Business Strategy and the Environment

WILEY | Business Strategy and the Environment

RESEARCH ARTICLE OPEN ACCESS

From Vulnerability to Resilience: Dynamic Capabilities as a Moderating Mechanism Under Environmental Turbulence in Developing Economies

Edet Okon[1] | Morgan Morgan[2] | Fernando Almeida[3]

[1]Faculty of Business and Technology, School of Business, Management and Tourism, University of Sunderland in London, London, UK | [2]Department of Business Management, University of Calabar, Calabar, Nigeria | [3]School of Science and Technology, ISPGAYA, Vila Nova de Gaia, Portugal

Correspondence: Edet Okon (edet.okon@sunderland.ac.uk)

Received: 4 January 2026 | **Revised:** 3 April 2026 | **Accepted:** 14 May 2026

Keywords: capabilities | developing economies | environmental turbulence | learning and reconfiguring | sensing and seizing | strategic resilience

ABSTRACT

SMEs in developing economies operate under persistently volatile environments where economic instability, regulatory uncertainte and technological disruptions threaten their survival. Here, sustainability shifts from long-term environmental or socioeconomic performance to strategic resilience. In this study, we investigate how dynamic capabilities condition the effect of business environmental forces on SME sustainability in Nigeria. Grounded in contingency and dynamic capability theory, this study adopts a quantitative, cross-sectional survey design using data from 285 Nigerian SMEs. It examines the direct effects of economic, legal and technological environmental forces, as well as the moderating roles of sensing and seizing, and learning and reconfiguration capabilities, on SME strategic resilience using PLS-SEM. The results show that economic, legal and technological turbulence significantly affect SME strategic resilience, with legal turbulence emerging as the strongest constraint. Findings further reveal that dynamic capabilities–sensing and seizing, learning and reconfiguration–significantly moderate the effect of environmental turbulence on SME strategic resilience and strengthen SME capacity in absorbing shocks, reconfiguring resources and sustaining operations under disruptions. This study contributes by reframing SME sustainability as strategic resilience amid environmental turbulence, differentiating external pressures into economic, legal and technological dimensions, and showing how dynamic capability bundles condition SME strategic resilience in a highly volatile developing-economy context. This study offers insights relevant to other emerging economies characterised by institutional instability, policy unpredictability and uneven technological development. It also broadens understanding of contingency and dynamic capability theory in developing economies and positions dynamic capabilities as vital for resilience-building, not just competitive advantage.

1 | Introduction

Small and medium enterprises (SMEs) are widely recognised as engines of employment generation, innovation and economic growth in developing economies, including Nigeria (Mallett et al. 2018; Oluremi and Maku 2024). Despite extensive policy attention and the proliferation of support institutions such as the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), the National Directorate for Employment (NDE) and the Bank of Industry (BOI), the SME failure rate in Nigeria remains persistently high, with many unable to survive beyond their first 5 years (Kayode and Ilesanmi 2014; Gumel and Bardai 2021; PwC Nigeria 2024). Globally, empirical evidence on SME survival reported median SME survival time in European and Asian developing economies to be between 8 and 19 weeks, with above 67% fighting for survival amidst the availability of high incentives (Bosio et al. 2020; World Economic Forum 2022; Senin et al. 2024; Hawach and

Requejo 2025). This paradox of abundant policies' visibility and weak enterprise survival suggests that SME sustainability in developing economies cannot be explained solely by the presence of support programmes, formalisation efforts or general growth initiatives. Rather, it raises a more fundamental question: why do some SMEs remain viable under persistent environmental disruption while others fail under the same conditions?

This question, though prominent in developing economies, is significantly salient in Nigeria. Nigerian SMEs operate amid persistent macroeconomic volatility, regulatory inconsistency, infrastructural constraints and rapid but uneven technological change. More significant are inflationary pressures, high and unstable exchange rates and interest rates, compliance uncertainty, poor energy and logistics infrastructure and accelerating digital demands, all of which combine to create an environment in which disruption is not episodic but structural (Ogunmuyiwa and Adetayo 2023; PwC Nigeria 2024; Dipeolu et al. 2024). From a contingency perspective, these conditions are significant because SME outcomes depend on the alignment between internal strategic arrangements and external environmental demands (Volberda et al. 2012; Prajogo 2016; Verdu-Jover et al. 2026). SMEs unable to achieve such alignments become vulnerable to repeated disruptions, and their sustainability is less a matter of stable equilibrium performance but of strategic resilience. Resilience in the sense that their ability to remain viable, compliant and adaptive under sustained turbulence could be eroded. Nigeria is therefore not treated here as a convenient empirical setting, but as a theoretically revealing, highly turbulent developing-economy context in which the relationship between Environmental Turbulence (ET), adaptive capability and SME resilience can be observed more clearly. Furthermore, insights from this context could reveal patterns existing in other developing economies or countries characterised by similar institutional instability, policy unpredictability and uneven technological diffusion.

A number of studies have provided an important foundation: environmental conditions influence SME performance and sustainability. However, they remain fragmented in ways, leaving this phenomenon underexplained. One stream of studies examines how external environmental conditions affect SME performance or sustainability, yet often does so in broad or largely descriptive terms, emphasising business conditions, environmental scanning or sustainability orientation without explaining why some SMEs remain viable while others fail under similar pressure (Majid et al. 2019; Cheraghalizadeh et al. 2021; Amoako and Boateng 2022; Belgibayeva et al. 2022; Hawach and Requejo 2025). The second stream highlights the adaptive value of dynamic capabilities (DCs), especially sensing, learning and reconfiguring capabilities, but much of this work leaves out the seizing capability, with most studies focusing on large firms, relatively stable institutional contexts and/or general performance outcomes rather than SME resilience in turbulent developing economies, and also offering limited insights into how DCs function under severe ET (Alshanty and Emeagwali 2019; Reimann et al. 2021; Sharfaei et al. 2023; Sinha et al. 2023; Valdez-Juárez et al. 2023). The third stream had discussed SME sustainability, but frequently treats it as performance continuity or environmental responsibility, without sufficiently recognising that, in high-volatility settings, sustainability may be more appropriately understood as strategic resilience rather than mere compliance fulfilment (Ifekwem and Adedamola 2016; Malesios et al. 2021; Abdissa et al. 2022). Despite their significance, few studies examine these forces side by side, and even fewer investigate how SMEs in developing economies develop resilience in response to them.

These limitations leave three issues insufficiently addressed by the literature. First, the unclear establishment of how SME sustainability should be conceptualised under persistent ET. Second, environmental forces are often treated as broad or undifferentiated contextual variables, even though SMEs are unlikely to experience all dimensions of the forces' disruption or turbulence in the same way. This is concerning particularly for SMEs in developing economies, where economic, legal and technological ET appear to be the most immediate and operationally disruptive, yet they are rarely examined side by side within a single explanatory framework (Blundel et al. 2013; Sigcha et al. 2021; Radičić and Petković 2023; Dayioglu et al. 2024). Thirdly, the current position in the literature has not clearly established whether DCs merely support adaptation in a general sense or condition the strength of the relationship between ET and SME resilience.

