1997), institutional theory (Luo et al. 2022), stakeholder theory (Al-Omoush et al. 2024), and the resource-based view (Barney 1991). While these theories have yielded valuable insights, their siloed application limits explanatory coherence. Future research should emphasize theoretical integration to capture the interplay of structural, behavioral, and contextual factors.

Particularly promising is the incorporation of cognitive and behavioral theories into resilience studies. Research should explore how decision-making biases, heuristics, and cognitive framing influence SME responses to crises (Bönte et al. 2024; Powell et al. 2011; Kunz and Sonnenholzner 2023). Emphasizing bounded rationality and psychological resilience can deepen our understanding of how entrepreneurs process risk and navigate uncertainty (Hillmann 2021; Onjewu et al. 2023).

Moreover, the concept of *tertius iungens*—the act of bridging disconnected social groups—offers a fruitful avenue for investigating networked resilience. As noted by Casprini et al. (2023) and illustrated in Fig. 9, leaders who enact this role can enhance

relational capital and strategic alignment in turbulent environments. Future studies should empirically test how this orientation interacts with digital capabilities and agility at multiple organizational levels.

6.2 Expanding contextual boundaries: geographies, sectors, and institutional complexity

A recurring theme in the literature is the dominance of research from high-income, politically stable countries, with scant attention to SMEs in emerging markets, fragile states, or conflict zones. This limits the global relevance of existing findings. Future research should prioritize resilience in underexplored contexts where regulatory voids, infrastructural weaknesses, and socio-political instability shape entrepreneurial behavior (Hillmann 2021; Le et al. 2023).

Additionally, resilience scholarship is heavily concentrated in manufacturing and ICT sectors, with limited attention to tourism, agriculture, health services, and creative industries—sectors that are highly sensitive to exogenous shocks. Studies such as González-Serrano et al. (2023) and Roffia and Dabić (2024) highlight unique resilience strategies in service sectors, suggesting that industry-specific insights are crucial for understanding contextual nuances.

Figure 9 further highlights the need to study resilience as a cross-sectoral and ecosystemic phenomenon in which firms co-create adaptive responses with institutional actors. Such an approach may benefit from concepts like institutional bricolage, informal governance, and co-regulation.

6.3 Deepening analysis of organizational microfoundations

At the firm level, greater attention must be paid to leadership diversity and organizational identity as determinants of resilience. Despite emerging work on gender and ethnicity (Casprini et al. 2023), most studies treat firms as homogenous entities. Future research should investigate how diverse leadership configurations influence risk perception, relational strategies, and digital adaptation.

The influence of national culture also deserves deeper examination. Dimensions such as uncertainty avoidance, collectivism, and power distance affect how SMEs make strategic decisions and form alliances during crises (Florez-Jimenez et al. 2024; Luo et al. 2022). These cultural moderators should be explicitly modeled in future studies, particularly in cross-country comparative designs.

As illustrated in Fig. 9, firm-level characteristics such as agility, innovation orientation, and relational capital interact dynamically with digital infrastructure and leadership practices. These interactions form the foundation of emergent strategic responses, underscoring the need for granular, firm-specific analyses that reflect real-world complexity.

6.4 Methodological advancements: from static snapshots to dynamic mapping

Methodological homogeneity is a critical limitation in resilience research. The field is still largely reliant on cross-sectional surveys and retrospective case studies, which

offer limited temporal insight. Building on calls by Ivanov and Dolgui (2021) and Di Prima et al. (2024), future research should adopt longitudinal designs, event-history models, and computational techniques such as machine learning and simulation modeling.

Mixed methods designs that combine qualitative depth with quantitative generalizability can enhance theory building and contextual understanding. Real-time data drawn from IoT systems, digital platforms, or web-scraping tools can also enrich analysis by capturing evolving organizational responses during disruption cycles (Wang et al. 2024a, b, c).

Furthermore, process-tracing techniques and comparative historical analysis can uncover how routines, leadership decisions, and adaptive strategies shift across pre-, during-, and post-crisis phases (Chatterjee et al. 2023; Williams et al. 2017). These methods can be beneficial for examining the recursive nature of resilience capabilities, moving beyond static trait-based models.

6.5 Implications for practice: navigating disruption through strategic foresight, digital agility, and network orchestration

Organizational resilience in SMEs should not be understood as a function of internal slack resources or ad hoc contingency planning alone, but rather as a *dynamic, multilevel orchestration of strategic foresight, digital infrastructure, and trust-based relational networks*. From a practitioner perspective, this integrative model provides a diagnostic and action-oriented lens through which SME leaders can assess their resilience posture and identify leverage points for strategic renewal rather than mere survival (Hillmann 2021; Conz and Magnani 2020; Wenzel et al. 2021).

