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Structural Drivers of Corporate Resilience during Economic Crises: An ISM–MICMAC Approach

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ABSTRACT

Economic crises have repeatedly exposed firms' vulnerabilities in absorbing shocks, adapting to adverse conditions, and restoring performance. Corporate resilience has therefore become a critical concept in understanding firms' ability to survive and recover during periods of economic disruption. However, existing studies largely examine resilience determinants in isolation, offering limited insight into their structural and hierarchical interdependencies.

Objectives: *This study aims to examine corporate resilience during economic crises by adopting a structural perspective that recognizes the interdependencies among key resilience determinants and identifies their hierarchical roles within an integrated system.*

Methodology*: This study adopts a qualitative structural research design using Interpretive Structural Modeling (ISM) combined with MICMAC analysis. Twelve determinants of corporate resilience were identified through an extensive literature review and validated by expert judgment involving academics and finance practitioners.*

Findings: *The results show that liquidity and buffer capacity function as foundational driving factors enabling financial flexibility, which serves as an intermediate structural mechanism. Stability and adaptability act as linkage mechanisms that translate financial capacity into operational continuity, while recovery performance emerges as a dependent outcome. The absence of autonomous variables indicates that all determinants are structurally interconnected.*

Conclusion: *The study proposes a Corporate Resilience Architecture that explains resilience as a hierarchical organizational capability, providing both a theoretical framework for future resilience research and a practical roadmap for strengthening organizational preparedness during economic crises*

Keywords*: Corporate Resilience; Financial Flexibility; Liquidity Management; Crisis Management; Interpretive Structural Modeling (ISM).*

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INTRODUCTION

Economic crises repeatedly expose structural weaknesses in firms' financial and operational systems. Episodes such as the Global Financial Crisis, the COVID-19 pandemic, and recent macroeconomic disruptions demonstrate that organizational failure during crises is driven not only by declining profitability but also by firms' inability to absorb shocks, adapt to changing conditions, and recover sustainably. Consequently, corporate resilience has become an essential organizational capability for maintaining business continuity, competitive advantage, and long-term firm value under conditions of uncertainty (Duchek, 2020; Kahn et al., 2021).

Previous studies consistently identify liquidity, financial flexibility, operational adaptability, and recovery performance as important determinants of corporate resilience. Firms with stronger cash holdings, adequate financial slack, and greater financing flexibility are better able to withstand financial distress, maintain strategic investments, and recover more rapidly from economic shocks (Acharya et al., 2021; Ding et al., 2021; Fahlenbrach et al., 2021). Likewise, operational capabilities such as revenue stability and cost flexibility support business continuity during periods of economic uncertainty (Bloom et al., 2021; Papanikolaou & Schmidt, 2022). However, most existing studies examine these determinants independently using regression-based or variance-oriented approaches, providing limited understanding of how they interact structurally within an integrated resilience system.

This limitation creates an important research gap. Although previous studies explain whether individual determinants influence resilience, they provide little insight into which determinants function as foundational drivers, which serve as enabling mechanisms, and how organizational recovery emerges through sequential interactions among financial and operational capabilities. Since corporate resilience represents a complex organizational capability rather than a collection of independent variables, a structural modeling approach is required to identify these hierarchical interrelationships. Accordingly, this study conceptualizes corporate resilience as a hierarchical organizational system consisting of four interrelated dimensions: Liquidity and Buffer Capacity, Financial Flexibility, Stability and Adaptability, and Recovery Performance. Using Interpretive Structural Modeling (ISM) integrated with MICMAC analysis, the study identifies the structural relationships among twelve resilience determinants and classifies them according to their strategic roles as driving, linkage, dependent, and autonomous variables.

This study contributes to the literature in three ways. First, it integrates the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory into a unified framework explaining the hierarchical development of corporate resilience. Second, it applies the ISM-MICMAC approach to reveal structural interdependencies among resilience determinants rather than merely estimating direct effects. Third, the study proposes a Corporate Resilience Architecture that identifies foundational drivers, intermediary mechanisms, and recovery outcomes, thereby providing both theoretical insight and practical guidance for strengthening organizational resilience during periods of economic crisis.

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LITERATURE REVIEW

Corporate Resilience during Economic Crises

Corporate resilience refers to an organization's ability to anticipate, absorb, adapt to, and recover from economic disruptions while maintaining business continuity and long-term competitiveness (Duchek, 2020). As economic uncertainty becomes increasingly complex, resilience has evolved beyond crisis management into a strategic organizational capability that integrates financial preparedness, adaptive management, and sustainable recovery (Kahn et al., 2021). Recent studies further indicate that dynamic capabilities enable organizations to transform strategic resources into resilience, highlighting resilience as a continuous organizational process rather than a temporary response to crises.

Previous studies consistently identify four interrelated dimensions of corporate resilience. Liquidity and buffer capacity, represented by cash holding, current ratio, and financial slack, provide firms with the financial resources required to absorb unexpected shocks and reduce financial distress (Acharya et al., 2021; Ding et al., 2021). Financial flexibility, reflected through debt capacity, operating cash flow adequacy, and access to external financing, enables firms to sustain investment and adapt their financing strategies under uncertain conditions (Gamba & Triantis, 2008; Fahlenbrach et al., 2021). Stability and adaptability, including revenue stability and cost flexibility, facilitate operational continuity despite declining market demand (Bloom et al., 2021; Papanikolaou & Schmidt, 2022). Finally, recovery performance, measured through CAPEX resilience, speed of profit recovery, post-crisis firm value, and survival probability, represents the observable outcome of effective financial and operational adaptation (Er-Rami et al., 2024).

This perspective is also supported by studies published in MIX: Jurnal Ilmiah Manajemen, which emphasize that dynamic capabilities, strategic flexibility, and sound financial management strengthen organizational performance under uncertain business environments. In particular, recent evidence demonstrates that organizational flexibility enhances firms' ability to adapt to environmental change and improve long-term competitiveness. Despite substantial empirical evidence, existing studies predominantly investigate these determinants independently using regression-based or panel-data approaches. While such methods successfully estimate direct relationships among variables, they provide limited understanding of the hierarchical interactions through which financial resources are transformed into organizational resilience. Consequently, the literature offers little explanation regarding which determinants function as foundational drivers, which operate as enabling mechanisms, and which ultimately emerge as recovery outcomes.

Integrated Theoretical Foundation

This study integrates four complementary theoretical perspectives to explain the hierarchical architecture of corporate resilience. The Resource-Based View (RBV) explains that liquidity-related resources including cash holding, current ratio, and financial slack constitute valuable strategic assets that enable firms to absorb external shocks (Barney, 1991). However, resource ownership alone is insufficient to ensure resilience in dynamic environments. Building upon RBV, Dynamic Capabilities Theory argues that organizations achieve resilience by continuously sensing environmental change, seizing strategic opportunities, and reconfiguring resources into adaptive organizational capabilities (Teece, 2007).

