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**ASSESING THE RELATIONSHIP BETWEEN DYNAMIC
CAPABILITIES AND SUPPLY CHAIN RESILIENCE FOR
BUMIPUTERA SME CONTRACTORS: KEY CONTRIBUTORS,
RESEARCH HOTSPOTS**

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Abstract:

The occurrence of supply chain disruptions, intensified by the Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) in modern business scenarios, highlights the urgent need for robust strategies to mitigate their influence on business performance. Small and Medium Enterprise (SME) contractors face numerous challenges and vulnerabilities in supply chain management SCM activities, necessitating the establishment of a Supply Chain Resilience (SCRE) framework, primarily aimed at enhancing business continuity. Unlike larger firms, Bumiputera SMEs often lack essential resources and capabilities to manage these disruptions, rendering them particularly vulnerable. Therefore, this study identifies the key themes that integrate SCRE, considering its associations with Dynamic Capabilities (DC). A bibliometric analysis was performed employing performance assessment and scientific visualisation techniques. Data were extracted from the Scopus database and analysed by VOSviewer. The methodology encompasses a systematic framework, including defining search criteria, data analysis, network visualisation, and thematic clustering to identify structural and evolutionary patterns in SCRE. The findings emphasised that 'supply chain resilience' is a central theme, strongly linked to DCs, supply chain management, and organisational resilience. Furthermore, deficiencies in this study have been identified, especially in emerging markets and the role of DCs in SCRE. The results of this investigation will provide a comprehensive overview of the DCs and SCRE, thereby providing theoretical and practical

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implications for academicians, policymakers, and industry stakeholders. The study lays the groundwork for future research directions that aim to advance DCs and SCRE in the construction sector.

Keywords:

Bibliometric Analysis; Dynamic Capabilities; Supply Chain Resilience; Bumiputera SME; Contractors

Introduction

The construction industry plays a vital role in driving national economic growth and supporting the achievement of long-term development objectives. Despite being a key pillar of economic development, the construction industry confronted numerous difficulties and challenges worldwide due to its distinctiveness and complexity. The emergence of a Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) environment has disrupted traditional approaches to supply chain activities and heightened the need for improvements in construction. These include fluctuating market conditions, fragmented supply chain processes, skilled labour shortages, and vulnerability to external disruptions such as pandemics and geopolitical instability. Furthermore, the risks and challenges arising from the VUCA landscape have impacted the organisation's performance, leading to disruptions in production, increased costs, and delays in deliveries, as well as low customer satisfaction and reduced revenue streams (Liu et al., 2023; Saleh & Watson, 2017).

The increasing complexity and unpredictability of global supply chains have emphasised the crucial requirements for organisations to build resilient and adaptive capabilities. For Small and Medium Enterprises (SMEs), these disruptions pose a significant threat to continuity, growth, and competitiveness. Therefore, understanding their Supply Chain Resilience (SCRE) is crucial for enhancing their competitiveness and sustainability, as well as achieving SME business continuity (Awang Ali et al., 2023; Herbane, 2019). Unlike large companies, SMEs often have inadequate resources to lessen prolonged interruptions, making resilience essential for maintaining operational continuity, minimising downtime, and preserving revenue streams (Oduro & Mensah-Williams, 2023). Existing literature often overlooks how Dynamic Capabilities (DCs) are developed and deployed by SMEs in the construction industry, particularly in the context of supply chain disruptions.

DCs and SCRE have emerged as fundamental imperatives for organizations functioning within the contemporary landscape characterized by VUCA. Moreover, DCs, such as sensing market changes, seizing opportunities, and reconfiguring resources, empower organisations to strategically adjust to external disturbances (Kähkönen et al., 2023). Simultaneously, SCRE facilitates the continuity of operations by allowing firms to anticipate, respond to, and recover from disruptions efficiently. The integration of these two constructs is particularly significant for resource-constrained firms, such as SMEs, which face greater exposure to risks and limited capabilities. Additionally, strengthening DCs enhances an organisation's agility, while building resilience safeguards supply chain performance, competitiveness, and long-term sustainability.

In the Malaysian construction industry context, Bumiputera SME contractors form a vital component of the construction sector; yet, they often struggle to manage supply chain disruptions due to financial resource constraints, technological capabilities, and strategic preparedness. Furthermore, integrating DCs into an SCRE framework is crucial to equip contractors with the ability to sense changes, adapt operations, and transform strategies in the face of disruptions. Dynamic Capability Theory (DCT) provides a useful framework for understanding how a contractor's organization can respond effectively to such turbulence. It is characterized as an organization's ability to amalgamate, develop, and reconfigure internal and external competencies to address rapidly changing environments. Capabilities such as market sensing, financial agility, technological adaptation, and strategic collaboration empower firms to navigate uncertainty and recover from disruptions. These capabilities are important for Bumiputera SMEs operating in volatile environments with limited capabilities and support systems.

However, while prior studies have explored SCRE, many scholars have focused on its application in various organisational settings, and its relevance to the Bumiputera SME construction sector remains limited. Most existing studies focus on large manufacturing firms in developed countries, thus overlooking Bumiputera SME contractors who operate under inadequate resources, unique institutional, cultural, and economic constraints. Thus, this gap underscores the need for context-specific investigations to examine how resource-constrained firms develop and maintain resilience in their supply chains. Notably, bridging this gap is essential to identifying where research efforts have been concentrated and where future studies can make meaningful contributions.

This study utilises bibliometric analysis to examine the evolution of research on SCRE and DCs, with a particular focus on applications within Bumiputera SMEs and the construction sector. By analysing publication patterns, influential authors, co-citation networks, and thematic clusters, this method enables the identification of intellectual hotspots and under-researched areas. The findings from the bibliometric review inform the theoretical grounding of the study, guide the development of the conceptual framework, and ensure alignment with global research directions.