At the individual and organizational interface, the findings highlight the central role of *adaptive leadership and managerial cognition* in shaping resilient responses to disruption. SME managers are encouraged to cultivate leadership capabilities that support experimentation, learning, and forward-looking sensemaking under uncertainty (Judge et al. 2009; Kunz and Sonnenholzner 2023). Strategic foresight—enabled through scenario planning, reflective decision processes, and cognitive flexibility—allows leaders to anticipate discontinuities and reposition the firm proactively rather than reactively (Seong et al. 2024; Malik 2019, 2021). Importantly, investments in digital transformation must be accompanied by targeted upskilling initiatives to ensure that data analytics, real-time monitoring, and rapid decision-making are meaningfully embedded in daily routines rather than remaining isolated technological upgrades (Warner and Wäger 2019; Isensee et al. 2023; Roffia and Dabić, 2024).

At the organizational and inter-organizational interface, resilience emerges through *network orchestration and relational capital development*, particularly for SMEs embedded in global value chains (GVCs). The findings suggest that SMEs should move beyond arm's-length transactional relationships and actively engage partners in joint risk-sharing, information exchange, and contingency coordination (Gereffi 2020; Kano et al. 2022). Here, the concept of *tertius iungens* is especially salient for practice, as it captures a relational leadership orientation focused on bridging disconnected actors, aligning interests, and enabling collaborative problem-solving in tur-

bulent environments (Obstfeld 2005; Agnihotri et al. 2023; Faiz et al. 2024). Leaders who enact this bridging role can enhance absorptive capacity, improve access to critical resources, and strengthen collaborative readiness across ecosystems—capabilities that are particularly valuable for resource-constrained SMEs facing asymmetric power relations in GVCs (Humphrey 2021; Campagnolo et al. 2022).

Taken together, the practical implication of the metamorphic resilience roadmap is that SME resilience should *be actively managed as a strategic process of alignment across cognition, digital capabilities, and relational structures*, rather than treated as a static outcome or emergency response (see Table 7). By integrating strategic foresight, digital agility, and network orchestration, SME leaders can move from short-term crisis absorption toward *transformative resilience,* enabling sustained adaptation, innovation, and strategic renewal under conditions of persistent uncertainty.

6.6 Implications for policy: creating enabling ecosystems for SME resilience

From a policy perspective, the need for institutional support mechanisms that go beyond reactive measures. Governments and development organizations must foster long-term resilience by promoting inclusive entrepreneurship, digital equity, and collaborative innovation networks.

Policy initiatives should support leadership diversity, especially among women and minority entrepreneurs, whose strategic choices often differ due to lived experience and network configurations. Similarly, interventions should target peripheral regions and conflict-affected areas, where institutional voids can be partially filled through hybrid governance models and public–private partnerships.

Table 7 Summary of thematic clusters and conceptual contributions across levels. Source: (Author 2026)

Level of analysis	Core themes (from clusters)	Key enablers	Conceptual contribution to resilience
Individual	Leadership traits, emotional intelligence, entrepreneurial cognition, resilience mindset (Tables 3 and 5)	Adaptive leadership, cognitive flexibility, learning orientation	Reframes resilience as a cognitive–behavioral capability shaping proactive sensemaking and strategic foresight under uncertainty
Organizational	Digital transformation, dynamic capabilities, innovation, sustainability practices (Tables 3, 5 and 6)	Digital infrastructure, absorptive capacity, process reconfiguration	Positions resilience as an organizational capability for adaptive reconfiguration, enabling agility beyond short-term crisis absorption
Inter-organizational	Collaboration, trust, global value chains, ecosystems, institutional embeddedness (Tables 3 and 4)	Relational capital, network orchestration, hybrid governance	Conceptualizes resilience as an ecosystem-level, relational phenomenon, emerging through coordinated action and trust-based networks
Multilevel integration	Metamorphosis across levels (Fig. 7)	Digital orchestration, strategic foresight, relational leadership	Advances resilience as a dynamic, metamorphic concept, evolving from reactive survival to transformative resilience

Table 8 Future research agenda. Source: (Author 2025)

Category	Research questions
How	How do cognitive biases and emotional intelligence influence resilience strategies in SMEs?
	How do cultural dimensions, such as collectivism, shape inter-organizational collaboration during crises?
	How can digital tools enhance SMEs' transparency and adaptability within global value chains?
	How does leadership diversity affect resilience outcomes across different crisis stages?
When	When do SMEs in emerging markets adopt informal networks for resilience, and why are they effective?
	When does digital transformation lead to the most significant improvements in organizational adaptability?
	When do longitudinal patterns emerge in SMEs' responses to successive disruptions?
	When do leadership styles vary in their effectiveness across cultural contexts?
Why	Why do SMEs in high-risk industries exhibit unique resilience mechanisms compared to low-risk sectors?
	Why do some SMEs in global value chains fail to adapt to power asymmetries?
	Why are cross-cultural comparisons critical to understanding resilience practices globally?
	Why do women-led SMEs demonstrate distinct resilience strategies?
What	What role do big data analytics and machine learning play in advancing resilience research?
	What contextual factors most significantly impact resilience in developing economies?
	What insights can mixed-method approaches provide that single-method studies cannot?
	What frameworks can integrate dynamic capabilities with behavioral theories for a holistic understanding?