Financial resources therefore become valuable only when transformed into effective managerial actions. This argument is consistent with recent studies emphasizing that dynamic

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capabilities represent the primary mechanism through which firms build resilience under turbulent environments. The financial mechanism supporting this transformation is explained by Financial Flexibility Theory, which suggests that firms possessing sufficient debt capacity, stable operating cash flows, and access to external financing are better able to sustain investment and organizational adaptation during economic crises (Gamba & Triantis, 2008; Fahlenbrach et al., 2021). Complementing these perspectives, Organizational Resilience Theory conceptualizes resilience as a sequential process of anticipation, absorption, adaptation, and recovery, implying that recovery outcomes are generated by the cumulative effectiveness of upstream financial and operational capabilities (Duchek, 2020).

Accordingly, corporate resilience is conceptualized as a hierarchical organizational capability consisting of foundational financial resources, enabling financial mechanisms, adaptive operational capabilities, and recovery outcomes. This integrated theoretical perspective provides the conceptual justification for employing Interpretive Structural Modeling (ISM) and MICMAC analysis, which are specifically designed to identify structural interdependencies among complex organizational determinants.

Literature Synthesis and Research Gap

Previous studies consistently demonstrate that liquidity, financial flexibility, operational adaptability, and recovery performance contribute positively to corporate resilience. Nevertheless, these determinants have generally been examined separately, with limited attention given to their structural interdependencies. As a result, existing research explains whether individual determinants influence organizational performance but provides limited insight into how resilience develops through sequential organizational mechanisms. From a theoretical perspective, the literature has not fully integrated financial and organizational resilience theories into a unified framework capable of explaining hierarchical relationships among resilience determinants. Methodologically, regression-based approaches estimate direct effects but cannot reveal driving variables, linkage mechanisms, or dependent outcomes within a resilience system.

To address these limitations, this study applies Interpretive Structural Modeling (ISM) integrated with MICMAC analysis to identify the hierarchical architecture of corporate resilience. Unlike previous studies, this research classifies resilience determinants according to their structural roles and demonstrates how liquidity resources evolve into financial flexibility, operational adaptability, and ultimately sustainable recovery performance. By moving beyond conventional causal analysis, the study contributes a structural explanation of corporate resilience and provides a foundation for future quantitative validation. Based on the literature, this study identifies twelve determinants grouped into four dimensions: Liquidity and Buffer Capacity (cash holding, current ratio, financial slack), Financial Flexibility (debt capacity, cash flow adequacy, access to external financing), Stability and Adaptability (Revenue Stability and Cost Flexibility), and Recovery Performance (CAPEX Resilience, Speed of Profit Recovery, Firm Value, and Survival Probability).

RESEARCH PROPOSITIONS AND FRAMEWORK

Research Propositions

Given the exploratory and structural nature of Interpretive Structural Modeling (ISM), this study does not formulate statistical hypotheses. Instead, it develops research propositions derived from the theoretical foundations and prior empirical studies to guide the identification

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of contextual relationships among corporate resilience determinants. These propositions describe the expected structural interactions within the resilience system rather than causal effects. Based on the reviewed literature, the following propositions are proposed:

P1. Liquidity and buffer capacity function as the foundational drivers of corporate resilience by enabling firms to absorb economic shocks.

P2. Financial flexibility acts as an intermediate enabling mechanism that transforms financial resources into adaptive organizational capabilities.

P3. Stability and adaptability mediate the translation of financial flexibility into organizational continuity during economic crises.

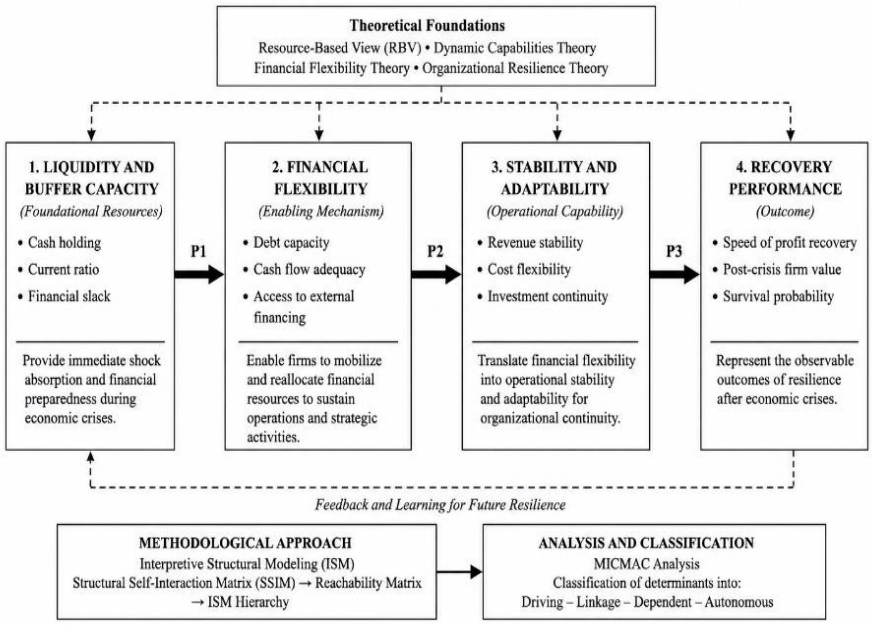
P4. Recovery performance represents the dependent outcome emerging from the interaction of liquidity, financial flexibility, and operational adaptability.

These propositions provide the conceptual basis for constructing the Structural Self-Interaction Matrix (SSIM), developing the ISM hierarchy, and classifying determinants through MICMAC analysis.

Theoretical Framework

Drawing upon the Resource-Based View (RBV), Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory, this study conceptualizes corporate resilience as a hierarchical and interdependent system comprising four dimensions: liquidity and buffer capacity, financial flexibility, stability and adaptability, and recovery performance. Liquidity and buffer capacity constitute the foundational strategic resources that enable firms to withstand external shocks. Financial flexibility functions as an enabling capability that mobilizes and reallocates financial resources under conditions of uncertainty, while stability and adaptability translate these financial capabilities into operational continuity. Recovery performance represents the ultimate outcome of the resilience process through improved organizational survival, profitability recovery, and firm value.

Figure 1. Theoretical Framework



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Unlike previous studies that primarily examine these dimensions using regression-based approaches, this study assumes that corporate resilience emerges through hierarchical interactions among determinants rather than through isolated direct effects. Accordingly, Interpretive Structural Modeling (ISM) is employed to identify the hierarchical architecture of corporate resilience, whereas MICMAC analysis is used to classify the strategic roles of each determinant as driving, linkage, dependent, or autonomous variables.