This study addresses these gaps by conceptualising SME sustainability as strategic resilience–the capacity to remain viable, adaptive and compliant operations despite persistent ET. Therefore, reframing sustainability as resilience rather than solely environmental responsibility, realign this concept with the lived reality of SMEs in developing economies, where survival depends on continuously navigating volatility. Secondly, we focus on economic, legal and technological turbulence as the most immediate and consequential sources of environmental pressure for SMEs in developing economies. Economic turbulence affects liquidity, financing conditions, cost structures and demand stability (Kebede and Simesh 2015; Suryana 2016; Ogunmuyiwa and Adetayo 2023; Dayioglu et al. 2024). Legal turbulence shapes compliance burdens, administrative continuity and institutional legitimacy through regulatory change and enforcement inconsistency (Ufua et al. 2020; Blundel et al. 2013; Radičić and Petković 2023; Dipeolu et al. 2024). Technological turbulence alters competitive dynamics and raises the capability threshold required for SMEs to remain relevant and productive (Adam and Alarifi 2021; Vrontis et al. 2022; Valdez-Juárez et al. 2023; Budianto et al. 2023). Third, we conceptualised DCs as moderating mechanisms that condition the strength of ET's effect on SME strategic resilience. We draw on the contingency theory (CT) to explain why turbulence matters, while relying on dynamic capability theory (DCT) to explain how SMEs respond when ET disrupt strategic alignment. Accordingly, this addresses two questions.

1. What is the effect of economic, legal and technological environment turbulence on SMEs' strategic resilience in a volatile developing economy context?
2. To what extent do sensing and seizing capabilities, and learning and reconfiguration capabilities, moderate these effects?

The major contributions of this study are the following: (1) It advances SME sustainability research by reframing sustainability as strategic resilience under ET. (2) It extends dynamic capability research by illustrating how different capability bundles condition the effect of differentiated external environmental pressures on SME strategic resilience, rather than treating DCs or environmental forces as single, uniform entities. It also promotes an empirically grounded approach to assessing when DCs genuinely improve resilience. (3) It provides empirical evidence from Nigerian SMEs while also offering replicable insights relevant to other emerging and developing economies or countries characterised by institutional instability, policy unpredictability and uneven technological development.

The remaining part of this paper is structured as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 presents the methods and data. Section 4 reports the empirical results. In Section 5, the chapter concludes with a discussion of the findings and their theoretical, managerial and policy implications, as well as limitations and directions for future research.

2 | Theoretical Background and Hypotheses Development

In this study, two theories underpin the examination of environmental turbulence and SME resilience in developing countries. A major advantage of these theories' contextualisation is that we gained valuable insights into the unique areas of SME vulnerability and opportunity, and contribute to efforts to advance SME and economic resilience in emerging economies with similar institutional and economic characteristics.

2.1 | Contingency Theory (CT), DCT and ET

In this study, CT is used as the anchor theory. According to Galbraith (2002, 2014), there is no single organisational structure, strategy or resource configuration that is universally effective across contexts. Rather, organisations, such as SMEs, derive outcomes from the degree of fit between their internal and external environments (Volberda et al. 2012; Prajogo 2016). The implication is that organisational strategies, methods and structural changes are contingent on the SME's related environmental demands and conditions. This is why, in strategic management, the environment is treated as a critical contingent: changes in external conditions can alter the requirements for effective organisational action (Pyper et al. 2022; Verdu-Jover et al. 2026). Therefore, this perspective becomes particularly relevant to SMEs in developing economies, including those in Nigeria, where firms operate under unstable, shifting conditions, persistent macroeconomic volatility, regulatory inconsistency, infrastructural constraints and rapid but uneven technological changes that continually test their viability (PwC Nigeria 2024; Oluremi and Maku 2024). These conditions make ET a central contingency condition rather than a passive background factor. As a result, SME sustainability cannot be fully understood in terms of growth, continuity or environmental responsibility, but better interpreted as strategic resilience–the capacity to remain viable, compliant and adaptive under recurrent disruption (Majid et al. 2019; Cheraghalizadeh et al. 2021; Shahzad and Arslan 2023).

From a broader contingent perspective, SME operations are shaped by external environmental factors, including political, economic, social, technological, environmental and legal forces, collectively known as PESTLE (Aguilar 2008; Siyanbola 2020; Gini and Agala 2023). However, these forces do not exert uniform pressure across firms or contexts. The PESTLE as analytical framework is useful for external pressure scanning and classification tool rather than an exploratory framework (Amoako and Boateng 2022; Belgibayeva et al. 2022; Ghag et al. 2023). Such a limitation is where the CT foregrounds the exploratory logic of this study, giving insights into why ET affects SME outcomes. Given the recognised significance of CT, this study treats economic, legal and technological turbulence as the most immediate and operationally consequential dimensions of environmental pressures on SMEs in developing economies (Sigcha et al. 2021; Radičić and Petković 2023; Dayioglu et al. 2024). While the CT can only explain why ET matters, the DCT explains how firms respond when strategic alignment is disrupted. Dynamic capabilities in this context refer to SMEs' ability to sense, seize, learn, and reconfigure internal and external competencies under challenging conditions (Teece et al. 1997; Teece 2018). In this study, DCT extends CT by explaining the firm-level mechanisms through which SMEs attempt to build resilience under turbulence. SMEs' sensing and sizing capabilities could support timely recognition of turbulence and responses, while learning and reconfiguration capabilities support deeper adaptive adjustments and renewal of strategies (Reimann et al. 2021; Valdez-Juárez et al. 2023; Taghizadeh et al. 2023). This logic clarifies the later model by theorising DCs as moderators of environmental turbulence rather than mediators, because DCs do not transmit the effect of turbulence on resilience but rather condition the strength with which each form of turbulence affects SMEs' strategic resilience.

2.2 | Environmental Forces and SME Strategic Resilience (SME Sustainability)

2.2.1 | Economic Environmental Turbulence and Strategic Resilience

From a contingency perspective, economic turbulence represents a major contingency condition for SMEs because inflation volatility, interest-rate fluctuations, exchange-rate instability, financing constraints and demand uncertainty. All of which can quickly disrupt SMEs' internal resource arrangements and external market conditions. For SMEs, such unprecedented fluctuations and pressures directly affect liquidity, purchasing power, production cost and access to credit, thereby constraining operational continuity and strategic flexibility (Adeoye 2013; Kebede and Simesh 2015; Ogunmuyiwa and Adetayo 2023). Consistent economic instability weakens organisational agility and limits SMEs' capacity to develop adaptive capabilities for sustainability (Reed 2021; Asumah et al. 2024). At the same time, previous research has suggested that economic turbulence does not affect SMEs equally. Despite constraining performance, it may, for some SMEs, stimulate efficiency-driven innovation and strategic adjustment among firms

that possess sufficient adaptive capacity (Bakos et al. 2020; Hernita et al. 2021; Malesios et al. 2021; Opoku 2025; Helhel and Helhel 2026). In the consequential contingency terms, economic turbulence is not merely a hostile background condition but a structural stressor that tests whether a firm can maintain resilience under financial and market instability. In this study, economic turbulence is expected to shape the extent to which SMEs can sustain operations and remain strategically resilient over time. Accordingly, the first hypothesis is proposed.