Furthermore, this study aims to assess the relationship between DCs and SCRE for Bumiputera SME contractors through a bibliometric analysis. Specifically, it identifies key contributors, maps research hotspots, and highlights emerging trends that can inform future theoretical development and practical applications in the SME construction sector. The findings are expected to support policymakers, researchers, and industry practitioners in strengthening the resilience of Bumiputera SMEs amid a rapidly changing business landscape. The following are the objectives of this study:

- 1) To examine the current state of research and uncover potential future directions and thematic evolutions in dynamic capabilities and supply chain resilience
- 2) To determine prospects and potential associated with dynamic capabilities and the supply chain resilience through co-word analysis

The structure of the paper is designed to present the flow of the bibliometric analysis as follows. This section provides an overview of SCRE and DCs, the study motivation, and the necessity of improving DCs for SCRE. Moreover, Section 2 elaborates on the bibliometric analysis approach and explains the science mapping analysis, while Section 3 articulates the findings of

the clusters produced based on a current and future map of the subject. The theoretical and managerial implications are discussed in Section 4. Following this, the limitations and future research avenues are presented in Sections 5 and 6, and the conclusion is presented in Section 7.

Methodology

In this segment, the research outlines the methodical framework used to gather, analyze, and interpret bibliometric information on DCs and SCORE.

Bibliometric Analysis and Science Mapping

The bibliometric approach represents a novel quantitative method that helps scholars to analyse patterns in scientific publications. It enables scholars to quantify the impact, productivity, and collaboration of scholars, institutions, and journals, while simultaneously identifying influential documents and thematic trends (Donthu et al., 2021). Moreover, by understanding how research in a particular field has evolved, bibliometric analysis establishes a basis for evidence-based decision-making and informs future research directions.

On the other hand, science mapping, often integrated within bibliometric analysis, focuses on visualizing the structure and dynamics of scholarly knowledge. It includes mapping associations among authors, publications, keywords, or citations to disclose the intellectual, conceptual, and social structure of a field. Key techniques used in science mapping include **co-authorship analysis**, **co-citation analysis**, **bibliographic coupling**, and **co-word analysis**. These methods help identify core research clusters, emerging topics, and the development of scientific domains over time. Based on the objectives of this study, two analyses are employed to meet the study's objectives:

- a. **Bibliographic coupling:** It operates based on the identification of relationships between documents based on the number of references they share. When two documents with the same reference depict the similarity of the co-citing documents, they are considered bibliographically coupled. The strength of their connection increases with the number of shared citations, indicating potential thematic similarity or alignment in research focus (Zupic & Čater, 2015). Additionally, bibliographic coupling also identifies the present and periodical themes developed from citing publications in a field, thereby evaluating the current and emerging themes (Donthu et al., 2021).
- b. **Co-word analysis:** This analysis is a form of content analysis technique that evaluates the relationship between words to form a conceptual connection by building a relationship (Zupic & Čater, 2015). It focuses on how often two or more words appear together in the titles, abstracts, or keyword lists of documents, which reflects the conceptual connections among research themes. Furthermore, co-word analysis represents a singular analysis that assesses the publication's actual content in measuring the similarity of themes (Fauzi et al., 2024). The relationship between keywords enables researchers to provide insight into how research topics are related, developed, and interconnected over time and explore upcoming trends in a particular subject (Donthu et al., 2021).

Research Design and Data Collection Procedure

The literature review was conducted on June 28, 2025, using the Scopus database, a multidisciplinary repository recognized for its high-quality, strictly peer-reviewed publications. It was nominated due to its standardised metadata and compatibility with widely

recognised bibliometric tools (e.g., VOSviewer). In this study, VOSviewer version 1.6.18 was used to analyze, construct, and visualize bibliometric networks (van Eck & Waltman, 2017). This software is widely recognised for its capability to create visual maps representing relationships among authors, institutions, keywords, and references, thereby facilitating the identification of intellectual structures and thematic patterns within a research domain. Moreover, these instruments rely on the extensive citation and author connectivity frameworks provided by Scopus, which enable the high-accuracy mapping of scientific trends and networks. Scopus is the most comprehensive bibliographic database traditionally used for bibliometric analysis, offering extensive coverage of peer-reviewed literature across disciplines (Pranckutė, 2021). The two main keywords employed are DCs and SCRE, as in Table 1.

Table 1. Search String in SCOPUS Database.

No.	Keywords	Justification
1	"resilience" OR "robustness" OR "adaptability" OR "agility" OR "continuity" OR "durability" OR "flexibility"	To identify literature related to resilience
2	"dynamic capabilit*" OR "adaptive capabilit*" OR "strategic capabilit*" OR "transformative capabilit*" OR " reconfigurative capabilit*"	To identify literature related to dynamic capabilities

Source: SCOPUS Database

The clarity and reproducibility in the articulation of the data selection methodology will be published using The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Azizan & Fadzil, 2024). The graphical representation of the data filtering and inclusion process is presented in Figure 1. To optimise the retrieval of pertinent documents, the search was conducted across titles, abstracts, and author keywords (TITLE-ABS-KEY). Initially, the retrieval yielded 180 documents. These records were pre-processed using the following criteria:

- Inclusion criteria: Peer-reviewed journal articles published in English from the year 2010 to early 2025, explicitly related to DCs and SCRE, and encompassing related keywords in the title, abstract, and keywords.
- Exclusion criteria: Conference proceedings, book chapters, review papers, editorial materials, non-English documents, duplicates, and articles characterised by inadequate metadata (e.g, missing abstracts or author information).

Following a restriction to solely journal publications, the total number of publications was 150. The purpose of limiting journal articles in bibliometric analysis is to ensure the inclusion of high-quality, peer-reviewed, and thematically consistent sources, thereby enhancing the reliability of science mapping, the clarity of thematic clustering, and the integrity of citation-based metrics (Fauzi et al., 2024). Moreover, various methodologies pertinent to science mapping, including co-authorship analysis, co-citation analysis, and bibliographic coupling, were employed to facilitate a comprehensive examination. These methodologies facilitate the identification of research collaborations, influential publications, and the progression of scholarly discourse within the field. Using tools like VOSviewer, the analysis generated visual clusters of keywords, authors, and documents, highlighting core themes and research trends.