National and regional policies must also support relational capital development—via accelerators, cluster programs, and inter-firm platforms—to facilitate knowledge exchange, joint problem-solving, and cross-sectoral resilience strategies. In this regard, integrating resilience indicators into SME support policies and funding criteria would align public goals with firm-level capability building.

6.7 Implications for research and knowledge diffusion

Table 8 provides a structured roadmap for future research that addresses theoretical gaps, contextual blind spots, and underutilized methodological approaches. Future studies should aim to triangulate data across levels and disciplines to produce more robust and generalizable insights.

Scholars are also encouraged to explore the emergent properties of resilience as dynamic capabilities, integrating insights from complexity theory, systems thinking, and platform ecosystems. Knowledge diffusion mechanisms, including translational research, open access data platforms, and cross-sectoral engagement—can enhance the real-world impact of academic work.

Finally, researchers should remain attuned to epistemic reflexivity, especially when using AI-augmented tools and large datasets. Transparent, replicable methods must be paired with context-sensitive interpretation to ensure that research contributes meaningfully to the evolving understanding of SME resilience in the face of global uncertainty.

7 Conclusion

This hybrid SLR demonstrates a paradigmatic shift in SME resilience scholarship—from reactive recovery toward strategic transformation. Moving beyond the traditional "bouncing back" paradigm, the field now emphasizes "bouncing forward" as firms adapt, learn, and evolve through disruption. Drawing on bibliometric mapping and the TCCM framework, this study reveals that SME resilience is a multilevel capabilities that emerges from dynamic interactions among individual agency, organizational capabilities, and inter-organizational ecosystems.

Leadership adaptability, digital transformation, and strategic collaboration form the triadic backbone of resilient SMEs, as visualized in Fig. 9. Leaders adopting tertius iungens behaviors—those who span boundaries and integrate knowledge—enable more robust network participation and agile decision-making (Faiz et al. 2024; Feliciano-Cestero et al. 2023; Al-Omoush et al. 2024). This fosters not only operational recovery but also strategic renewal. Theoretically, the review bridges dynamic capabilities with behavioral strategy and ecosystem views of resilience. Methodologically, it advocates for longitudinal, mixed-method, and AI-augmented approaches to trace the recursive development of resilience. Conceptually, it captures the metamorphosis of resilience (Fig. 9), marking a shift toward foresight, innovation, and socio-technical integration. In an era of cascading global shocks, this study equips researchers, practitioners, and policymakers with a robust roadmap for understanding and enhancing SME resilience as a dynamic, forward-looking capability.

Acknowledgements This research received no specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Funding Open Access funding enabled and organized by Projekt DEAL.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

References

Agnihotri A, Bhattacharya S, Jafari-Sadeghi V (2023) Combatting global disruption through tertius iungens orientation of CEOs: a moderated-mediated mechanism. J Int MAnag 29(5):101060

Al-Omoush K, Ribeiro-Navarrete B, McDowell WC (2024) The impact of digital corporate social responsibility on social entrepreneurship and organizational resilience. Manag Decis 62(8):2621–2640

Ammirato S, Felicetti AM, Filippelli S, Maran T (2024) Navigating paradoxical tension: the influence of big corporations on startup sustainability performance in asymmetric collaborations. Rev Manag Sci. https://doi.org/10.1007/s11846-024-00777-7

Ang S, Van Dyne L (2015) Handbook of cultural intelligence: Theory, measurement, and applications. Routledge, London

Antons D, Breidbach CF, Joshi AM, Salge TO (2023) Computational literature reviews: method, algorithms, and roadmap. Organ Res Methods 26(1):107–138

Anwar A, Coviello N, Rouziou M (2023) Weathering a crisis: a multi-level analysis of resilience in young ventures. Entrep Theory Pract 47(3):864–892

Aria M, Cuccurullo C (2017) Bibliometrix: an R-tool for comprehensive science mapping analysis. J Informetr 11(4):959–975

Aversa P, Bettinelli C, Levanti G, Mocciaro Li Destri A, Picone PM (2024) Leveraging intersections in management. J Manag Gov. https://doi.org/10.1007/s10997-024-09710-2

Avioutskii V, Roth F (2024) Doing business in Russia: normative organizational resilience, organizational identity and exit decisions. Manag Decis 62(5):1453–1472

Baier-Fuentes H, Andrade-Valbuena NA, Gonzalez-Serrano MH, Gaviria-Marin M (2023) Bricolage as an effective tool for the survival of owner-managed SMEs during crises. J Bus Res 157:113608

Barney J (1991) Firm resources and sustained competitive advantage. J Manage 17(1):99–120