H1. *Economic environmental turbulence has a significant effect on SMEs' strategic resilience.*

2.2.2 | Legal Environmental Turbulence and SME Strategic Resilience

Legal environment turbulence refers to instability and unpredictability in laws, regulations and enforcement mechanisms governing business activity (Ufua et al. 2020; Peprah et al. 2024). It includes changes in taxation, business registration requirements, labour rules, health and safety obligations, licensing procedures, waste management regulations and intellectual property protection. In developing economies, legal turbulence is often intensified by inconsistent enforcement, overlapping mandates and administrative complexity, which create significant compliance burdens for SMEs (Adam and Alarifi 2021; Blundel et al. 2013; Tyler et al. 2023). From the contingency viewpoint, legal turbulence alters the institutional conditions under which SMEs must remain legitimate and operational. The implication is that SMEs must maintain strategic fit not only with market conditions but also with shifting regulatory expectations. Where firms lack the routines, knowledge or administrative flexibility needed to manage these changes, legal turbulence may crowd out investment in adaptive capability and divert scarce resources toward compliance survival rather than strategic adaptive capability (Reed 2021; Dipeolu et al. 2024). Prior studies show mixed outcomes: legal structure may enable continuity where regulatory clarity exists but may undermine resilience where compliance complexity is high (Belgibayeva et al. 2022; Permatasari and Gunawan 2023). This study, therefore, treats legal turbulence as a distinct contingency pressure shaping SMEs' ability to remain compliant, legitimate and resilient. The second hypothesis is stated as follows:

H2. *Legal environmental turbulence has a significant effect on SMEs' strategic resilience.*

2.2.3 | Technological Environmental Turbulence and SME Strategic Resilience

Technological turbulence reflects the pace and scope of technological changes affecting business operations, including digitalisation, automation, artificial intelligence and ICT development and related innovation pressures (Chen et al. 2011; Nambisan et al. 2019; Adam and Alarifi 2021). For SMEs, these changes become consequential as they alter competitive expectations, customer requirements and operational processes. In contingency terms, technological turbulence modifies the external demands to which firms must adapt internal resources in order to remain resilient (Budianto et al. 2023). Although technological changes can improve productivity, innovation outcomes and market reach, such benefits are not automatic. Most significantly, resource constraints, limited absorptive capacity and skill shortages may prevent SMEs from adopting and exploiting new technologies effectively (Ebabu 2012; AlZayani et al. 2023; Sagala and Őri 2025). Contrary to this view and the inherent mix of findings of prior studies, technological capability can strengthen competitiveness and sustainability during periods of disruption, but they also suggest that technological changes increase the minimum adaptive threshold required for SMEs to remain relevant (Chege and Wang 2020; Alraja et al. 2022; Vrontis et al. 2022; Radičić and Petković 2023; Ozturk et al. 2024). Given these mixed findings, this study conceptualises technological turbulence as a disruptive contingency condition that affects SMEs' ability to sustain market relevance and operational continuity, particularly during rapid technological change. Hence, the third hypothesis is proposed:

H3. *Technological environmental turbulence has a significant effect on SMEs' strategic resilience.*

2.3 | Dynamic Capabilities as Moderators of Environmental Turbulence

In a contingently turbulent business environment that can disrupt alignment between SMEs and their operating conditions, the central question becomes whether some SMEs are better capable than others to restore operational resilience. This is where dynamic capability directly addresses this question. DCT posits that firms must be able to integrate, build and reconfigure internal and external competencies to address rapidly changing environments (Teece et al. 1997; Teece 2018). It emphasises adaptability, meaning that SMEs could initiate an adaptive process of sensing and seizing, learning and reconfiguring as resilience-mitigation mechanisms in response to environmental turbulence. For resource-constrained SMEs in turbulent, developing economies, these capabilities are critical because they determine whether ET leads to vulnerability, stagnation or adaptive continuity. Hence, DCs are not treated as direct transmitters of ET effects in this study. Rather, they are conceptualised as moderating mechanisms that condition the strength of ET's effect on SME strategic resilience. The implication is that, while CT explains why ET matters, DCT explains how SMEs respond when strategic fit is disrupted. Altogether, this logic presents a major advantage and a forward-looking conceptualisation of DCs as firm-level adaptive capabilities and as a moderating model rather than a mediation model. Furthermore, a moderation model is particularly useful, as a mediation model specification would imply that environmental turbulence first generates dynamic capabilities and that those capabilities then transmit their effects to resilience, which is not the case (Schilke 2014; Kurtz and Varvákis 2016; Turulja and Bajgoric 2019). Consequently, we advance DCs as a strategic-fit restoring mechanism that alters the strength of the relationship between ET and SME strategic resilience.

From a resilience perspective, DCs constitute a meta-capability that supports anticipation, coping and adaptation amid turbulence (Duchek 2020; Taghizadeh et al. 2023). In other words,

ET creates contingency pressure, while DCs condition/moderate the extent to which ET affects SME strategic resilience by mitigating ET pressure, strengthening adaptive responses and acting as fit-restoring mechanisms under turbulence and build resilience under it. Therefore, in SMEs operating under resource constraints and institutional instability, such capabilities are particularly important because resilience depends less on static resource endowments and more on the ability to renew, redeploy and align those resources as environmental conditions change, as in Nigeria and other developing economies.

Sensing and seizing capabilities represent SMEs' ability to detect, interpret and respond to shifts in demand, regulation and technology before they escalate into operational destabilisation (Teece 2018; Müller et al. 2021; Zahoor et al. 2022). This capability conversion process involves market scanning, regulatory awareness, technological monitoring and timely resource mobilisation. Within a resilience framing, sensing and seizing are expected to reduce immediate exposure to turbulence by enabling proactivity rather than reactive adaptation. Meaning that SMEs can anticipate changes in demand, regulation and technology and mobilise resources accordingly (Rodrigues et al. 2021; Kump and Schweiger 2022; Pertheban et al. 2023). SMEs that sense environmental changes early and seize relevant opportunities promptly are therefore more likely to absorb shocks without severe disruption to continuity (Teece et al. 2016; Alshanty and Emeagwali 2019). Accordingly, it is expected that sensing and seizing capabilities will strengthen SMEs' resilience under turbulent environmental conditions.