Research Novelty

Unlike previous studies that primarily examine corporate resilience using regression-based approaches, this study conceptualizes resilience as a hierarchical organizational capability. The novelty of this research lies in three aspects. First, it integrates the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory into a unified Corporate Resilience Architecture. Second, it employs the integrated ISM-MICMAC approach to identify the hierarchical relationships and strategic roles of resilience determinants as driving, linkage, and dependent variables. Third, the proposed architecture provides a systematic capability-building roadmap, demonstrating how liquidity and buffer capacity evolve into financial flexibility, operational adaptability, and ultimately sustainable recovery performance. This structural perspective extends existing resilience literature by explaining not only which determinants are important, but also how they interact sequentially within an integrated organizational system.

METHODOLOGY

Research Design

This study employed a qualitative structural research design using Interpretive Structural Modeling (ISM) integrated with Cross-Impact Matrix Multiplication Applied to Classification (MICMAC) to examine the hierarchical structure of corporate resilience during economic crises. ISM is widely recognized as an appropriate methodology for analysing complex systems because it identifies contextual relationships among interrelated variables and transforms them into a multi-level hierarchical structure rather than estimating statistical causality (Warfield, 1974; Sushil, 2012; Kamble et al., 2023). MICMAC complements ISM by classifying variables according to their driving and dependence power, thereby providing a comprehensive understanding of their structural roles within the system (Godet, 2000; Attri et al., 2013). This qualitative structural approach is particularly suitable for developing conceptual models grounded in expert knowledge and contextual interpretation (Creswell & Poth, 2018; Saunders et al., 2023).

Identification of Determinants and Expert Judgment

The determinants of corporate resilience were identified through a structured literature review covering corporate resilience, financial flexibility, liquidity management, and organizational resilience. Following recommendations for systematic literature synthesis (Snyder, 2019; Paul & Criado, 2020), twelve determinants were identified and grouped into four dimensions: Liquidity and Buffer Capacity (Cash Holding, Current Ratio, and Financial Slack), Financial Flexibility (Debt Capacity, Cash Flow Adequacy, and Access to External Financing), Stability and Adaptability (Revenue Stability and Cost Flexibility), and Recovery Performance (CAPEX Resilience, Speed of Profit Recovery, Post-crisis Firm Value, and

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Survival Probability (Duchek, 2020; Ding et al., 2021; Acharya et al., 2021). These determinants constituted the structural elements analysed using the ISM-MICMAC framework.

Expert judgment involved five purposively selected experts consisting of two academics and three senior practitioners with expertise in corporate finance, strategic management, treasury, financial planning, and enterprise risk management (Table 1). Purposive sampling was adopted because participants were selected based on their expertise and ability to provide informed structural judgments rather than statistical representativeness (Campbell et al., 2020; Saunders et al., 2023). Consistent with ISM methodology, expert competence was prioritized over sample size (Warfield, 1974; Sushil, 2012). Experts were selected based on their academic qualifications, professional experience, publication records, managerial positions, and direct involvement in corporate financial decision-making during periods of economic uncertainty.

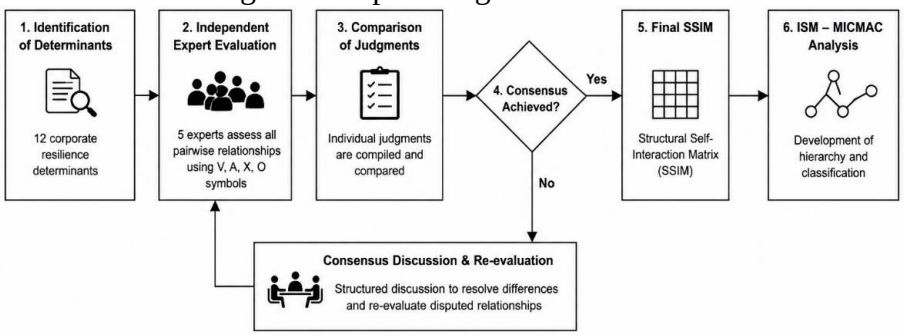
Table 1. Profile of the Expert Panel

Expert	Background	Area of Expertise	Experience	Selection Criteria
E1	Academic	Corporate Finance	18 years	Research and publications in corporate finance and financial resilience
E2	Academic	Strategic Management	15 years	Research in strategic management and organizational resilience
E3	Practitioner	Corporate Finance	20 years	Senior finance executive with crisis management experience
E4	Practitioner	Risk Management	16 years	Expertise in enterprise risk management and corporate sustainability
E5	Practitioner	Financial Planning & Treasury	14 years	Experience in liquidity management, financial planning, and business continuity

Source: Developed by the authors (2026)

Before the assessment, all experts participated in a briefing session to establish a common understanding of the research objectives, operational definitions of the twelve determinants, and the interpretation of the ISM contextual relationship symbols (V, A, X, and O). Each expert independently evaluated all pairwise contextual relationships among the determinants by answering the guiding question: *"Does determinant i significantly influence determinant j in strengthening corporate resilience during economic crises?"* The individual judgments were subsequently compiled and compared. Relationships receiving unanimous agreement were accepted directly, whereas differing opinions were resolved through structured consensus discussions until unanimous agreement was achieved. Such consensus-based procedures are recommended because they reduce individual bias and enhance the credibility and consistency of qualitative judgments (Hasson & Keeney, 2021).

Figure 2. Expert Judgment Procedure



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Following the assessment of all sixty-six pairwise relationships, a relationship screening procedure was conducted to distinguish direct contextual relationships from indirect relationships prior to constructing the Structural Self-Interaction Matrix (SSIM). Each relationship was evaluated according to three criteria: whether the influence was direct, whether it represented an essential structural dependency, and whether it could not be more appropriately represented through transitivity. Consequently, twenty-two direct contextual relationships were retained in the final SSIM, whereas indirect relationships were incorporated automatically during the transitivity stage of the ISM analysis.