Beckenbauer B, Bérubé V, Bettati A (2023) The state of organizations 2023

Bettiol M, Capestro M, Di Maria E, Micelli S (2023) Ambidextrous strategies in turbulent times: the experience of manufacturing SMEs during the COVID-19 pandemic. Int J Phys Distrib Logist Manag 53(2):248–272

Bonomi S, Ricciardi F, Rossignoli C, Zardini A (2020) Cocreating resilient hybrids: the bridging power of social enterprises' organizational logics. Int J Entrep Behav Res 27(2):470–495

Bönte W, Procher VD, Malik FS (2024) Terror in the city: local terrorism and firm exports. BE J Econ Anal Policy 24(4):1073–1100

Breslin D, Gatrell C (2023) Theorizing through literature reviews: the miner-prospector continuum. Organ Res Methods 26(1):139–167

Buyukbalci P, Sanguineti F, Sacco F (2024) Rejuvenating business models via startup collaborations: evidence from the Turkish context. J Bus Res 174:114521

Campagnolo D, Laffineur C, Leonelli S, Martiarena A, Tietz MA, Wishart M (2022) Stay alert, save businesses. Planning for adversity among immigrant entrepreneurs. Int J Entrep Behav Res 28(7):1773–1799

Casprini E, Pucci T, Zanni L (2023) From growth goals to proactive organizational resilience: first evidence in women-led and non-women-led Italian wineries. Rev Manag Sci 17(3):1017–1036

Chatterjee S, Mariani M, Ferraris A (2023) Digitalization of supply chain and its impact on cost, firm performance, and resilience: technology turbulence and top management commitment as moderator. IEEE Trans Eng Manag 71:10469–10484

Chaudhary S, Dhir A, Meenakshi N, Christofi M (2024) How small firms build resilience to ward off crises: a paradox perspective. Entrep Reg Dev 36(1–2):182–207

Conz E, Magnani G (2020) A dynamic perspective on the resilience of firms: a systematic literature review and a framework for future research. Eur Manage J 38(3):400–412
Conz E, Magnani G, Zucchella A, De Massis A (2023) Responding to unexpected crises: the roles of slack resources and entrepreneurial attitude to build resilience. Small Bus Econ 61(3):957–981
Corvello V, Felicetti AM, Troise C, Tani M (2024) Betting on the future: how to build antifragility in innovative start-up companies. Rev Manag Sci 18(4):1101–1127
Cuervo-Cazurra A, Gaur A, Singh D (2019) Pro-market institutions and global strategy: the pendulum of pro-market reforms and reversals. J Int Bus Stud 50:598–632
Darendeli I, Hill TL, Rajwani T, Cheng Y (2021) Surviving the Arab Spring: socially beneficial product portfolios and resilience to political shock. Multinatl Bus Rev 29(4):522–544
De Brito RP, Lenz AK, Pacheco MGM (2022) Resilience building among small businesses in low-income neighborhoods. J Small Bus Manag 60(5):1166–1201
Denyer D, Parry E, Flowers P (2011) Social",“Open” and “Participative”? Exploring personal experiences and organisational effects of enterprise2. 0 use. Long Range Plann 44(5–6):375–396
Derviş H (2019) Bibliometric analysis using bibliometrix an R package. J Scientometr Res 8(3):156–160
Di Prima C, Cepel M, Kotaskova A, Ferraris A (2024) Help me help you: how HR analytics forecasts foster organizational creativity. Technol Forecast Soc Change 206:123540
Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM (2021) How to conduct a bibliometric analysis: an overview and guidelines. J Bus Res 133:285–296
Essuman D, Owusu-Yirenkyi D, Afloe WT, Donbesuur F (2023) Leveraging foreign diversification to build firm resilience: a conditional process perspective. J Int Manag 29(6):101090
European Commission: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Annual report on European SMEs 2024/2025 – SME performance review 2024/2025, Publications Office of the European Union, 2025,https://doi.org/10.2760/7714438
Faiz M, Sarwar N, Tariq A, Dias Jordão RV, Memon MA (2024) Strategic human capital analytics and new venture performance: role of dual nationality founding member. J Intellect Cap 25(7):151–175
Feliciano-Cestero MM, Ameen N, Kotabe M, Paul J, Signoret M (2023) Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization. J Bus Res 157:113546
Florez-Jimenez MP, Lleo A, Ruiz-Palomino P, Muñoz-Villamizar AF (2024) Corporate sustainability, organizational resilience, and corporate purpose: a review of the academic traditions connecting them. Rev Manag Sci. https://doi.org/10.1007/s11846-024-00735-3
Galkina T, Atkova I, Gabrielsson P (2023) Business modeling under adversity: resilience in international firms. Strateg Entrep J 17(4):802–829
Gereffi G (2020) What does the COVID-19 pandemic teach us about global value chains? The case of medical supplies. J Int Bus Policy 3(3):287–301
Gereffi G, Pananond P, Pedersen T (2022) Resilience decoded: the role of firms, global value chains, and the state in COVID-19 medical supplies. Calif Manage Rev 64(2):46–70
Gianiodis P, Lee SH, Zhao H, Foo MD, Audretsch D (2022) Lessons on small business resilience. J Small Bus Manage 60(5):1029–1040
Gkeredakis M, Lifshitz-Assaf H, Barrett M (2021) Crisis as opportunity, disruption and exposure: exploring emergent responses to crisis through digital technology. Inf Organ 31(1):100344
González-Serrano MH, Dos Santos MA, Sendra-Garcia J, Calabuig F (2023) Sports entrepreneurship during COVID-19: technology as an ally to maintain the competitiveness of small businesses. Technol Forecast Soc Change 187:122256
Gottschalck N, Branner K, Rolan L, Kellermanns F (2024) Cross-level effects of entrepreneurial orientation and ambidexterity on the resilience of small business owners. J Small Bus Manage 62(1):103–139
Greene FJ, Rosiello A (2020) Covid19: a commentary on the impacts of 'Great Lockdown'and its aftermath on scaling firms: What are the implications for entrepreneurial research? Int Small Bus J 38(7):583–592
Grego M, Magnani G, Denicolai S (2024) Transform to adapt or resilient by design? How organizations can foster resilience through business model transformation. J Bus Res 171:114359
Gruner RL, Minunno R (2024) Theorizing across boundaries: how to conduct a 'breakout'literature review. Int J Manage Rev 26(3):331–343
Gur FA, Bendickson JS, Madden L, McDowell WC (2020) Entrepreneurial opportunity recognition in the face of disasters. Int J Entrepreneur Behav Res 26(4):671–693
Hadjielias E, Christofi M, Tarba S (2022) Contextualizing small business resilience during the COVID-19 pandemic: evidence from small business owner-managers. Small Bus Econ 59(4):1351–1380