Learning and reconfiguring capabilities, by contrast, support deeper adaptive renewal. They reflect SMEs' ability to acquire and apply knowledge, modify routines, redeploy resources and restructure operations when existing arrangements are no longer effective in evolving environmental conditions (Reimann et al. 2021; Valdez-Juárez et al. 2023; Haputhanthri et al. 2024). For SMEs operating under institutional uncertainties and resource constraints, these capabilities underpin resilience by enabling recovery, adjustment and continuity rather than mere growth optimisation. In the contingent time, while learning capability helps SMEs understand ET, reconfiguration capability helps in the application and redeployment of resources to address strategic misfit (Pervan et al. 2018; Eikelenboom and De Jong 2019; Al-Hawary and Alanazi 2023). Firms with strong learning mechanisms demonstrate greater flexibility and continuity during periods of uncertainty (Kareem and Alameer 2019; Gutiérrez-Rodríguez et al. 2020; Tolstoy et al. 2022; Bassey 2023). In this sense, learning and reconfiguration do not simply improve performance; they strengthen the firm's capability to remain viable when ET makes previous operating arrangements inadequate (Belitski and Khalil 2020; Ayang 2022; Hadi 2023). Taken together, DCs are expected to condition, not eliminate, the effect of ET. When sensing and seizing support, short-cycle responsiveness, learning and reconfiguration support deeper structural adaptation over time. Thus, SMEs with strong DCs should be better positioned to maintain viability and continuity under economic, legal and technological turbulence. Accordingly, the following hypotheses are proposed (Figure 1).

H4. *Sensing and seizing capabilities moderate the relationship between environmental turbulence and SMEs' strategic resilience.*

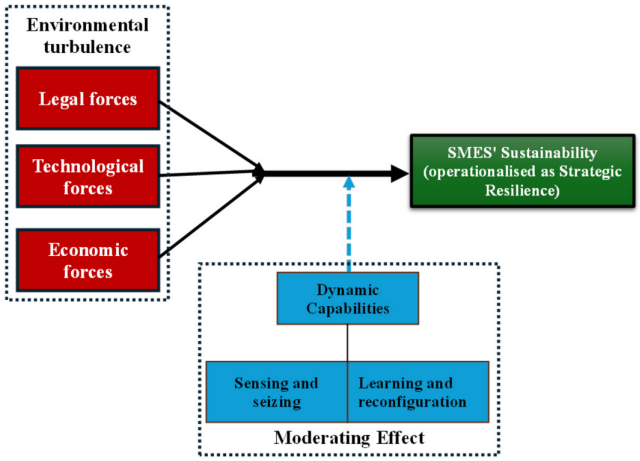

FIGURE 1 | Conceptual framework.

H5. *Learning and reconfiguration capabilities moderate the relationship between environmental turbulence and SMEs' strategic resilience.*

3 | Methods and Data

3.1 | Research Design and Context

This study used a quantitative, cross-sectional survey to examine how environmental turbulence affects SME sustainability and the moderating role of dynamic capabilities on this relationship. This approach is suitable because these factors are firm-specific and experiential phenomena and are best assessed through owner–manager perceptions, especially under uncertainty (Teece 2007; Amoako and Boateng 2022; Dayioglu et al. 2024). Surveys are also commonly used to collect data on SMEs' strategic responses to environmental volatility. The empirical context is in Akwa Ibom State, Nigeria, a developing regional economic hub with macroeconomic volatility, regulatory uncertainty, infrastructure issues and rapid technological change. These conditions, characterised by heightened turbulence, make the focus on strategic resilience appropriate rather than long-term equilibrium performance (Valdez-Juárez et al. 2023; Bassey 2023).

3.2 | Sampling and Data Collection

The target population comprised 1093 registered SMEs from the Small and Medium Enterprise Development Agency of Nigeria (SMEDAN) database (2015). This approach provides a reliable sampling frame for formal SMEs. A pilot with 20 SMEs in Cross River State was conducted to assess the clarity and relevance of the data instruments, but no statistical inferences were drawn. A target sample size of 285 was set using Krejcie and Morgan's (1970) simple random sampling table. Environmental turbulence, dynamic capabilities and strategic resilience are firm-level experience constructs that are most appropriately captured through owner–manager perspectives. Therefore, data were collected from owners and managers involved in decision-making and exposed to environmental pressure. Between June and November 2025, trained

assistants gathered data, yielding 270 usable responses, a 94% response rate.

3.3 | Measurements and Variables

All constructs were adapted from prior studies and measured using a multi-item scale on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). Table 1 presents the measurement items, sources and descriptive statistics for all constructs. Environmental forces included economic, legal and technological dimensions, reflecting key sources of turbulence in developing countries (Sigcha et al. 2021; Amoako and Boateng 2022; Ogunmuyiwa and Adetayo 2023; Dayioglu et al. 2024). Economic forces covered macroeconomic instability and market volatility; legal forces included regulations and compliance requirements; and technological forces included digitalisation and ICT disruptions. Dynamic capabilities included sensing and seizing, and learning and reconfiguration, measuring environmental scanning, opportunity recognition, organisational learning and resource redeployment (Teece 2007). SME sustainability was operationalised as strategic resilience, emphasising adaptability and viability amid turbulence, aligning with DCT (Teece 2018; Reimann et al. 2021; Adomako et al. 2025).

The initial analysis of the respondents indicated that 73.4% of the managers and owners of SMEs were male, while 26.6% were female. Furthermore, 70% of respondents were aged 35 to 50 and 30% were over 50. The demographic analysis also revealed that 75.7% of SME owners and managers held a bachelor's degree or higher, while 24.3% held an HND or lower qualification. The descriptive statistics presented in Table 1 indicate that the mean and standard deviation for all constructs were satisfactory.

3.4 | Method bias and Validity Assessment

All constructs were measured via a self-reported survey. To reduce common method bias, anonymity and careful wording were introduced to reduce bias and ease comprehensiveness. Full collinearity VIFs below 3.3 indicated minimal bias among latent variable models. Composite reliability was above thresholds, confirming internal consistency across constructs. Convergent validity: AVE surpasses 0.50, while discriminant validity was conducted using the heterotrait–monotrait (HTMT) ratio, which was below the threshold, therefore confirming measurement validity.

3.5 | Data Analysis

Since the study focuses on theory extension, including interaction effects, and examines complex relationships under conditions of environmental turbulence, PLS-SEM was employed to test the direct effects of environmental turbulence on SME strategic resilience. This method was selected because it allows us to prioritise prediction and strengthen CT and DCT development (Guenther et al. 2023). Thirdly, the moderating effects of dynamic capabilities were tested using interaction items. All variables were mean-centred to reduce multicollinearity prior to introducing interaction constructs.

4 | Results

Structural equation modelling (SEM) using Smart-PLS 3 software was employed to test the proposed hypotheses. The analysis followed a two-stage procedure, beginning with the assessment of the measurement model and then the evaluation of the structural model.

4.1 | Measurement Model Assessment

The model assessment results reported in Table 2 establish construct reliability and validity, in accordance with established PLS-SEM evaluation criteria (Hair et al. 2019). All indicators demonstrate satisfactory standardised factor loadings (SFL >0.70). The composite reliability (CR >0.50) exceeds the recommended threshold, confirming internal consistency across constructs. While the average variance extracted (AVE >0.50) indicates convergent validity for all constructs.