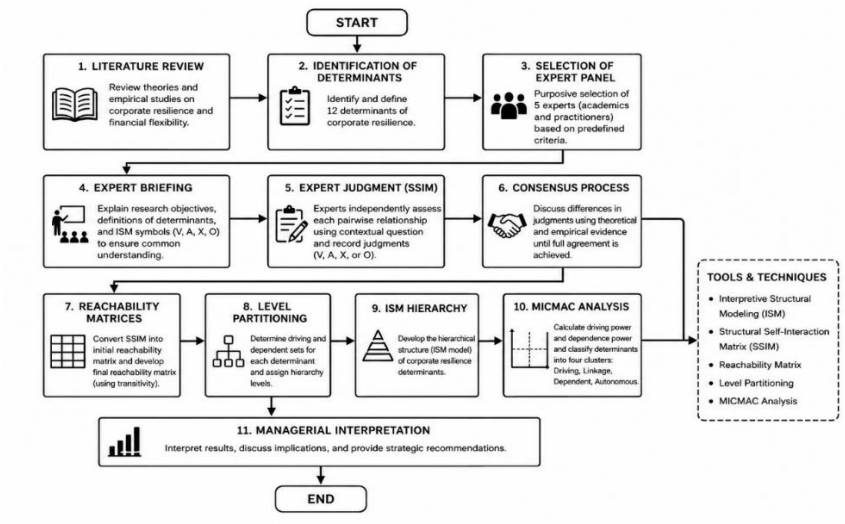
ISM-MICMAC Analysis

The finalized SSIM was converted into an Initial Reachability Matrix by transforming qualitative contextual symbols into binary values. The transitivity principle was subsequently applied to generate the Final Reachability Matrix, assuming that if determinant i influences determinant j, and determinant j influences determinant k, then determinant i also influences determinant k (Warfield, 1974; Sushil, 2012). Based on the Final Reachability Matrix, iterative level partitioning was performed by comparing reachability, antecedent, and intersection sets until all determinants were assigned to their respective hierarchical levels. MICMAC analysis was then conducted to calculate the driving and dependence power of each determinant and classify them into driving, linkage, dependent, and autonomous variables (Godet, 2000; Attri et al., 2013; Kamble et al., 2023).

Research Quality Assurance

To enhance methodological rigor, several quality assurance procedures were implemented throughout the study. Content validity was established through a structured review of contemporary literature on corporate resilience and financial flexibility. Expert validity was ensured through purposive selection of qualified academics and practitioners with substantial expertise in finance, strategic management, and risk management. Interpretive reliability was strengthened through structured consensus discussions whenever differences in expert judgments occurred.

Figure 3. Research Procedure of the ISM–MICMAC Framework for Corporate Resilience Analysis



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The consistency of expert judgments was subsequently evaluated using Kendall's Coefficient of Concordance (W) (Kendall & Gibbons, 1990). Finally, procedural reliability was enhanced through a structured multi-stage expert judgment process consisting of independent assessment, comparison of individual judgments, and consensus validation, thereby minimizing individual bias while ensuring that the resulting structural relationships reflected collective expert knowledge. The overall research procedure began with the identification of corporate resilience determinants through a structured literature review, followed by expert selection and judgment to construct the Structural Self-Interaction Matrix (SSIM). The SSIM was subsequently transformed into the Initial and Final Reachability Matrices using the transitivity principle. Iterative level partitioning was then employed to develop the ISM hierarchy, while MICMAC analysis classified the determinants according to their driving and dependence power, resulting in the proposed Corporate Resilience Architecture.

RESULTS

Structural Self-Interaction Matrix (SSIM)

Based on expert judgment, sixty six pairwise contextual relationships were initially identified among the twelve determinants of corporate resilience (Table 2).

Table 2. Pairwise Contextual Relationships among Corporate Resilience Determinants

No	Variable Pair	Relationship	No	Variable Pair	Relationship
1	CH – CR	V	34	DC – CF	V
2	CH – FS	V	35	DC – CAPEX	V
3	CH – DC	V	36	DC – SPR	V
4	CH – CFA	V*	37	DC – FV	V
5	CH – AEF	V*	38	DC – SP	V
6	CH – RS	V*	39	CFA – AEF	X
7	CH – CF	V*	40	CFA – RS	V
8	CH – CAPEX	V*	41	CFA – CF	V
9	CH – SPR	V*	42	CFA – CAPEX	V
10	CH – FV	V*	43	CFA – SPR	V
11	CH – SP	V*	44	CFA – FV	V
12	CR – FS	V	45	CFA – SP	V
13	CR – DC	V	46	AEF – RS	X
14	CR – CFA	V	47	AEF – CF	V
15	CR – AEF	V	48	AEF – CAPEX	V
16	CR – RS	V	49	AEF – SPR	V
17	CR – CF	V	50	AEF – FV	V
18	CR – CAPEX	V	51	AEF – SP	V
19	CR – SPR	V	52	RS – CF	X
20	CR – FV	V	53	RS – CAPEX	V
21	CR – SP	V	54	RS – SPR	V
22	FS – DC	V	55	RS – FV	V
23	FS – CFA	V	56	RS – SP	V
24	FS – AEF	V	57	CF – CAPEX	V
25	FS – RS	V	58	CF – SPR	V
26	FS – CF	V	59	CF – FV	V
27	FS – CAPEX	V	60	CF – SP	V
28	FS – SPR	V	61	CAPEX – SPR	V
29	FS – FV	V	62	CAPEX – FV	V
30	FS – SP	V	63	CAPEX – SP	V
31	DC – CFA	X	64	SPR – FV	X
32	DC – AEF	V	65	SPR – SP	X
33	DC – RS	V	66	FV – SP	V

Source: Developed by the authors (2026)

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Following the relationship screening procedure, twenty-two direct contextual relationships were retained to construct the finalized Structural Self Interaction Matrix (SSIM) (Table 3). These relationships reveal a sequential structural pattern in which liquidity and buffer capacity directly influence financial flexibility, which subsequently supports stability and adaptability before ultimately contributing to recovery performance. The finalized SSIM provides the structural basis for the subsequent reachability analysis and ISM hierarchy.

Although Table 2 contains all sixty-six possible pairwise contextual relationships, not every relationship represents a direct structural dependency. In accordance with the ISM methodology, the complete relationship set was subsequently screened to distinguish direct relationships from indirect ones. Indirect relationships were not discarded from the overall structural model; instead, they were generated automatically during the transitivity analysis performed in the reachability matrix. This procedure reduces structural redundancy while preserving the integrity of the hierarchical model.

The resulting twenty-two direct contextual relationships constitute the finalized Structural Self-Interaction Matrix (SSIM). These relationships represent the minimum set of direct structural interactions required to explain the hierarchical architecture of corporate resilience. The remaining contextual relationships identified in the initial assessment are reflected indirectly through the transitivity mechanism during the construction of the reachability matrix.

Table 3. Structural Self-Interaction Matrix (SSIM)

No	Variable Pair	Relationship	No	Variable Pair	Relationship
1	CH – CR	V	12	CFA – RS	V
2	CH – FS	V	13	CFA – CF	V
3	CH – DC	V	14	AEF – RS	X
4	CR – FS	V	15	AEF – CF	V
5	CR – DC	V	16	RS – CF	X
6	FS – DC	V	17	RS – CAPEX	V
7	FS – CFA	V	18	CF – CAPEX	V
8	FS – AEF	V	19	CAPEX – SPR	V
9	DC – CFA	X	20	SPR – FV	X
10	DC – AEF	V	21	SPR – SP	X
11	CFA – AEF	X	22	FV – SP	V

Source: Developed by the authors (2026)

Table 3 presents the final Structural Self-Interaction Matrix (SSIM) consisting of twenty-two direct contextual relationships that underpin the hierarchical structure of corporate resilience. The matrix indicates that liquidity and buffer capacity determinants, namely Cash Holding (CH), Current Ratio (CR), and Financial Slack (FS), directly influence financial flexibility mechanisms represented by Debt Capacity (DC), Cash Flow Adequacy (CFA), and Access to External Financing (AEF).