Consequently, the resulting maps enabled the identification of dominant research clusters, emerging areas of interest, and key contributors in the field of DCs and SCRE. Additionally, it delivers valuable insights into how the area has developed and where future research might be directed.

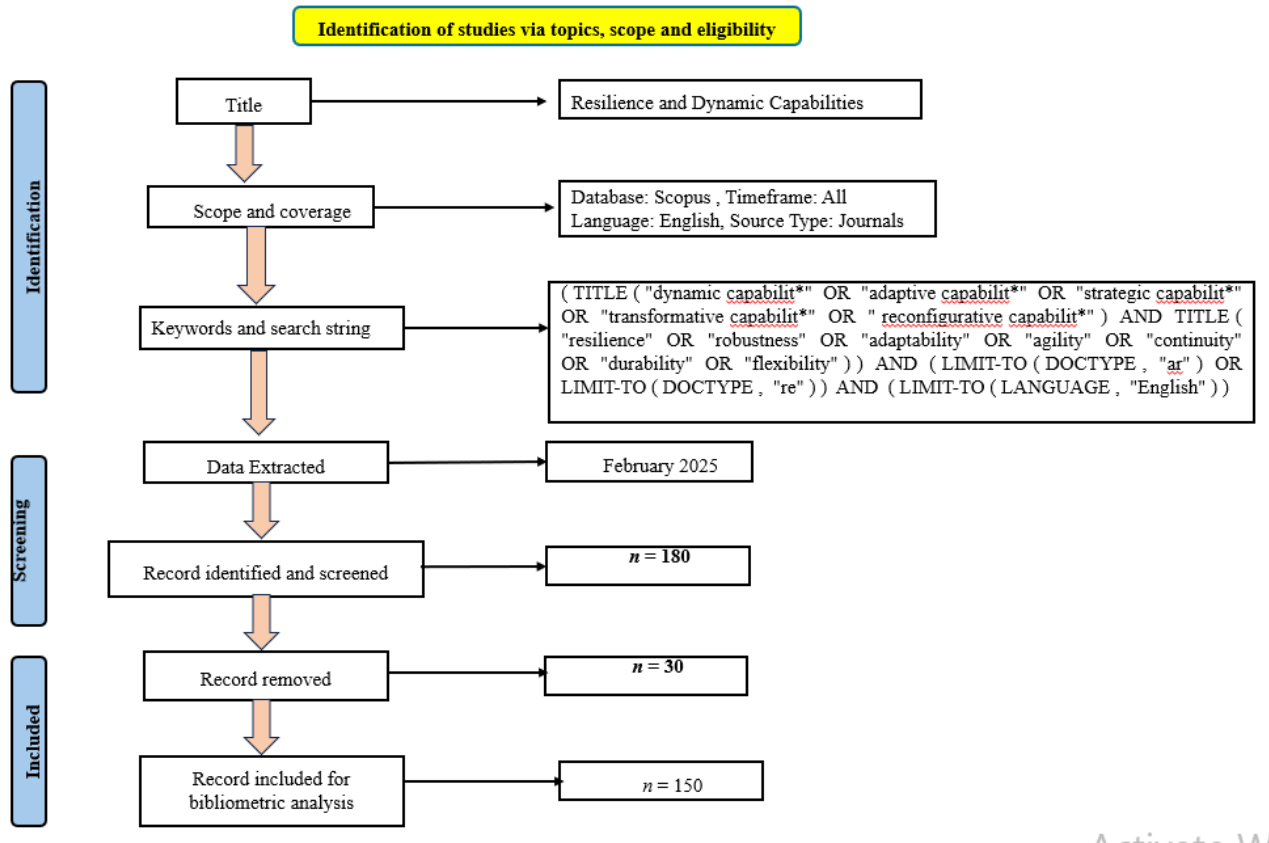


Figure 1: The Flowchart of Data Filtration and Inclusion Process

Source: SCOPUS Database

Results

Overview of Scientific Production and Publication Patterns

SCRE and DCs have exhibited substantial development over the years, reflecting the post-pandemic COVID-19. Figure 2 illustrates the annual trend of total publications and citations from 2011 to 2025 based on a Scopus bibliometric search. The number of publications remained modest between 2011 and 2015, followed by a noticeable increase in publication output after 2016, rising from fewer than 5 papers annually during 2011–2016 to more than 15 papers per year from 2021 onward, peaking at around 45 publications in 2024. This trend may indicate growing research interest, possibly driven by increased attention to SCRE and DCs in the post-pandemic period. In contrast, the total citation trend follows a different pattern, with citation peaks occurring in 2016 and 2022. Notably, despite low publication counts in 2016, the citation count reached its highest point, suggesting that highly influential articles may have been published that year. Citations have declined sharply in recent years, particularly in 2024 and 2025, which is expected because of the time lag typically required for newly published

articles to accumulate citations. Thus, this citation lag underscores the importance of considering productivity and impact when evaluating scholarly trends. This surge aligns with a global shift in research priorities, where crises such as COVID-19 heightened international attention on resilience, risk management, and adaptive capabilities across supply chains.