Additionally, full collinearity variance inflation factors (VIFs) were below 4.0 conservative thresholds (Hair et al. 2019), suggesting no serious multicollinearity concerns and indicating that common method bias was unlikely to have materially affected the results. Figure 2 presents the PLS measurement model, which is used to display the standardised indicator loading and construct relationships underlying the assessment of reliability and validity.

Discriminant validity was assessed using the HTMT as shown in Table 3; values were below the conservative threshold of 0.90, confirming adequate construct distinctiveness (Henseler et al. 2014).

4.2 | Structural Model Results

The structural model was assessed using bootstrapping with two-tailed significance testing. Path coefficients (β), t-values, p-values and confidence intervals are reported in Table 4. Figure 3 presents the PLS-SEM structural model showing the hypothesised relationships among the latent constructs, including the moderating effect of dynamic capabilities.

The PLS-SEM result for hypothesis one indicates that H1: economic and environmental turbulence have a strong, positive effect on SME strategic resilience ($\beta = 0.667$, $t = 5.342$, $p < 0.001$). This indicates that macroeconomic instability, as captured by inflation, financing constraints, labour costs and market volatility, is a central factor shaping SMEs' ability to maintain operations amid disruption.

Similarly, H2: legal environmental turbulence shows a significant effect on SME strategic resilience ($\beta = 0.734$, $t = 6.983$, $p < 0.001$). This finding reveals that regulatory complexity, tax pressures and compliance demands are dominant external constraints affecting SMEs' operational continuity and strategic resilience. H3: The technological environmental turbulence demonstrated a significant effect on SME strategic resilience with ($\beta = 0.512$, $t = 7.453$, $p < 0.001$), indicating that digitalisation

TABLE 1 | Measurement instrument showing descriptive statistics.

Constructs	Items codes	Items	Sources	Mean	SD
Economic factor (EF)	EF1	To what extent do economic fluctuations (such as inflation, interest rates and GDP growth) influence the sustainability of SMEs	Bassey (2023), Ayang (2022)	4.231	0.056
	EF2	To what extent do access to financial resources and funding options significantly affect the sustainability of SMEs against economic shocks		4.143	0.087
	EF4	To what extent do the availability of skilled labour and its cost influence the sustainable growth of SMEs		4.321	0.084
	EF6	How do changes in exchange rates and international trade policies impact the competitiveness and sustainability of SMEs		4.153	0.087
	EF7	Do economic uncertainties and market volatilities necessitate dynamic adaptation strategies by SMEs to maintain sustainability		4.012	0.453
Legal factor (LF)	LF1	To what extent do environmental protection laws (waste management regulations) influence SME sustainability	Ebabu (2012) Bassey (2023), Ayang (2022), Siyanbola (2020)	4.532	0.054
	LF3	How do changes in government policies regarding business registration requirements and renewal of licenses impact the ability of SMEs to sustain themselves in dynamic economic environments.		4.432	0.063
	LF4	How do employment laws impact the ability of SMEs to recruit a skilled workforce to sustain their operations.		4.112	0.073
	LF5	To what extent do taxation laws affect the sustainability of SMEs		4.101	0.088
	LF7	To what extent do health and safety regulations impact SMEs' sustainability		4.161	0.075

(Continues)

TABLE 1 | (Continued)

Constructs	Items codes	Items	Sources	Mean	SD
Technological factor (TF)	TF1	To what extent do technological innovations influence SMEs' sustainability	Chen et al. (2011) Bassey (2023)	4.521	0.074
	TF3	How does the level of automation and digitalisation impact the ability of SMEs to sustain their operations amidst environmental challenges.		4.011	0.084
	TF4	To what extent do the quality of information technology infrastructure and e-commerce platforms contribute to enhancing the sustainability of SMEs		4.221	0.213
	TF5	To what extent do the adoption of mobile technology and Internet of Things (IoT) solutions empower SMEs to respond effectively to environmental changes		4.001	0.064
	TF6	How do biotechnological advancements and the adoption of renewable energy technologies impact the sustainability of SMEs		4.351	0.053
SMEs sustainability (SUS): *operationalise as* ***strategic resilience***	SUS1	Our firm can sustain operations during periods of economic volatility, including inflation, demand fluctuations, interest rate changes or financing constraints.	Ifekwem and Adedamola (2016), Ayang (2022), Siyanbola (2020)	4.342	0.083
	SUS3	Our firm can maintain compliance and operations amid changes in laws, regulations or enforcement requirements.		4.732	0.089
	SUS5	Our firm can maintain competitiveness and operational continuity in response to rapid technological changes or digital disruptions.		4.544	0.093
	SUS7	Our firm can adjust strategies when unexpected external disruptions occur.		4.543	0.091
	SUS8	Our firm can recover from external disruptions without long-term adverse effects.		4.435	0.0891

(Continues)

TABLE 1 | (Continued)

Constructs	Items codes	Items	Sources	Mean	SD
Sensing and seizing (S&S)	S&S1	To what extent do SMEs perceive changes in their external environment that could impact their sustainability	Teece (2007), Belitski and Khalil (2020), Kareem and Alameer (2019), Pervan et al. (2018)	4.331	0.0843
	S&S2	How effective are SMEs in identifying opportunities, emerging market trends and competitive threats through environmental scanning		4.632	0.078
	S&S5	To what extent do SMEs possess the ability to quickly capitalise on identified opportunities to enhance sustainability		4.125	0.081
	S&S6	To what extent do SMEs allocate resources and adjust their design and strategies to seize opportunities and mitigate threats to sustainability		4.233	0.073
Learning and reconfiguration (L&R)	L&R1	We reconfigure and transform existing resources and strategies to address the prevailing changes in market conditions	Teece (2007), Rehman and Saeed (2015), Hawass (2010)	4.653	0.086
	L&R2	Our firm prioritises organisational learning processes to adapt to changing environmental forces		4.531	0.093
	L&R3	To what extent does the continuous acquisition of new knowledge through training influence SMEs' sustainability		4.453	0.073
	L&R4	Does the capacity to reallocate resources in response to changes in the external environment affect SMEs' sustainability		4.216	0.071

Source: Author's computation.

TABLE 2 | Measurement instrument convergent validity and reliability statistics.