These financial flexibility determinants subsequently support organizational stability and adaptability through Revenue Stability (RS) and Cost Flexibility (CF), which ultimately contribute to recovery performance outcomes, including CAPEX Resilience (CAPEX), Speed of Profit Recovery (SPR), Post-crisis Firm Value (FV), and Survival Probability (SP). Several reciprocal relationships are also identified among closely related determinants, reflecting feedback mechanisms within the resilience system. The finalized SSIM provides the structural foundation for constructing the Initial Reachability Matrix and subsequent hierarchical analysis.

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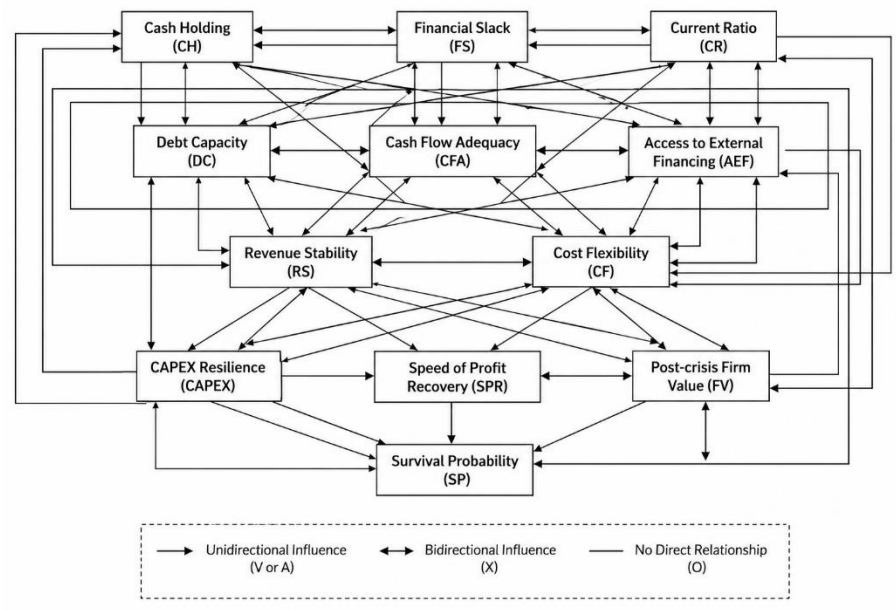
Initial Relationship Network

Figure 4 illustrates the overall contextual relationships among the twelve resilience determinants prior to hierarchical decomposition. The network demonstrates that liquidity related variables occupy central positions and maintain extensive interactions with financial flexibility, operational adaptability, and recovery determinants. While the network reflects the complexity of the resilience system, hierarchical relationships become more evident after the application of ISM transitivity and level partitioning.

Figure 4. Initial Relationship Network among the Determinants of Corporate Resilience Based on Pairwise Contextual Relationships



Source: Developed by the authors (2026)

The relationship network demonstrates that the resilience system is highly interconnected, with financial variables occupying the central positions of the network. Liquidity-related determinants, namely Cash Holding (CH), Current Ratio (CR), and Financial Slack (FS), exhibit extensive direct relationships with financial flexibility variables, including Debt Capacity (DC), Cash Flow Adequacy (CFA), and Access to External Financing (AEF). These variables subsequently interact with organizational adaptability factors represented by Revenue Stability (RS) and Cost Flexibility (CF), which ultimately connect to recovery performance outcomes, including CAPEX Resilience (CAPEX), Speed of Profit Recovery (SPR), Post-crisis Firm Value (FV), and Survival Probability (SP). The dense interconnections shown in Figure 4 suggest that corporate resilience is driven by an integrated system in which financial capacity, operational adaptability, and recovery performance are closely linked.

Although the relationship network effectively captures the complexity of interactions among the determinants, its dense structure makes it difficult to identify the relative importance and hierarchical ordering of variables. Therefore, the network serves only as the initial structural representation. In the subsequent ISM procedure, these contextual relationships are transformed into the Structural Self-Interaction Matrix (SSIM), followed by the Initial and Final Reachability Matrices, enabling the derivation of a simplified hierarchical structure and the identification of key driving and dependent determinants.

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Reachability Matrix and Driving (Dependence Analysis)

The contextual relationships identified in the SSIM were transformed into the initial reachability matrix and subsequently refined through the transitivity principle to derive the final reachability matrix (Table 4 and 5). The incorporation of indirect relationships substantially expands the structural connections among determinants, particularly from liquidity and buffer capacity toward financial flexibility, stability and adaptability, and recovery performance.

Table 4. Initial Reachability Matrix (Pre-Transitivity)

i \ j	CH	CR	FS	DC	CFA	AEF	RS	CF	CAPEX	SPR	FV	SP	DP
CH	1	1	1	1	1	1	1	1	1	1	1	1	12
CR	0	1	1	1	1	1	1	1	1	1	1	1	11
FS	0	0	1	1	1	1	1	1	1	1	1	1	10
DC	0	0	0	1	1	1	1	1	1	1	1	1	9
CFA	0	0	0	1	1	1	1	1	1	1	1	1	9
AEF	0	0	0	1	1	1	1	1	1	1	1	1	9
RS	0	0	0	1	1	1	1	1	1	1	1	1	9
CF	0	0	0	1	1	1	1	1	1	1	1	1	9
CAPEX	0	0	0	0	0	0	0	0	1	1	1	1	4
SPR	0	0	0	0	0	0	0	0	0	1	1	1	3
FV	0	0	0	0	0	0	0	0	0	1	1	1	3
SP	0	0	0	0	0	0	0	0	0	1	1	1	3

V → (i,j)=1 ; (j,i)=0, A → (i,j)=0 ; (j,i)=1, X → (i,j)=1 ; (j,i)=1, O → (i,j)=0 ; (j,i)=0

Source: Developed by the authors (2026)

The initial reachability matrix presented in Table 4 represents the direct contextual relationships among the twelve determinants of corporate resilience before the application of transitivity. The matrix shows that Cash Holding (CH), Current Ratio (CR), and Financial Slack (FS) exert the broadest direct influence on other determinants, whereas CAPEX Resilience (CAPEX), Speed of Profit Recovery (SPR), Post-crisis Firm Value (FV), and Survival Probability (SP) primarily function as recipient variables. The conversion of the SSIM into the initial reachability matrix establishes the structural basis for identifying the driving and dependence characteristics of each determinant.