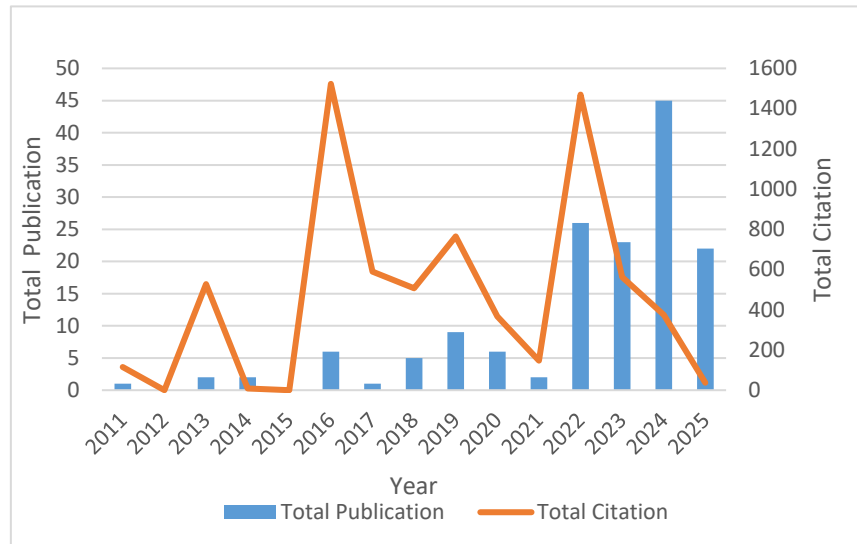


Figure 2: Annual Trend of Total Publications and Citations

Source: Scopus database

Research Impact: Authors, Institutions, and Citation Leaders

Contributions from various countries, institutions, and influential scholars have driven SCRE and DCs. Figure 3 presents the distribution of documents by country or territory, highlighting the top contributors to the selected research field. China leads with the highest number of publications (26), followed closely by the United States (19) and India (15). Other prominent contributors include Australia (14), the United Kingdom (14), and Indonesia (12). Furthermore, European countries such as Germany (8), Finland (7), and France (7) also demonstrate moderate publication activity. Notably, Malaysia (7) appears at the bottom of the list, indicating a relatively lower research output compared to other countries in the dataset. This distribution suggests that, while developed economies dominate the literature, emerging contributions from countries such as Indonesia and Malaysia reflect a growing regional interest and participation.

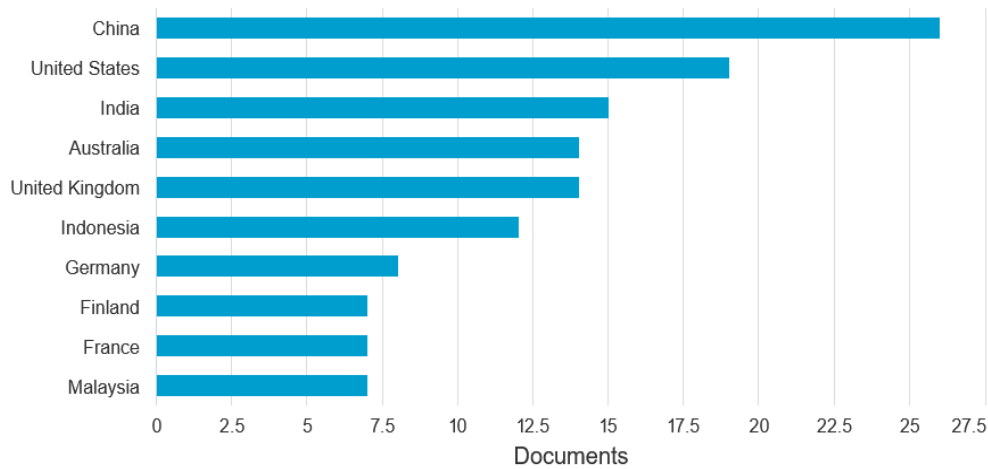


Figure 3: Distribution of Documents by Country or Territory

Source: SCOPUS Database

Conversely, Figure 4 illustrates the number of documents published by various academic affiliations. The University of Technology Sydney (5) leads with the largest number of publications, followed by Xi'an University of Technology (4), indicating their strong research engagement in the relevant field. The remaining affiliations, including Punjabi University (3), HEC Montréal (3), Vaasan Yliopisto (3), and RMIT University (3), demonstrate moderate performance by producing three documents. It also reveals a limited institutional concentration, suggesting decentralised research activity with no university contributing more than five publications. Thus, it demonstrates that the areas of SCRE and DCs remain fragmented and emerging, but lack a strong institutional anchor. Moreover, the absence of strong institutional representation from Southeast Asia suggests a notable research gap and signals opportunities for regional universities to enhance their visibility in this field. In particular, Malaysia's contribution remains comparatively modest, which may be attributed to factors such as constrained research funding, limited industry–academia collaboration, and the common practice of publishing in local non-indexed journals, ultimately reducing the region's presence in major international databases. This wide dispersion in author-level productivity also reflects the interdisciplinary nature of the field and indicates the emergence of new research communities contributing to its development. Hence, future bibliometric mapping could benefit from expanding keyword coverage or timespan to capture more institutional diversity and deeper scholarly engagement.

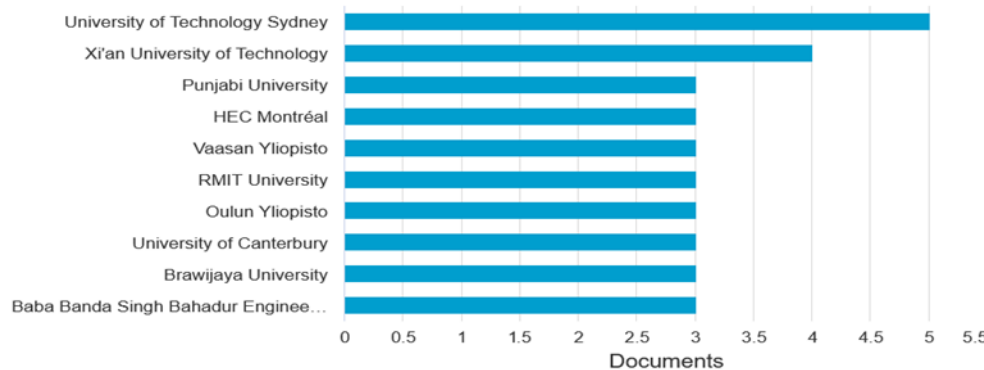


Figure 4: Distribution of Academic Institutions' Publication Output

Source: SCOPUS Database

Figure 5 presents the distribution of documents by author, identifying the top contributors to the research domain. The dataset reveals that multiple researchers have made significant contributions, with several producing three publications each, while a smaller group has contributed two publications apiece. The relatively low publication count per author suggests that the field is broadly dispersed across multiple contributors rather than dominated by a few prolific scholars. This pattern reflects the interdisciplinary and emerging nature of the research area, possibly linked to SCRE or DCs. Additionally, it also implies an opportunity for further scholarly development and deeper collaboration among authors to build a more cohesive and influential body of work.