Hambrick DC, Mason PA (1984) Upper echelons: the organization as a reflection of its top managers. Acad Manage Rev 9(2):193–206
Hillmann J (2021) Disciplines of organizational resilience: contributions, critiques, and future research avenues. Rev Manag Sci 15:879–936
Ho M, Teo ST (2022) Activating collective agency in disrupted contexts: the social-cognitive context of ad hoc organising in a small and medium-sized enterprise. Int Small Bus J Res Entrepreneursh 40(2):273–304
Hoon C (2013) Meta-synthesis of qualitative case studies: an approach to theory building. Organ Res Methods 16(4):522–556
Humphrey J (2021) Global value chains and the COVID-19 pandemic: implications for development. World Dev 141:105414
Isensee C, Teuteberg F, Griese KM (2023) Success factors of organizational resilience: a qualitative investigation of four types of sustainable digital entrepreneurs. Manag Decis 61(5):1244–1273
Ivanov D, Dolgui A (2021) A review of disruption recovery in supply chains: a multi-level perspective. Int J Prod Econ 231:107970
Jeong I, Gong Y (2024) Time to get your hands dirty: bricolage or pro-organizational unethical response to entrepreneurial adversity. Asia Pac J Manage. https://doi.org/10.1007/s10490-024-09957-1
Judge TA, Piccolo RF, Kosalka T (2009) The bright and dark sides of leader traits: a review and theoretical extension of the leader trait paradigm. Leadersh Q 20(6):855–875
Kano L, Narula R, Surdu I (2022) Global value chain resilience: understanding the impact of managerial governance adaptations. Calif Manage Rev 64(2):24–45
Klyver K, Nielsen SL (2024) Preparedness shapes tomorrow: crisis preparedness and strategies among SMEs amid external crises. Entrep Reg Dev. https://doi.org/10.1080/08985626.2024.2352448
Kotsopoulos D, Karagianaki A, Baloutsos S (2022) The effect of human capital, innovation capacity, and COVID-19 crisis on knowledge-intensive enterprises' growth within a VC-driven innovation ecosystem. J Bus Res 139:1177–1191
Kraus S, Breier M, Dasí-Rodríguez S (2020) The art of crafting a systematic literature review in entrepreneurship research. Int Entrep Manag J 16:1023–1042
Kraus S, Jones P, Kailer N, Weinmann A, Chaparro-Banegas N, Roig-Tierno N (2021) Digital transformation: an overview of the current state of the art of research. SAGE Open 11(3):1–15
Kraus S, Mahto RV, Walsh ST (2023) The importance of literature reviews in small business and entrepreneurship research. J Small Bus Manag 61(3):1095–1106
Kraus S, Bouncken RB, Yela Aránega A (2024) The burgeoning role of literature review articles in management research: an introduction and outlook. Rev Manag Sci 18(2):299–314
Kromidha E, Bachtiar NK (2024) Developing entrepreneurial resilience from uncertainty as usual: a learning theory approach on readiness, response and opportunity. Int J Entrepreneurial Behav Res 30(4):1001–1022
Kunz J, Sonnenholzner L (2023) Managerial overconfidence: Promoter of or obstacle to organizational resilience? Rev Manag Sci 17:67–128
Lattacher W, Wdowiak MA, Schwarz EJ, Audretsch DB (2024) A holistic lens on entrepreneurial learning from failure: continuing the legacy of Jason Cope. Int J Entrepreneurial Behav Res 30(11):205–235
Le TT, Ferraris A, Dhar BK (2023) The contribution of circular economy practices on the resilience of production systems: Eco-innovation and cleaner production's mediation role for sustainable development. J Clean Prod. https://doi.org/10.1016/j.jclepro.2023.138806
Lefebvre V, Osei-Tutu F (2024) Better-prepared to face COVID-19: organizational learning from SMEs' experience with banking crises. J Small Bus Manag. https://doi.org/10.1080/00472778.2024.2397707
Leonelli S, Campagnolo D, Gianecchini M (2024) Entrepreneur and organizational resilience: a multilevel perspective on Italian SMEs. J Small Bus Manag. https://doi.org/10.1080/00472778.2024.2351483
Lewellyn KB, Falcon S, Moghaddam K (2024) Believing in climate change: help or hindrance for entrepreneurs' resilience? Entrep Reg Dev. https://doi.org/10.1080/08985626.2024.2310738
Li PP (2020) Organizational resilience for a new normal: balancing the paradox of global interdependence. Manag Organ Rev 16(3):503–509
Liu X, Yuan Y, Sun R, Zhao C, Zhao D (2023) Influence of entrepreneurial team knowledge conflict on ambidextrous entrepreneurial learning—a dual-path perspective of entrepreneurial resilience and fear of failure. J Innov Knowl 8(3):100389
Lu JW, Zhou X (2024) Disruptive events in strategy and international business research. Asia Pac J Manage 41(4):1797–1818