Constructs	Items codes	SFL	AVE	CR	VIF
Economic factor (EF)	EF1	0.812			1.451
	EF2	0.793			
	EF4	0.864	0.591	0.890	
	EF6	0.792			
	EF7	0.718			
Legal factor (LF)	LF1	0.721			
	LF3	0.849			
	LF4	0.764	0.632	0.853	1.432
	LF5	0.875			
	LF7	0.865			
Technological factor (TF)	TF1	0.878			
	TF3	0.985			
	TF4	0.875	0.588	0.854	1.432
	TF5	0.892			
	TF6	0.878			
SMEs sustainability (SUS)	SUS1	0.877			
	SUS3	0.898			
	SUS5	0.784	0.587	0.894	1.421
	SUS7	0.933			
	SUS8	0.905			
Sensing and seizing (S&S)	S&S1	0.894			
	S&S2	0.787			
	S&S5	0.877	0.591	0.874	1.432
	S&S6	0.854			
Learning and reconfiguration (L&R)	L&R1	0.895			
	L&R3	0.865			
	L&R4	0.843	0.681	0.852	1.442
	L&R6	0.912			

Source: Author's computation.

pressure, automation demands and new technology adoption challenges shape SME capacity to adapt to environmental turbulence.

4.3 | Moderating Effect of Dynamic Capabilities

Furthermore, the results confirm the conditioning role of dynamic capabilities. H4: Sensing and seizing capabilities significantly moderate the relationship between environmental turbulence and SME strategic resilience ($\beta = 0.423$, $t = 4.546$, $p < 0.001$). This result implies that SMEs with strong sensing and seizing capabilities can identify environmental shifts and act on emerging threats and opportunities. Similarly, H5: learning and configuration capabilities exert a significant moderation effect ($\beta = 0.301$, $t = 4.432$, $p < 0.001$). This result indicates that SMEs that continuously invest in learning to acquire knowledge and reconfigure resources. Taken together, the moderation results indicate that these capabilities are most rewarding when environmental turbulence is sustained. However, these findings demonstrate that environmental forces do not uniformly determine SME outcomes. Instead, their effects on SME resilience are systematically conditioned by firm-level dynamic capabilities. This outcome supports the study's conceptualisation of sustainability as strategic resilience under environmental turbulence.

5 | Discussion

This study challenges the assumption that SMEs pursuing sustainability strategies automatically achieve sustainable outcomes. It examined how economic, legal and technological turbulence affect SME strategic resilience and how dynamic capabilities condition these relationships in a high-turbulence developing-economy context. The findings support all five hypotheses and yielded three main insights. First, ET is not a background condition for SMEs; it is a direct source of vulnerability. Second, its effects are differentiated rather than uniform, with legal turbulence exerting the strongest influence, followed by economic and technological turbulence. Third, dynamic capabilities do not mediate these relationships; they moderate them by conditioning the extent to which turbulence translates into resilience outcomes or vulnerability for SMEs. Viewing these outcomes through a contingency lens, the results suggest that SME resilience depends not only on external pressures but also on SMEs possessing the adaptive capabilities needed to respond effectively to rapidly changing conditions.

5.1 | Economic Environment Turbulence and SME Strategic Resilience

This study found that economic turbulence significantly affects SME strategic resilience. This finding is consistent with prior studies showing that inflation, credit constraints and exchange-rate and demand volatility weaken SME continuity and strategic flexibility (Kebede and Simesh 2015; Taiwo et al. 2013; Aladejebi et al. 2024). However, the present study extends this literature by showing that economic turbulence is not simply a destructive background force. It also serves as a differentiating condition that reveals which SMEs have sufficient adaptive capacity to absorb shocks and reallocate resources, and which do not. Perhaps the most unexpected outcome is that this study challenges the implicit view of SMEs as uniformly vulnerable to macroeconomic shocks, suggesting that adverse economic conditions mechanically translate into failure. In this sense, economic turbulence should be understood not merely as an external constraint on performance, but as a structural pressure that tests SMEs' ability to remain operational under instability. This interpretation aligns with Hernita et al. (2021) and Malesios et al. (2021), while shifting attention from performance decline alone to resilience-building amid sustained economic volatility. From a contingency perspective, it is safe to say that economic turbulence undermines the adequacy of

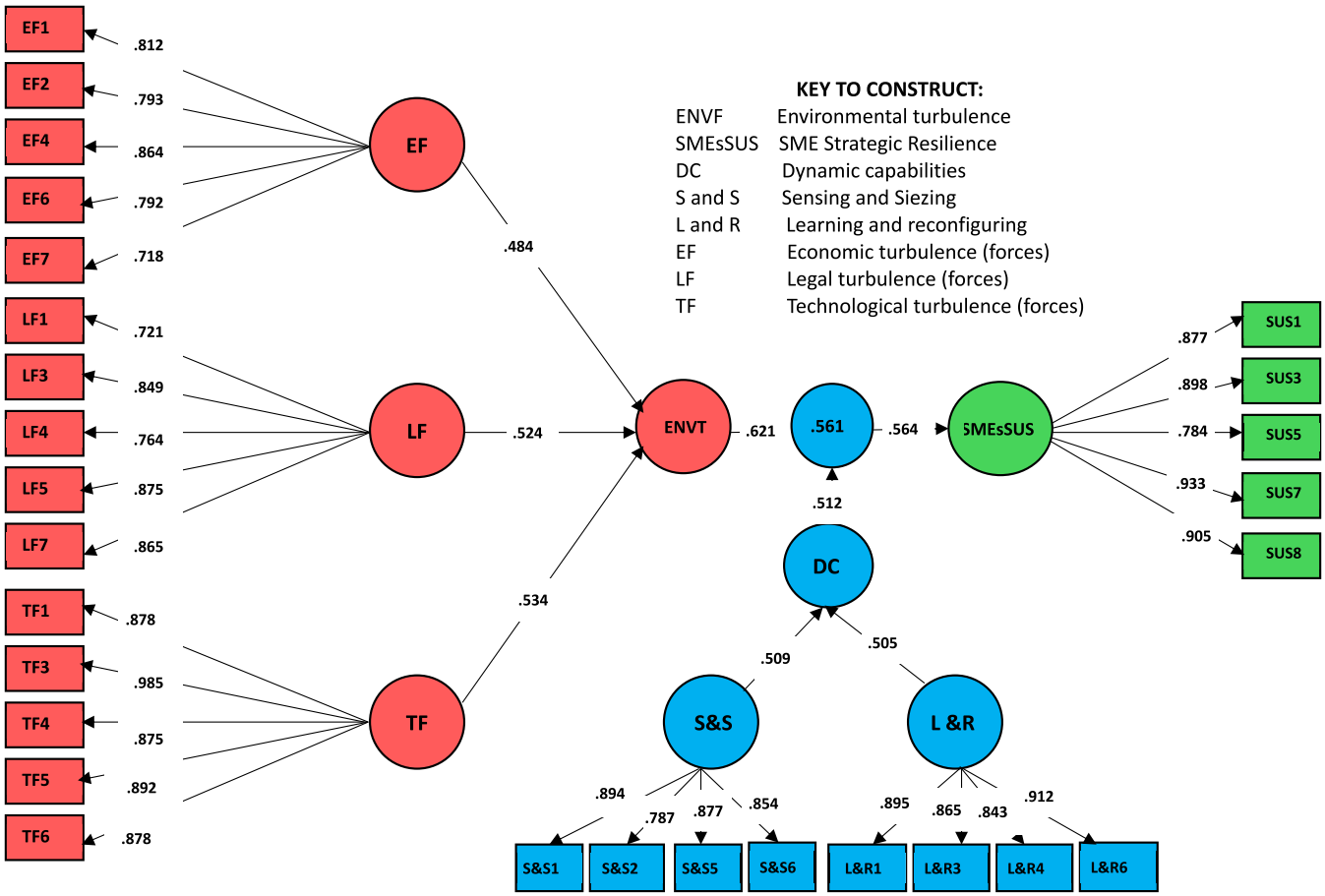

FIGURE 2 | PLS-SEM measurement model evaluation showing standardised indicator loading and construct relationships. *Source:* Author's computation.