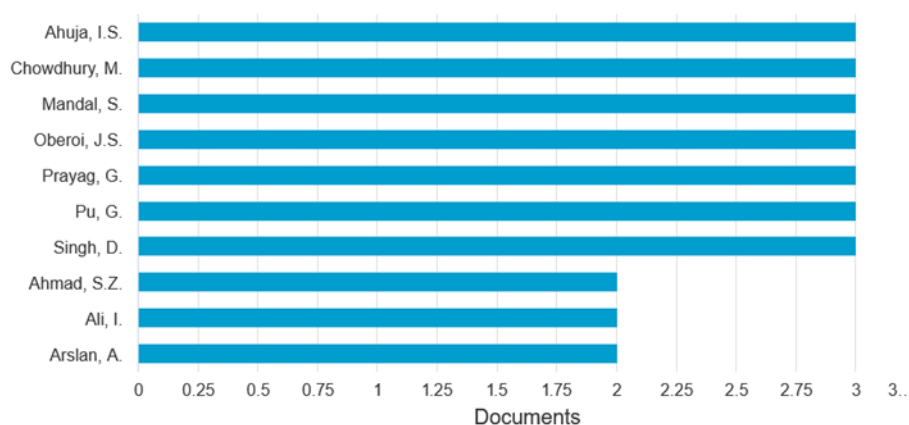


Figure 5: Distribution of Documents by Author

Source: SCOPUS Database

The top 10 most influential studies on DCs and SCRE demonstrate that researchers are increasingly interested in viewing resilience as something that can be developed through organisational capabilities. Among them, Chowdhury & Quaddus (2017a) is the most cited, with 122 citations and a Total Link Strength (TLS) of 119. Their work is important because they introduced a clear framework for understanding SCRE using DCT and also developed a validated scale to measure it. More recent studies observed how the Coronavirus Disease 2019 (COVID-19) prompted organisations to develop new DCs, particularly in terms of agility, preparedness, and adaptability (Kähkönen et al., 2023). (Yu et al., 2019) and Jiang et al. (2019)

linked resilience to improved financial performance and organisational change, demonstrating the actual value of these capabilities in uncertain environments.

Other scholars, such as (Stadtfeld & Gruchmann, 2024) have demonstrated through meta-reviews and studies on digital tools that the field is becoming increasingly advanced. These tools include big data analytics (Bahrami & Shokouhyar, 2022) and information technology (IT) infrastructure (Mikalef et al., 2021); the field now encompasses both technological and environmental dimensions. Similarly, research by (Ozanne et al., 2022) SMEs and Sabahi et al. (2020) also highlight that DCT can be applied in various contexts, as noted by SMEs and Sabahi et al. (2020) in relation to innovation capabilities. Altogether, these studies provide a strong foundation for understanding SCRE through DCs and reveal gaps such as the need for more research on different sectors, moderating variables, and resilience strategies tailored to regions like the Global South.

Table 2: Summary of key publications linking Dynamic Capabilities and Supply Chain Resilience

No.	Publication	Scope	Citation	TLS	Insights
1	(Chowdhury & Quaddus, 2017)	Supply chain resilience: Conceptualisation and scale development using dynamic capability theory	122	119	It offers an inclusive consideration of Supply Chain Resilience (SCRE), conceptualising it as a multidimensional and hierarchical construct rooted in Dynamic Capability Theory (DCT). The research develops and validates a measurement instruments for SCRE, identifying three primary dimensions: proactive capability, reactive capability, and supply chain design quality.
2	(Kähkönen et al., 2023)	COVID-19 as a trigger for dynamic capability development and supply chain resilience improvement	44	84	This paper examines the influence of the COVID-19 pandemic on firms' dynamic capabilities and their subsequent effects on supply chain resilience, specifically within the medical device industry. It represents the Dynamic Capability View (DCV) as a basis for understanding how companies adapted to the rapid and extensive disruptions caused by the pandemic.
3	(El Idrissi M. et al., 2023)	Organisational crisis preparedness during the COVID-19 pandemic: an investigation of dynamic capabilities and organisational agility roles	41	77	This study examines the roles of Dynamic Capabilities (DCs) and Organisational Agility (OA) in enhancing firms' preparedness for organisational crises, especially in the context of the COVID-19 pandemic.
4	(Yu et al., 2019)	Dynamism, disruption orientation, and resilience in the supply chain and impacts on financial performance: A dynamic capability perspective	37	99	This paper examines the intricate relationship between supply chain dynamism, disruption orientation, resilience, and their combined effect on a firm's financial performance. It proposes and tests an integrated conceptual framework using survey data from Chinese companies, offering insights into how firms can better manage supply chain challenges in dynamic environments.

5	(Jiang et al., 2019)	Building a tourism organisation resilience to crises and disasters: A dynamic capabilities view	33	69	This paper proposes a theoretical framework to understand how tourism organisations can build long-term resilience in the face of crises and disasters, emphasising the role of Dynamic Capabilities (DCs) and slack resources. It moves beyond traditional crisis management to focus on adaptation and transformation, drawing insights from strategic management literature, particularly the Resource-Based View (RBV) and evolutionary theory of the firm.
6	(Stadtfeld & Gruchmann, 2024)	Dynamic capabilities for supply chain resilience: a meta-review	29	70	This paper presents a meta-review of existing literature to enrich the theoretical understanding of Dynamic Capabilities (DC) in Supply Chain Resilience (SCRES). It synthesises relevant constructs into a comprehensive framework and offers insights for future research, particularly extending DC theory to include a 'holding/buffering' dimension for stability-based SCRES.
7	(Mikalef et al., 2021)	IT architecture flexibility and IT governance decentralisation as drivers of IT-enabled dynamic capabilities and competitive performance: The moderating effect of the external environment	29	59	This paper examines how IT architecture flexibility and IT governance decentralization serve as drivers for IT-enabled dynamic capabilities and competitive performance, particularly considering the moderating effect of the external environment.
8	(Bahrami & Shokouhyar, 2022)	The role of big data analytics capabilities in bolstering supply chain resilience and firm performance: a dynamic capability view	27	91	This paper examines the contribution of Big Data Analytics Capabilities (BDAC) to firm performance, specifically through the mediating role of Supply Chain Resilience (SCR) and the moderating influence of Risk Management Culture (RMC).