Luo Y (2021) A general framework of digitization risks in international business. J Int Bus Stud 53(2):344
Luo Y (2022) New connectivity in the fragmented world. J Int Bus Stud 53(5):962
Luo Y, Wu A, Liu Y, Song D (2024) The impact of long-term orientation on the resilience of niche leaders. Asia Pac J Manag. https://doi.org/10.1007/s10490-024-09977-x
Magnani G, De Massis A, Orazem R (2019) Strategic decision making in family firms: the role of family involvement and CEO overconfidence. J Fam Bus Strateg 10(4):100292
Magnani G, Sanguineti F, Cavusgil ST, Raskovic MM (2024) Developing resilience: multinational enterprise business model transformation to mitigate major disruptions. J Bus Res. https://doi.org/10.1016/j.jbusres.2024.114549
Malik FS, Terzidis O (2025a) A hybrid framework for creating artificial intelligence-augmented systematic literature reviews. Manag Rev Q. https://doi.org/10.1007/s11301-025-00522-8
Malik FS, Terzidis O (2025b) Thriving in turbulence: resilience and strategic adaptation in global business. Rev Manag Sci. https://doi.org/10.1007/s11846-025-00940-8
Malik FS (2019) Exploring the effects of terrorism on business operations firms in Pakistan and firms' response. In: Academy of Management Proceedings (Vol. 2019, No. 1, p. 19620). Briarcliff Manor, NY 10510: Academy of Management
Malik FS (2021) Terrorism, corporate performance and business strategies: presence, impact, and future (Doctoral dissertation, Dissertation, Wuppertal, Bergische Universität, 2021)
Mariani MM, Machado I, Magrelli V, Dwivedi YK (2023) Artificial intelligence in innovation research: a systematic review, conceptual framework, and future research directions. Technovation 122:102623
Marzi G, Balzano M, Caputo A, Pellegrini MM (2025) Guidelines for bibliometric-systematic literature reviews: 10 steps to combine analysis, synthesis and theory development. Int J Manag Rev 27(1):81–103
McKinsey & Company (2023) The state of organizations 2023. McKinsey & Company, Chicago
Merigó JM, Yang JB (2017) A bibliometric analysis of operations research and management science. Omega 73:37–48
Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMA Group*, T (2009) Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Ann Int Med 151(4):264–269
Müller M, Vaseková V, Kročil O, Kosina D (2024) COVID-19 as an advantage or a disaster? Crisis and change management strategies of Hong Kong social entrepreneurs during the pandemic. J Organ Chang Manag. https://doi.org/10.1108/jocm-02-2024-0101
Napier E, Liu SY, Liu J (2024) Adaptive strength: unveiling a multilevel dynamic process model for organizational resilience. J Bus Res 171:114334
Nikiforou A, Lioukas S, Chatzopoulou EC, Voudouris I (2023) When there is a crisis, there is an opportunity? SMEs' capabilities for durability and opportunity confidence. Int J Entrep Behav Res 29(5):1053–1074
Obstfeld D (2005) Social networks, the tertius iungens orientation, and involvement in innovation. Adm Sci Q 50(1):100–130
OECD (2023) OECD SME and entrepreneurship outlook 2023. OECD Publishing, Paris. https://doi.org/10.1787/342b8564-en
Onjewu AKE, Olan F, Paul S, Nguyen HTT (2023) The effect of government support on bureaucracy, COVID-19 resilience and export intensity: evidence from North Africa. J Bus Res 156:113468
Őri D, Szabó I, Kő A, Kovács T (2024) Digitalizing in crisis: the role of organizational resilience in SMEs' digitalization. J Enterp Inf Manag. https://doi.org/10.1108/jeim-03-2023-0141
Osiyevskyy O, Shirokova G, Ehsani M (2023) The role of effectuation and causation for SME survival amidst economic crisis. Int J Entrep Behav Res 29(7):1664–1697
Patel PC, Wolfe MT, Guedes MJ (2023) The triple-edged sword of sensitivity of sales, cash flows, and debt to investments: venture survival and capital investments. Manag Decis Econ 44(1):473–489
Paul J, Criado AR (2020) The art of writing literature review: What do we know and what do we need to know? Int Bus Rev 29(4):101717
Paul J, Rosado-Serrano A (2019) Gradual internationalization vs born-global/international new venture models: a review and research agenda. Int Mark Rev 36(6):830–858
Paul J, Khatri P, Kaur Duggal H (2024) Frameworks for developing impactful systematic literature reviews and theory building: What, why and how? J Decis Syst 33(4):537–550
Powell TC, Lovallo D, Fox CR (2011) Behavioral strategy. Strateg Manag J 32(13):1369–1374
Puhr H, Müllner J (2022) Foreign to all but fluent in many: the effect of multinationality on shock resilience. J World Bus 57(6):101370