TABLE 3 | HTMT ratio results.

Constructs	SMEs SUS	EF	LF	TF	S&S	L&R
SMEs SUS	_					
EF	0.752	_				
LF	0.523	0.742	_			
TF	0.665	0.683	0.761	_		
S&S	0.757	0.578	0.652	0.772	_	
L&R	0.613	0.686	0.594	0.674	0.765	_

Source: Author's computation.

TABLE 4 | Summary of hypotheses testing and moderating results.

Hypotheses	Relationships	β	*t*-value	*p*	Decision
H1	EF → SMEsSUS	0.667	5.342	0.000	Supported
H2	LF → SMEsSUS	0.734	6.983	0.000	Supported
H3	TF → SMEsSUS	0.512	7.453	0.000	Supported
H4	ENVF × S&S → SMEsSUS	0.423	4.546	0.000	Supported
H5	ENVF × L&R → SMEsSUS	0.301	4.432	0.000	Supported

Source: Author's computation.

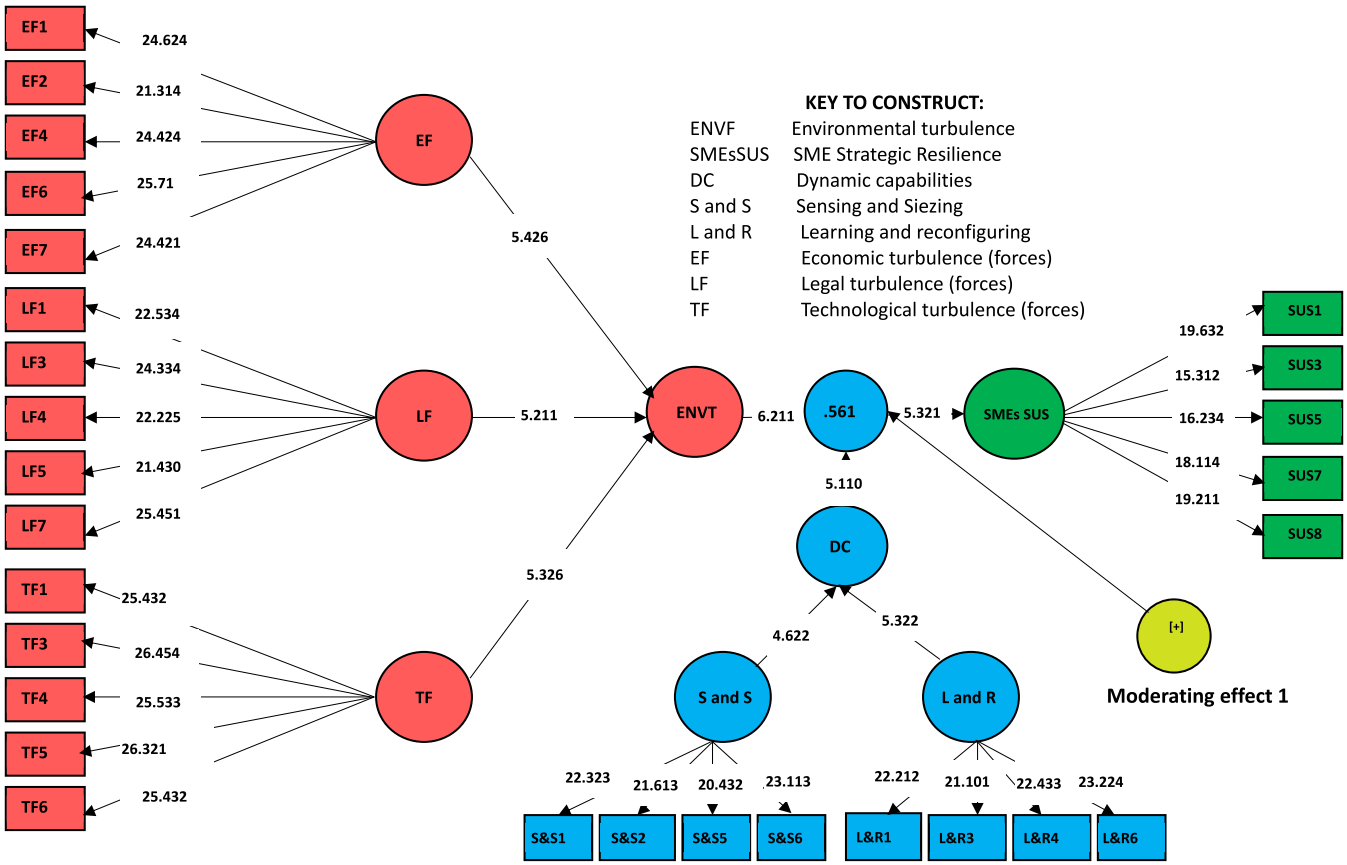

FIGURE 3 | PLS-SEM structural model result showing path coefficients and moderating effect *Source:* Author's computation.

SMEs' current financial and operational arrangements, making resilience contingent on SMEs' ability to adjust rapidly amid unstable cost and market conditions in developing economies.

5.2 | Legal Environmental Turbulence Effect on SME Strategic Resilience

The legal turbulence emerged as the strongest predictor of SMEs' strategic resilience. This suggests that, in the Nigerian context, regulatory instability may be more demanding to continuity than other forms of turbulence. This finding raises the bar to the critical importance of legal clarity and enforcement, crucial for SMEs to remain sustainable. Prior studies have shown that stable legal frameworks can support planning, legitimacy and continuity (Nyarku and Oduro 2017; Ufua et al. 2020). While this perspective holds under conditions of regulatory clarity, this paper's findings extend this view by showing that where enforcement is inconsistent, mandates overlap and regulations shift frequently, the legal environment becomes a persistent burden rather than a stabilising framework. This result collaborates with the findings of Blundel et al. (2013), Radičić and Petković (2023) and Permatasari and Gunawan (2023), but extends them by showing that legal instability actively drains adaptive capability and forces SMEs to divert limited resources towards compliance survival rather than operational renewals or realignment that can build resilience. Thus, the contingency of legal turbulence, when viewed through the lens of strategic resilience, becomes a capability-draining force for SMEs, constraining their ability to build long-term strategic resilience. This outcome confirms DC's role in this study as a moderating mechanism.