9	(Ozanne et al., 2022)	SMEs navigating COVID-19: The influence of social capital and dynamic capabilities on organisational resilience	26	80	This paper examines the pivotal role of Social Capital (SC) and Dynamic Capabilities (DC) in enhancing organisational resilience among SMEs during the COVID-19 pandemic. It addresses a gap in marketing literature regarding how business networks contribute to organisational resilience.
10	(Sabahi et al., 2020)	Firm innovation and supply chain resilience: A dynamic capability perspective	23	94	This paper investigates the relationship between organisational innovation and the resilience of the supply chain, adopting a dynamic capability framework. It aims to understand how innovative firms are more resilient to supply chain disruptions and identifies the mediating capabilities that facilitate this resilience.

Key Research Hotspots in Dynamic Capabilities and Supply Chain Resilience

This investigation revealed that 58 out of 150 documents met the citation threshold of 20. The threshold was determined to ensure a balanced and meaningful network visualisation, avoiding the exclusion of too many relevant studies or the inclusion of excessive noise (Geng et al., 2024). This approach enabled the identification of clearer thematic structures within the science mapping analysis. Figure 6 presents a visual representation of the network diagram depicting bibliographic coupling. The analysis identified four clusters that are distinctly independent from one another. The subsequent evaluation focuses on the prevailing trends and prospective developments regarding DCs and SCRE within the construction context. Following this, the clusters are identified and labelled based on the authors' qualitative evaluation of the representative articles within each cluster and the synthesized research themes present in each network. By maintaining thematic consistency across the clusters among multiple authors, the objectivity and reliability of the findings are significantly augmented

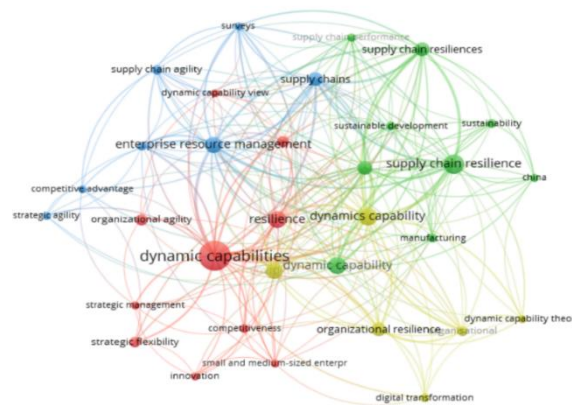


Figure 6: The Overlay Visualisation (Four Clusters Based on the Author's Keywords)

Source: VOSviewer

Cluster 1 (red): Comprising 22 documents, the first cluster is labeled “**Dynamic Capabilities and Organizational Agility Focus**”. The red cluster primarily focuses on how organisations remain flexible and competitive in uncertain and rapidly changing environments. DCT claimed that organisations can survive and grow by identifying changes in the market, capitalising on new opportunities, and adapting their internal resources promptly. These capabilities are reflected in how organisations demonstrate agility and adaptability, especially when facing disruptions or sudden market changes (Chari et al., 2022). Additionally, Pereira (2019) further explains that organisations in emerging markets use capabilities such as innovation and responsiveness to manage uncertainty and maintain competitiveness. Similarly, Singh (2013) explores how organisations build resilience through internal routines that help them bounce back from disruptions. Finally, Ozanne (2024) adopts a broader perspective by combining DCs with systems thinking to understand how businesses can remain resilient economically and socially. In short, this cluster of research helps explain how organisations learn, adapt, and thrive in tough environments. It demonstrates that having the right internal skills and the ability to shift gears quickly is key to surviving in a VUCA world.

Cluster 2 (green): This cluster comprises 18 documents labeled “**Sustainability, Resilience, and SME Context**”. The green cluster emphasizes resilience from the perspectives of sustainability and organizational scale, particularly for SMEs. Blome (2013) examines how environmental sustainability initiatives can improve long-term supply chain performance while enhancing resilience. Furthermore, Mandal (2018) suggests that resource-constrained SME firms can still achieve resilience by leveraging informal networks and adaptive processes. Likewise, this aligns well with Mikael (2021), who examines resilience indicators in SMEs across developing countries, finding that relational and financial agility are key. These studies complement each other by providing practice-oriented frameworks for organisations in constrained settings, unlike the red cluster’s more abstract theorising. The connection between green and blue clusters is evident in their shared concern for vulnerability, while the link to the red cluster lies in how DCs are embedded within smaller and sustainability-oriented firms.

Cluster 3 (blue): With 15 documents, this cluster is labeled “**Supply Chain Risk and Operational Management**”. The Blue Cluster focuses on practical strategies for managing supply chain risks, particularly during times of crisis. Chowdhury (2017) highlights how supply chains can be designed to withstand disruptions. Moreover, Altay (2018) focuses on disaster resilience and humanitarian logistics, while Yu (2019) provides predictive models for disruptions and recovery. Eltantawy (2016) demonstrates the importance of organisational learning, and Belhadi (2022) highlights the application of agile and lean practices during pandemics. Conversely, Pattanayak (2024) examines how organisations collaborate during supply chain disruptions. Overall, this cluster is more focused on preparedness, response, and recovery, complementing the red cluster’s theoretical lens.