Table 5. Driving - Dependence Power

Determinant	Driving Power	Dependence Power
CH	12	1
CR	11	2
FS	10	3
DC	9	8
CFA	9	8
AEF	9	8
RS	9	8
CF	9	8
CAPEX	4	9
SPR	3	12
FV	3	12
SP	3	12

Source: Data processed by the author (2026)

As summarized in Table 5, Cash Holding (CH) exhibits the highest driving power (12) and the lowest dependence power (1), followed by Current Ratio (CR) with a driving power of

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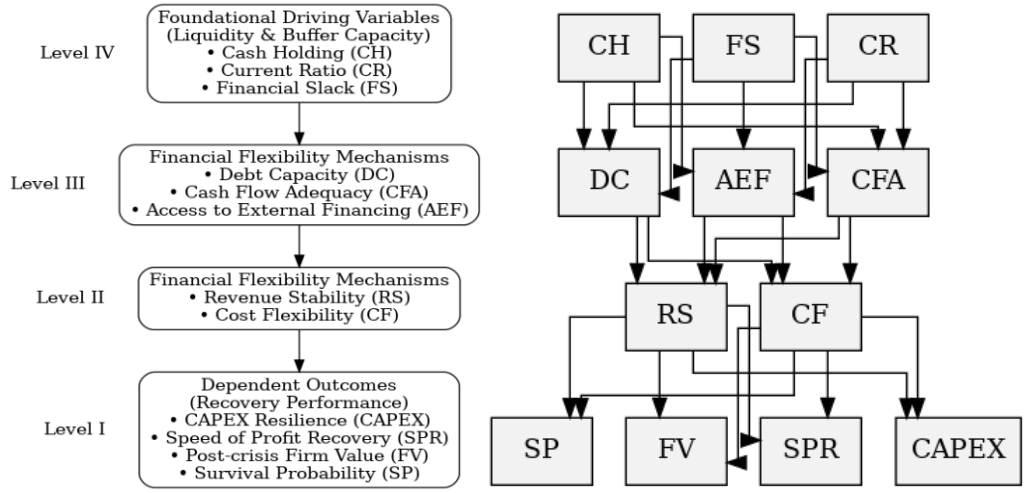
11 and dependence power of 2, and Financial Slack (FS) with a driving power of 10 and dependence power of 3. These findings indicate that liquidity and financial buffer capacity constitute the principal structural drivers of corporate resilience. In contrast, Debt Capacity (DC), Cash Flow Adequacy (CFA), Access to External Financing (AEF), Revenue Stability (RS), and Cost Flexibility (CF) demonstrate relatively high driving and dependence power, suggesting that they function as intermediary determinants linking financial resources to organizational resilience. Meanwhile, CAPEX Resilience (CAPEX), Speed of Profit Recovery (SPR), Post-crisis Firm Value (FV), and Survival Probability (SP) display relatively low driving power but high dependence power, indicating that they represent organizational outcomes resulting from the interactions among upstream determinants. These driving and dependence values provide the analytical foundation for the subsequent transitivity analysis, ISM level partitioning, and MICMAC classification.

Figure 5. ISM Digraph of Corporate Resilience Determinants



Source: Data processed by the author (2026)

Following the construction of the Initial Reachability Matrix, the transitivity principle was applied to derive the Final Reachability Matrix. The transitivity analysis did not alter the overall structural configuration of the resilience system because the identified direct relationships already reflected the dominant causal pathways agreed upon by the expert panel. Based on the Final Reachability Matrix, reachability and antecedent sets were generated iteratively to determine the hierarchical levels of each determinant. The resulting level partition forms the basis for constructing the ISM digraph presented in Figure 5.

ISM Hierarchical Structure

Based on the Final Reachability Matrix, iterative level partitioning was conducted by comparing the reachability and antecedent sets of each determinant. Determinants whose reachability and intersection sets were identical were assigned to the highest hierarchical level and subsequently removed from the matrix. This procedure was repeated iteratively until all determinants were assigned to their respective hierarchical levels. The resulting four-level structure is presented in Table 6.

The MICMAC analysis confirms the hierarchical findings obtained from ISM. Cash Holding, Current Ratio, and Financial Slack are classified as driving variables, indicating their dominant influence within the resilience system. Debt Capacity, Cash Flow Adequacy, Access

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to External Financing, Revenue Stability, and Cost Flexibility occupy the linkage quadrant, reflecting their dual role as both influencing and influenced determinants. CAPEX Resilience, Speed of Profit Recovery, Post-crisis Firm Value, and Survival Probability are classified as dependent variables, whereas no autonomous variables are identified. The absence of autonomous variables indicates that all determinants are structurally interconnected within the proposed Corporate Resilience Architecture.

Table 6. ISM Hierarchical Levels of Corporate Resilience Determinants

ISM Level	Structure Role	Determinants
Level I	Dependent Outcomes (Recovery Performance)	CAPEX Resilience (CAPEX); Speed of Profit Recovery (SPR); Post-crisis Firm Value (FV); Survival Probability (SP)
Level II	Stability and Adaptability Mechanisms	Revenue Stability (RS); Cost Flexibility (CF)
Level III	Financial Flexibility Mechanisms	Debt Capacity (DC); Cash Flow Adequacy (CFA); Access to External Financing (AEF)
Level IV	Foundational Driving Variables (Liquidity & Buffer Capacity)	Cash Holding (CH); Current Ratio (CR); Financial Slack (FS)

Source: Data processed by the author (2026)

MICMAC Classification

MICMAC analysis complements the ISM hierarchy by classifying determinants according to their driving and dependence powers (Table 7 and Figure 5).

Table 7. MICMAC Quadrant Classification of Corporate Resilience Determinants

MICMAC Quadrant	Driving Power	Dependence Power	Determinants
Driving Variables	High	Low	Cash Holding (CH); Current Ratio (CR); Financial Slack (FS)
Linkage Variables	High	High	Debt Capacity (DC); Cash Flow Adequacy (CFA); Access to External Financing (AEF); Revenue Stability (RS); Cost Flexibility (CF)
Dependent Variables	Low	High	CAPEX Resilience (CAPEX); Speed of Profit Recovery (SPR); Post-crisis Firm Value (FV); Survival Probability (SP)
Autonomous Variables	Low	Low	None identified

Source: Data processed by the author (2026)

Liquidity-related variables are positioned within the Driving quadrant because they possess strong influence over the overall resilience system while exhibiting limited dependence on other determinants. Debt Capacity, Cash Flow Adequacy, Access to External Financing, Revenue Stability, and Cost Flexibility are classified as Linkage variables, reflecting their dual role as both influencing and influenced determinants. Recovery Performance indicators are consistently located in the Dependent quadrant, whereas no Autonomous variables are identified. In MICMAC analysis, the driving quadrant represents variables with high driving power and low dependence, indicating that they function as the primary drivers of the system. The linkage quadrant consists of variables with both high driving and high dependence power, reflecting their dual role as influential factors that are also highly affected by changes in other variables. The dependent quadrant includes variables with low driving power but high dependence, representing outcomes that are largely determined by other factors within the system.