Rajni-Swami A, Khan M, Hemrajani P, Dhiman R (2022) Mapping the intellectual structure of workplace spirituality through bibliometric analysis. FIIB Bus Rev 14:425–444
Ramli K, Spigel B, Williams N, Mawson S, Jack S (2023) Managing through a crisis: emotional leadership strategies of high-growth entrepreneurs during the COVID-19 pandemic. Entrep Reg Dev 35(1–2):24–48
Razavi Hajiagha SH, Alaei S, Sadraee A, Nazmi P (2024) A perspective of international performance improvement concentrating on innovation and digital resilience of SMEs: the case of an emerging economy. J Enterp Inf Manag 37(5):1709–1736
Razzak BM, Idris B, Hasan R, Saridakis G, Hansen JM (2023) The impact of COVID-19 on struggling ethnic minority entrepreneurs' business strategy: the case of Bangladeshi curry houses in the United Kingdom. Int J Entrep Behav Res 29(8):1837–1866
Roffia P, Dabić M (2024) The role of management control and integrated information systems for the resilience of SMEs. Rev Manag Sci 18(5):1353–1375
Roloff J (2023) Surviving or solidarity? Crisis responses of small and medium-sized enterprises during the COVID-19 pandemic. Bus Ethics Environ Responsib 32:243–256
Roundy PT, Im S (2024) Combining cognition and context: entrepreneurial alertness and the microfoundations of entrepreneurial ecosystems. Asia Pac J Manag. https://doi.org/10.1007/s10490-024-09951-7
Santoro G, Bertoldi B, Giachino C, Candelo E (2020a) Exploring the relationship between entrepreneurial resilience and success: the moderating role of stakeholders' engagement. J Bus Res 119:142–150
Santoro G, Bresciani S, Datta A (2020b) Digital technologies, performance, and business model innovation in SMEs: a systematic literature review. Technol Forecast Soc Change 160:120223
Santoro G, Messeni-Petruzzelli A, Del Giudice M (2021) Searching for resilience: the impact of employee-level and entrepreneur-level resilience on firm performance in small family firms. Small Bus Econ 57(1):455–471
Schulze BP, Katsinis A, Lagüera GJ, Di BL, Odenthal L, Hell M, Secades CB (2025) Annual report on European SMEs 2024/2025, SME Performance Review
Scott WR (2017) Institutional theory: onward and upward. Sage Handb Organ Inst 900:853–871
Seong J, White O, Birshan M, Woetzel L, Lamanna C, Condon J, Bush J (2024) Geopolitics and the geometry of global trade. McKinsey Global Inst 17
Seuring S, Gold S (2012) Conducting content-analysis based literature reviews in supply chain management. Supply Chain Manag Int J 17(5):544–555
Sharma GD, Kraus S, Liguori E, Bamel UK, Chopra R (2024a) Entrepreneurial challenges of COVID-19: re-thinking entrepreneurship after the crisis. J Small Bus Manag 62(2):824–846
Sharma GD, Kraus S, Talan A, Srivastava M, Theodoraki C (2024b) Navigating the storm: the SME way of tackling the pandemic crisis. Small Bus Econ 63(1):221–241
Shih YY, Lin CA (2022) Co-location with marketing value activities as manufacturing upgrading in a COVID-19 outbreak era. J Bus Res 148:410–419
Simms C, McGowan P, Pickernell D, Vazquez-Brust D, Williams A (2022) Uncovering the effectual-causal resilience nexus in the era of COVID-19: a case of a food sector SME's resilience in the face of the global pandemic. Ind Mark Manage 106:166–182
Sinha KK, Raby S, Salari T (2024) Exploring the scope and depth of digitalisation in times of crisis: Implications for SME resilience. Int Small Bus J 43:02662426241293000
Stevenson R, Guarana CL, Lee J, Conder SL, Arvate P, Bonani C (2024) Entrepreneurial identity and entrepreneurial action: a within-person field study. Personnel Psychol 77(1):197–224
St-Jean E, Tremblay M, Chouchane R, Saunders CW (2023) Career shock and the impact of stress, emotional exhaustion, and resources on entrepreneurial career commitment during the COVID-19 pandemic. Int J Entrepreneurial Behav Res 29(8):1927–1949
Su W, Junge S (2023) Unlocking the recipe for organizational resilience: a review and future research directions. Eur Manage J 41(6):1086–1105
Tagliazucchi G, De Canio F, Martinelli E (2023) Exploring perceived post-disaster performance in micro-businesses: How does entrepreneur psychological resilience matter? Entrep Reg Dev 35(5–6):445–459
Teece DJ (2007) Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strateg Manage J 28(13):1319–1350
Teece DJ, Pisano G, Shuen A (1997) Dynamic capabilities and strategic management. Strateg Manage J 18(7):509–533
Teruel-Sánchez R, Briones-Peñalver AJ, Bernal-Conesa JA, de Nieves-Nieto C (2021) Influence of the entrepreneur's capacity in business performance. Bus Strat Environ 30(5):2453–2467