Cluster 4 (yellow): This cluster consists of two documents labeled “**Supply Chain Innovation and Digital Capabilities**”. Although comparatively smaller, this cluster plays a critical bridging role between theory and application. Jiang (2019) anchors this cluster with a focus on digital supply chain transformation, illustrating how IT capabilities operate as dynamic enablers of resilience. This cluster highlights innovation capabilities, such as cloud integration, Internet of Things (IoT), and data analytics, that enable firms to sense and respond in real-time. Dynamic Capability Theory is highly adaptable and applicable across diverse organisational and sectoral contexts (Ozanne et al., 2022, and Sabahi et al., 2020). Additionally, these digital elements serve as operational extensions of DCs, reinforcing the theoretical propositions of the red cluster while providing actionable tools, as seen in the blue cluster.

Collectively, these clusters demonstrate how the study of SCRE and DCs has progressed from theoretical roots in organizational agility (Cluster 1) to applied, data-driven, and sustainability-oriented frameworks (Clusters 2-4). This path demonstrates the multidisciplinary intersection of management theory, digital innovation, and resilience strategy.

Table 3. Summary of the Current Themes on Dynamic Capabilities and Supply Chain Resilience.

Cluster No. and colour	Cluster label	Number of publications	Representative publication
1 (red)	Dynamic Capabilities & Organisational Agility Focus	22	Teece (2016), Chari (2022), Chi (2022), Pereira (2019), Singh (2013), Ozanne (2024)
2 (green)	Sustainability, Resilience, and SME Context	11	Chowdhury (2017), Altay (2018), Yu (2019), Eltantawy (2016), Pattanayak (2024), Belhadi (2022)
3 (blue)	Supply Chain Risk & Operational Management	11	Blome (2013), Mandal (2018), Mikael (2021)
4 (yellow)	Supply Chain Innovation & Digital Capabilities	2	Jiang (2019)

Source: SCOPUS Database and VOS viewer

Co-word Analysis

Using the same database, the co-word analysis reveals 32 keywords from a total of 751, achieving a threshold of 5. The network map of bibliographic coupling is depicted in Figure 6. As in the previous analysis, the threshold was determined after several trials to produce the most appropriate and robust network map. According to this analysis, the term “dynamic capabilities” (311 occurrences) served as the central node, highlighting its strong centrality in the research domain and its interlinkage with key terms such as ‘resilience,’ ‘agility,’ and ‘sustainability. Subsequently, it was followed by “supply chain management” (151 occurrences), “organisational resilience” (96 occurrences), and “Covid-19” (71 occurrences). Table 4 presents the top 10 keywords on DCs and SCRE.

Table 4. Top 10 Keywords on Dynamic Capabilities and Supply Chain Resilience

Rank	Keywords	Occurrences	Total Link Strength
1	Dynamic Capabilities	311	49
2	Supply Chain Management	151	28
3	Organizational Resilience	96	18
4	Covid – 19	71	20
5	Supply Chain Agility	50	18
6	Surveys	35	5
7	Organizational	33	7
8	Supply Chain Resilience	27	19
9	Industrial Management	27	6
10	Enterprise Resource Management	19	14

Source: VOS viewer

Additionally, Figure 7 visualises the network structure. It visibly demonstrates three clusters, suggesting that three different research streams have been produced in the subject. The three clusters are narrowed down and assigned appropriate labels that represent the most relevant themes.

Cluster 1 (red): The cluster comprises 10 items. The red cluster is anchored by the keyword “**dynamic capabilities,**” which serves as the central concept of the co-word network. This cluster includes related terms such as strategic management, innovation, strategic flexibility, organisational agility, and competitiveness. Hence, these terms collectively underscore the strategic dimension of DCs, where firms must mobilise internal and external competencies to address rapidly changing environments. Furthermore, scholars such as Teece (1997) and Eisenhardt have emphasised how DCs underpin sustainable competitive advantage by facilitating continuous innovation and adaptation. Overall, the red cluster represents the theoretical foundation of DCs, emphasising its relevance in enabling organisational responsiveness, innovation, and sustained performance.

Cluster 2 (green): This cluster comprises nine keywords labeled “**Supply Chain Resilience and Sustainability**”. The green cluster is centered on keywords such as supply chain resilience, *supply chains*, *sustainability*, and *sustainable development*. These co-occurring terms suggest a strong thematic connection between resilience practices and sustainable supply chain strategies, particularly in the context of environmental and economic disruptions. The repeated presence of both singular and plural forms, such as *supply chain resilience* and *supply chain resiliences*, suggested widespread scholarly emphasis on measuring and conceptualizing resilience across different contexts. Moreover, the inclusion of *China and manufacturing* reflects the regional and sectoral focus in many resilience studies. This cluster also integrates dynamic concepts such as *DC*, demonstrating how sustainability and resilience are increasingly viewed through the lens of adaptive capabilities. Overall, the green cluster embodies the application of DCs within supply chain systems, particularly how firms build adaptive capacity for long-term sustainability.

Cluster 3 (blue): This cluster comprises seven keywords and is labeled “**Operational Agility and Enterprise Systems.**” It focuses on operational aspects, including Enterprise Resource Management, supply chain agility, surveys, and competitive advantage. The emphasis here is on how digital systems and enterprise-level tools support agility and enhance performance. ERM is closely tied to digital integration, allowing firms to coordinate complex supply chain activities more efficiently. The inclusion of competitive advantage suggests that organisations with strong digital infrastructure and system integration are better positioned to achieve superior performance. The presence of the keyword “surveys” suggests that the majority of research in this area employs quantitative methods to measure operational capabilities and agility-related outcomes. Overall, this cluster highlights the technological and operational enablers of SCRE, serving as a bridge between the theoretical concepts (as seen in the red cluster) and their practical applications (green cluster). Table 5 summarizes the co-word analysis, which reflects emerging research trends on DCs and SCRE.