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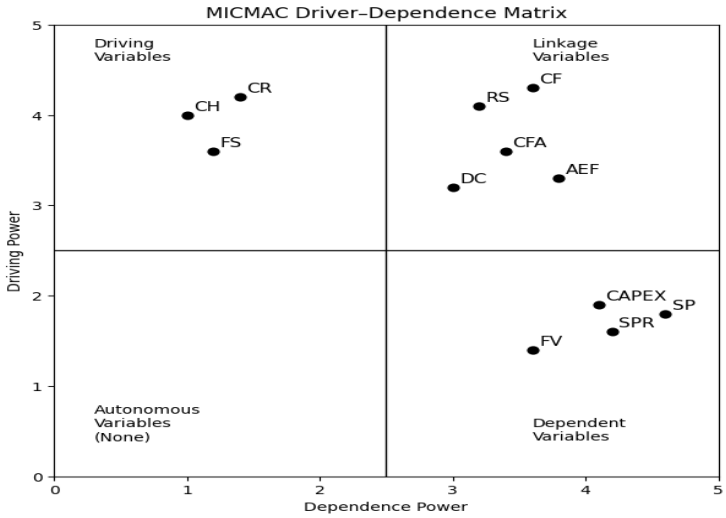
In contrast, the autonomous quadrant comprises variables with low driving and low dependence power, indicating weak interactions with the overall system. As shown in Figure 6, Cash Holding (CH), Current Ratio (CR), and Financial Slack (FS) are positioned in the driving quadrant, confirming their role as the fundamental drivers of corporate resilience. Debt Capacity (DC), Cash Flow Adequacy (CFA), Access to External Financing (AEF), Revenue Stability (RS), and Cost Flexibility (CF) are classified as linkage variables, highlighting their function as intermediary mechanisms that connect financial resources with organizational adaptability. Meanwhile, CAPEX Resilience (CAPEX), Speed of Profit Recovery (SPR), Post-crisis Firm Value (FV), and Survival Probability (SP) are located in the dependent quadrant, indicating that they represent the ultimate outcomes of the resilience process. No variables fall within the autonomous quadrant, suggesting that all determinants are structurally interconnected and collectively contribute to the development of corporate resilience.

Figure 6. MICMAC Driving-Dependence Matrix



Source: Data processed by the author (2026)

The absence of autonomous variables indicates that every determinant participates in the resilience system, reinforcing the interpretation that corporate resilience represents an integrated organizational capability rather than a collection of independent factors. Furthermore, the consistency between the ISM hierarchy and MICMAC classification strengthens the internal coherence of the proposed resilience architecture. The combined findings reveal a layered resilience architecture in which Liquidity and Buffer Capacity constitute the foundational driving layer, Financial Flexibility functions as the enabling mechanism, Stability and Adaptability translate financial capacity into operational continuity, and Recovery Performance emerges as the ultimate dependent outcome. Together, these results demonstrate that corporate resilience develops through sequential and interconnected organizational capabilities rather than isolated financial or operational determinants.

Robustness of Expert Judgments

To evaluate the reliability of expert judgments, this study employed Kendall's Coefficient of Concordance (W), a non-parametric statistic commonly used in ISM studies to measure the degree of agreement among experts (Kendall & Gibbons, 1990). In addition, a leave-one-

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expert-out sensitivity analysis was conducted to examine the stability of the proposed hierarchical model.

As shown in Table 8, the analysis yielded Kendall's W = 0.78 ($p < 0.01$), indicating strong agreement among the five experts. The statistical significance of Kendall's W was evaluated using the chi-square approximation, supporting the reliability of the Structural Self-Interaction Matrix (SSIM). Furthermore, the leave-one-expert-out sensitivity analysis produced an identical ISM hierarchy across all iterations, confirming that the proposed Corporate Resilience Architecture is robust and not dependent on the judgment of any individual expert. In each iteration, one expert was excluded while the remaining four experts reconstructed the ISM hierarchy.

Table 8. Robustness Assessment of Expert Judgments

Indicator	Result	Interpretation
Number of experts	5	Qualified academics and practitioners
Kendall's Coefficient of Concordance (W)	0.78	Strong expert agreement
Significance	$p < 0.01$	Agreement is statistically significant
Sensitivity analysis	Leave-one-expert-out	ISM hierarchy remained unchanged

Source: Data processed by the authors (2026)

Integrated Structural Findings

The integration of ISM and MICMAC results reveals a coherent structural architecture of corporate resilience. Liquidity and Buffer Capacity consistently emerge as foundational driving variables that initiate the resilience process. Financial Flexibility functions as an enabling mechanism linking financial resources to organizational adaptation, while Stability and Adaptability translate these financial capabilities into operational continuity. Recovery Performance occupies the final hierarchical layer, representing the cumulative outcome of upstream financial and operational capabilities. Taken together, these findings demonstrate that corporate resilience should not be interpreted as a set of independent organizational attributes. Instead, resilience develops through a sequential organizational process in which foundational financial resources enable financial flexibility, financial flexibility supports operational adaptability, and operational adaptability ultimately produces sustainable organizational recovery. This integrated structural pattern constitutes the Corporate Resilience Architecture proposed in this study.

Discussion

Corporate Resilience as a Hierarchical Organizational Capability

The findings demonstrate that corporate resilience should be understood as a hierarchical organizational capability rather than a collection of independent financial indicators. The ISM-MICMAC analysis reveals that resilience develops through sequential interactions among financial resources, adaptive capabilities, and recovery outcomes. This finding extends previous studies that primarily examined resilience using regression-based approaches by explaining not only whether resilience determinants are significant, but also how they interact within an integrated organizational system. Consistent with Organizational Resilience Theory, resilience emerges through the cumulative processes of anticipation, absorption, adaptation, and recovery rather than through isolated organizational actions (Duchek, 2020). Similarly, Hillmann and Guenther (2021) argue that resilience is a multidimensional capability requiring coordinated organizational responses across multiple functional areas. The absence of autonomous variables in the present study further supports this perspective, indicating that every determinant

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contributes to the resilience system and that sustainable recovery depends on the interaction of all organizational capabilities rather than on individual financial indicators alone.

Liquidity and Financial Flexibility as Foundational Drivers

Liquidity and Buffer Capacity constitute the strongest driving layer because they provide firms with the financial resources required to absorb uncertainty before strategic adaptation can occur. This finding supports the Resource-Based View, which emphasizes that valuable and controllable resources form the basis of sustainable competitive advantage (Barney, 1991). However, the present study extends this argument by demonstrating that liquidity represents only the first stage of resilience development. Financial resources become strategically valuable only when they are transformed into Financial Flexibility, enabling firms to access financing, maintain investments, and respond rapidly to external shocks. This interpretation is consistent with Financial Flexibility Theory (Gamba & Triantis, 2008) and empirical evidence showing that firms with stronger liquidity and financing capacity exhibited greater resilience during the COVID-19 pandemic (Acharya et al., 2021; Ding et al., 2021; Fahlenbrach et al., 2021). Therefore, liquidity should be viewed not merely as a financial buffer but as the foundation upon which subsequent organizational capabilities are developed.