Tm A, Kaur P, Ferraris A, Dhir A (2021) What motivates the adoption of green restaurant products and services? A systematic review and future research agenda. Bus Strat Environ 30(4):2224–2240
Tranfield D, Denyer D, Smart P (2003) Towards a methodology for developing evidence-informed management knowledge by means of systematic review. Br J Manage 14(3):207–222
Vershinina N, Rodgers P (2023) Self-regulation, micro-foundations and migrant entrepreneurs' capacities for resilience. Entrep Reg Dev 35(7–8):644–665
Vieira ES, Gomes JA (2009) A comparison of Scopus and Web of Science for a typical university. Scientometrics 81(2):587–600
Wang K, Pellegrini MM, Xue K, Wang C, Peng M (2024a) Digital resilience in the internationalization of small and medium companies: How does it work? J Enterp Inf Manag 37:1458–1478
Wang S, Cheah JH, Lim WM, Chang JYS (2024b) Management and organizational research in Asia Pacific: insights from a 40th anniversary review of the Asia Pacific Journal of Management. Asia Pac J Manag 41:1–24
Wang Y, Turkina E, Khoury S, Lemay N (2024c) Causal configurations of SME strategic renewal in crisis: qualitative comparative analysis (QCA) of Quebec entrepreneurs amid COVID-19. Entrep Reg Dev 36(5–6):745–774
Warner K, Wäger M (2019) Digital transformation and sustainability: a review and research agenda. J Bus Res 98:148–160
Wei W, He Z, Xiang G (2024) Why co-working spaces in an analogical environment exhibit different recovery abilities under the COVID-19 shock? Evidence from China. J Innov Knowl 9(3):100508
Wenzel M, Stanske S, Lieberman MB (2020) Strategic responses to crisis. Strateg Manage J 41(7/18):3161
Wenzel M, Danner-Schröder A, Spee AP (2021) Dynamic capabilities? Unleashing their dynamics through a practice perspective on organizational routines. J Manage Inq 30(4):395–406
Williams TA, Shepherd DA (2021) Bounding and binding: trajectories of community-organization emergence following a major disruption. Organ Sci 32(3):824–855
Williams TA, Gruber DA, Sutcliffe KM, Shepherd DA, Zhao EY (2017) Organizational response to adversity: fusing crisis management and resilience research streams. Acad Manage Ann 11(2):733–769
Zhang H, Lili MI, Xuefeng SHAO, Juan BU (2024) Demystifying pathways of composition-based international strategies under the de-globalization world: a configurational approach. J Int Manag 30(2):101085

Authors and Affiliations

Faisal Saeed Malik[1] · **Orestis Terzidis**[1]

✉ Faisal Saeed Malik
Faisal.malik@kit.edu

Orestis Terzidis
Orestis.terzidis@kit.edu

[1] The Institute of Entrepreneurship, Technology-Management, and Innovation (EnTechnon), Karlsruhe Institute of Technology (KIT), Fritz Erler Str. 1-3, Gebäude 01.85, 76131 Karlsruhe, Germany