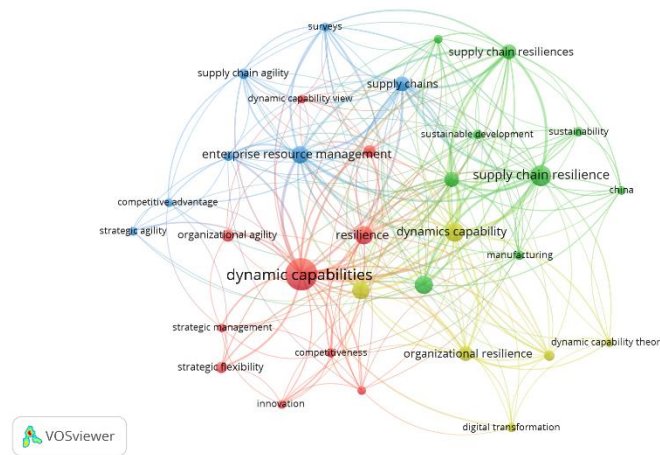


Figure 7: Co-Word Analysis on Supply Chain Resilience and Dynamic Capabilities

Source: VOS viewer

Table 5: Keyword Clustering of Core Research Themes in Dynamic Capabilities and Supply Chain Resilience

Cluster No. and colour	Cluster label	Number of keywords	Representative keywords
1 (red)	Dynamic Capabilities and Strategic Agility	10	Dynamic capabilities, organisational agility, competitiveness, resilience, innovation, strategic flexibility, strategic management
2 (green)	Supply Chain Resilience and Sustainability	9	Manufacturing, supply chain management, supply chain performance, supply chain resilience, sustainability, sustainable development
3 (blue)	Operational Agility and Enterprise Systems	7	Competitive advantage, enterprise resource management, industrial management, supply chain agility, strategic agility

Source: SCOPUS Database

Identified Research Gaps And Potential Directions For Future Research

This bibliometric analysis highlights several important gaps that future research can address to deepen the understanding of DC and SCR. Most current studies focus heavily on the manufacturing and healthcare sectors, while industries such as construction, agriculture, and public procurement are largely overlooked, especially in developing countries. Furthermore,

there is also a strong geographical bias, with research dominated by developed countries, leaving regions like Southeast Asia underrepresented, despite their unique resource constraints and institutional challenges. Moreover, technological exploration remains limited. However, some studies mention big data and IT systems, the role of emerging technologies, such as Artificial Intelligence (AI), IoT, and Building Information Modeling (BIM), in enhancing DCs, but this has yet to be fully explored. Additionally, many studies rely solely on DCT without integrating other theoretical perspectives, which could enrich the understanding of how firms build resilience. The addition of moderating or mediating roles of variables such as government support, technology adoption, and collaborative networks appears to be important in shaping resilience outcomes.

In the methodological context, the majority of studies are cross-sectional, providing only a snapshot of a particular time. There is a clear need for longitudinal research to understand how capabilities evolve and contribute to sustaining resilience. Furthermore, measurement tools for DC and SCR are often general and may not reflect the contextual realities of SMEs, particularly in developing countries. The influence of external stakeholders such as government bodies, financial institutions, and supply chain partners is another area that has not been sufficiently explored.

Implications

Theoretical Implications

This research offers significant theoretical contributions by elucidating the DCT to build SCORE in uncertain environments. The co-word analysis supports the idea that DCs, such as sensing, seizing, and reconfiguring, are key for organisations to survive in volatile conditions, as suggested by Teece (2007). Furthermore, by focusing on the supply chains of SMEs in developing countries, this study applies DCT in a context that is often overlooked. The findings suggest a connection between strategic management topics, such as agility, innovation, and competitiveness, and practical supply chain issues, including risk management, sustainability, and digital transformation. In addition, by linking IT capabilities to resilience, the study supports the view that technology is both a tool for building capabilities and a result of them. The inclusion of ideas like organisational resilience, sustainability, and strategic flexibility also demonstrates that DCT can be applied at multiple levels, from firm strategies to operations and wider supply chain networks. Overall, this study addresses the need for a more detailed application of DCT in real-world situations, particularly in challenging environments such as supply chain disruptions and VUCA conditions. It offers valuable insights for both researchers and practitioners

Managerial Implications

This study provides valuable guidance for managers, particularly within SMEs, on how to strategically develop and apply DCs to enhance their SCORE. The co-word analysis reveals the importance of capabilities such as organisational agility, strategic flexibility, digital transformation, and collaboration, all of which are critical for coping with disruptions, market volatility, and uncertainty. The findings emphasise that SMEs need to go beyond short-term problem-solving and instead build long-term adaptive capacity through enterprise risk management (ERM) systems, technological integration, and learning from past disruptions. Furthermore, top management should promote collaboration and create stronger relationships with suppliers and external stakeholders to sustain performance during disruptions. In addition,

the emergence of sustainability-related terms in the co-word analysis suggests that integrating environmental and social goals into supply chain practices can serve as a resilience enabler and a competitive advantage. Notably, this study highlights that resilience is an operational issue and a key strategic priority. Managers who actively build DCs will be better prepared to keep their supply chains running smoothly, strengthen their organisation's competitiveness, and handle future challenges with more confidence and flexibility.

Conclusion

This study provides a comprehensive understanding of how DCs facilitate the development of SCRE, particularly in the context of SMEs in VUCA contexts. Through a bibliometric and co-word analysis, the study has identified several key thematic clusters, ranging from strategic agility and innovation to risk management, sustainability, and digital transformation, that collectively shape the discourse on resilience. The findings reinforce the relevance of DCT as a robust theoretical framework for explaining how firms sense disruptions, seize opportunities, and reconfigure resources to maintain continuity and competitiveness. Furthermore, the study highlights the growing intersection between operational agility, technological capability, and environmental sustainability, offering a multidimensional view of resilience. Overall, this research offers theoretical and managerial insights that can guide future efforts in building more adaptive, resilient, and strategically agile supply chains, especially for SMEs navigating the uncertainties of today's business landscape.

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