Operational Adaptability as the Capability Transformation Mechanism

Revenue Stability and Cost Flexibility occupy the linkage level because they translate financial preparedness into operational continuity. This finding complements Dynamic Capabilities Theory, which argues that competitive advantage depends on an organization's ability to continuously sense environmental changes, seize opportunities, and reconfigure resources in response to uncertainty (Teece, 2007). Unlike previous studies that evaluated operational adaptability as an independent determinant, the present study demonstrates that operational adaptability functions as a transformation mechanism linking financial flexibility with recovery performance. This finding is also consistent with Hillmann and Guenther (2021), who emphasize that resilience depends on an organization's capacity to convert available resources into adaptive managerial actions. Consequently, firms with adequate financial resources but limited adaptive capability are unlikely to achieve sustainable resilience.

Recovery Performance as the Outcome of Sequential Capability Development

Recovery Performance, represented by CAPEX Resilience, Speed of Profit Recovery, Post-crisis Firm Value, and Survival Probability, forms the dependent layer of the resilience architecture. This indicates that organizational recovery should be interpreted as the cumulative outcome of preceding financial and operational capabilities rather than as an independent strategic objective. Organizational Resilience Theory similarly suggests that recovery reflects the effectiveness of anticipation, absorption, and adaptation processes undertaken before and during a crisis (Duchek, 2020; Burnard & Bhamra, 2011). Accordingly, organizations seeking long-term resilience should prioritize strengthening upstream financial and adaptive capabilities rather than focusing exclusively on short-term recovery indicators.

Synthesis of Findings

Overall, the findings support a Corporate Resilience Architecture in which organizational resilience develops sequentially from Liquidity and Buffer Capacity to Financial Flexibility, Stability and Adaptability, and finally Recovery Performance. This architecture extends existing resilience literature by shifting the analytical focus from identifying significant

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determinants toward explaining their structural interrelationships. The integration of the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory provides a comprehensive explanation of how financial resources are transformed into adaptive organizational capabilities that ultimately generate sustainable recovery. Beyond its theoretical contribution, the proposed architecture offers a practical framework for managers to prioritize capability development according to the structural importance of resilience determinants during periods of economic uncertainty.

Research Contributions

This study contributes to the corporate resilience literature by proposing the Corporate Resilience Architecture, which conceptualizes resilience as a hierarchical organizational capability that develops sequentially from Liquidity and Buffer Capacity, to Financial Flexibility, Stability and Adaptability, and ultimately Recovery Performance. By integrating the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory within an ISM-MICMAC framework, the study extends existing resilience research from identifying significant determinants to explaining their structural interrelationships. Methodologically, the study demonstrates a transparent and replicable qualitative structural modeling approach through systematic expert judgment, relationship screening, ISM hierarchy development, MICMAC classification, and robustness testing. Practically, the proposed architecture provides managers with a structured roadmap for prioritizing financial resources, strengthening adaptive capabilities, and improving organizational resilience during periods of economic uncertainty.

Implications

This study offers theoretical, managerial, and policy implications for strengthening corporate resilience during economic crises. Theoretically, it extends the corporate resilience literature by shifting the perspective from a variable centered approach to a structural systems perspective, demonstrating that resilience develops through a hierarchical sequence of organizational capabilities rather than independent organizational attributes. By integrating the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory within the ISM-MICMAC framework, the study provides a comprehensive explanation of how foundational financial resources evolve into adaptive capabilities and ultimately sustainable recovery. Methodologically, the findings illustrate that ISM-MICMAC complements conventional quantitative approaches by revealing hierarchical relationships and strategic roles that are not captured by regression-based analysis alone.

From a managerial perspective, the proposed Corporate Resilience Architecture provides a practical roadmap for capability development. Organizations should first strengthen liquidity and financial slack, followed by enhancing financial flexibility, improving revenue stability and cost flexibility, and finally evaluating resilience through recovery indicators such as CAPEX Resilience, profitability recovery, firm value, and long-term survival. This sequential approach enables firms to allocate financial and managerial resources more effectively during periods of uncertainty. For policymakers, the findings highlight the importance of promoting prudent liquidity management, sustainable financing, and broader access to long term capital. Policies that support firms in strengthening financial flexibility and adaptive capabilities are likely to enhance organizational preparedness, accelerate recovery, and improve long-term business sustainability during future economic disruptions.

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CONCLUSION

This study provides a structural perspective on corporate resilience during economic crises by demonstrating that resilience is not formed through isolated organizational capabilities but through a hierarchically integrated system of financial and operational determinants. Using the ISM-MICMAC approach, the study identifies Liquidity and Buffer Capacity as the primary driving layer that supports Financial Flexibility, which subsequently enables Stability and Adaptability before ultimately generating Recovery Performance as the final organizational outcome. The absence of autonomous variables further indicates that all resilience determinants are structurally interconnected and collectively contribute to organizational resilience. The principal theoretical contribution of this study lies in advancing the understanding of corporate resilience from a collection of independent determinants to a hierarchical resilience architecture. While previous studies have predominantly examined liquidity, financial flexibility, operational adaptability, and recovery performance as separate predictors using regression-based approaches, this study demonstrates that these determinants perform distinct structural roles within an integrated organizational system. By integrating the Resource-Based View, Dynamic Capabilities Theory, Financial Flexibility Theory, and Organizational Resilience Theory, the study explains how strategic financial resources are progressively transformed into adaptive organizational capabilities and ultimately into sustainable recovery outcomes.

From a methodological perspective, this research extends the application of Interpretive Structural Modeling integrated with MICMAC analysis in the corporate resilience literature. Rather than estimating direct causal relationships, the proposed framework identifies foundational driving variables, intermediary linkage mechanisms, and dependent recovery outcomes, thereby providing a richer explanation of the structural interdependencies underlying organizational resilience during economic crises. The findings also offer practical implications for corporate managers and policymakers. Resilience-building strategies should not focus solely on improving post-crisis performance but should prioritize strengthening foundational financial resources, enhancing financial flexibility, and developing adaptive operational capabilities in a sequential manner. Such an approach enables organizations to establish a more sustainable resilience system capable of anticipating, absorbing, adapting to, and recovering from future economic disruptions.

This study is subject to several limitations. The hierarchical relationships were derived from expert judgment within the ISM-MICMAC framework and therefore represent structural interpretations rather than statistically estimated causal effects. Future research is encouraged to validate the proposed resilience architecture using quantitative approaches, such as Structural Equation Modeling (SEM), panel data analysis, or longitudinal designs across different industries and institutional contexts. Additionally, future studies may incorporate emerging determinants, including digital transformation capability, artificial intelligence, environmental, social, and governance (ESG) practices, and organizational learning, to further refine the proposed corporate resilience architecture.

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