5.3 | Technological Environmental Turbulence Effect on SME Strategic Resilience

In this study, we hypothesise that technological environment turbulence has a significant effect on SME strategic resilience. The results confirmed that technological turbulence exerts a significant effect on SME strategic resilience, although its direct effect is weaker than that of legal and economic turbulence. This is an important finding, but rather surprising, as it indicates an optimistic view that digitalisation and innovation are inherently resilience-enhancing mechanisms for SMEs. This view aligns with the findings of Prasanna et al. (2019), Chege and Wang (2020) and Ozturk et al. (2024). While prior studies in this area emphasise the value of technological capacity for driving competitiveness and innovation (Crupi et al. 2020; Vrontis et al. 2022; Valdez-Juárez et al. 2023), this present result suggests that rapid technological changes also raise the adaptive threshold SMEs must meet to remain viable or build resilience. In resource-constrained developing economies, digitalisation and automation may therefore amplify vulnerability through skill gaps, implementation risks and financing limitations. Given this trajectory, this study holds that technological turbulence is best approached as a contingent conditioner that reshapes competitive requirements rather than one that automatically improves strategic resilience.

5.4 | The Moderating Role of Dynamic Capabilities on ET-SME Strategic Resilience

The moderation results provide the study's central theoretical contribution. Our findings demonstrate that dynamic capabilities significantly condition the relationship between ET and SME strategic resilience. Interestingly, we confirm that ETs, as a contingent factor, do not first generate dynamic capability and then transmit their effect through it. Rather, DCs act as preexisting or accumulated adaptive capabilities that shape the extent to which ET affects SMEs' strategic resilience. The results further suggest that the two capability bundles operate differently, but could also be combined to achieve full moderation dynamics. Sensing and seizing capabilities primarily function as short-cycle, responsive mechanisms. This capability enables SMEs to detect shifts in demand, regulation and technology, and to mobilise a response quickly, thereby reducing immediate exposure to environmental disruption. This position aligns with arguments in the literature that sensing enables flexibility in resource mobility (Eisenhardt and Martin 2000; Teece 2007; Martins 2022; Zahoor et al. 2022; Engelmann 2023; Forés et al. 2023). By contrast, learning and reconfiguration capabilities function as deeper adaptive renewal mechanisms. They enable SMEs to revise routines, redeploy resources and restructure operations over time, thereby supporting continuity under sustained turbulence (Belitski and Khalil 2020; Reimann et al. 2021; Haputhanthri et al. 2024). The stronger moderating effect of sensing and seizing suggests that, in highly unstable developing economies, environments such as Nigeria, early recognition and timely action may be especially important for preserving strategic resilience, while learning and reconfiguring contribute more to longer-cycle structural adjustment.

Altogether, these findings align with DC research highlighting the importance of sensing, seizing, learning and reconfiguring under uncertainty (Rodrigues et al. 2021; Kurtz and Varvákis 2016; Kump and Schweiger 2022), but they also refine that literature in two ways. First, they show that DCs should not be treated as universally beneficial resources whose value is constant across contexts. Their contribution is contingent on the type and intensity of ET confronting the firm. Second, they show that resilience emerges not from a generic capability stock but from complementary capability bundles that perform different adaptive functions under turbulence.

In a contingency interpretation, these findings also show that ET does not uniformly produce collapse or continuity. Instead, it creates differentiated pressures depending on whether the SME possesses the adaptive capabilities required to survive. It is therefore concluded that the environment is not a static constraint and that ET and DC jointly shape whether SMEs experience vulnerability, stagnation or adaptive resilience.

6 | Conclusion

This study advances understanding of SME sustainability by operationalising sustainability as strategic resilience under economic, legal and technological turbulence, in a developing-economy context. The findings show that three forms of ET exert significant but differentiated pressures on SMEs, with legal turbulence emerging as the strongest constraint on resilience, followed by economic and technological turbulence. Taken together, this outcome indicates that ET is not a passive background condition, but a central part of the risk environment within which SMEs operate and sustain themselves. The second major finding of this study was that DCs neither eliminate ET nor transmit its effects as moderators. Rather, they moderate the extent to which turbulence affects SME strategic resilience. In this respect, sensing and seizing capabilities appear to support timely responsiveness to environmental disruptions, while learning and reconfiguration capabilities support deeper structural adjustments and continuity under sustained disruption. This study, therefore, positions DCs not as universal buffers but as adaptive mechanisms that condition whether ET leads to vulnerability, stagnation or continuity of resilience.

We caution against interpreting this result as a one-size-fits-all solution, particularly in economic context not classified as a developing or emerging economy. However, the central contribution of this study is that, in institutionally volatile developing economies such as Nigeria, SME sustainability is better understood as the capacity to endure, adapt and reconfigure amid recurrent disruption rather than as equilibrium performance or environmental orientation alone. In this context, firms that fail to sense environmental changes, seize opportunities, learn and understand disruption to reconfigure resources may remain highly vulnerable regardless of policy support or market potential. This study thus establishes environmental turbulence as a critical test condition for SME resilience and positions dynamic capabilities as a central mechanism by which SMEs remain resilient under persistent instability.

7 | Study Implications

7.1 | Managerial and Policy Implications

For SME owners and managers, these findings show that resilience requires active effort and should be treated as an outcome of deliberate adaptive capability building rather than passive endurance. In turbulent environments, SMEs should build or strengthen sensing and seizing capabilities through systematic market intelligence/scanning, regulatory monitoring and timely technology investments to strategically respond to economic, legal and technological changes. The outcome of this strategic move could yield data-driven decisions, flexible resource use and early strategic adjustments. They should also invest in learning and reconfiguration capabilities by improving knowledge acquisition through training and human resource development, encouraging experimentation, redeploying resources and revising routines and business models, so that operations can be adjusted when existing arrangements become ineffective. This study cautions on technology adoption: digitalisation can boost resilience but also raise capability requirements. Approaching technology adoption should not be pursued symbolically, ensuring it aligns with firms' internal skills and adaptive capability if it is to support strategic resilience.

For policymakers, this study indicates that SME vulnerability in developing economies is not merely a firm-level issue, limited to finance or weak formation. Legal turbulence, in particular, regulatory overlaps, inconsistent enforcement and administrative complexity, is a key barrier to SME resilience. This means that policy support should move beyond isolated financial

schemes and include institutional reforms that address these issues. More broadly, SME policy should give greater attention to capability-building support, especially in areas such as regulatory preparedness, market intelligence, digital adoption and organisational learning.

7.2 | Theoretical Implications

This study advances theory in three ways. First, it shows that SME sustainability in a turbulent, developing-economy context is more convincingly interpreted as strategic resilience rather than as equilibrium performance sustainability alone. Second, it extends DCT by empirically showing that capabilities condition the effects of environmental turbulence on SME strategic resilience rather than simply enhancing performance in a general sense. This outcome resolves the inconsistencies in SME sustainability definitions and metrics. Third, by differentiating ET into economic, legal and technological dimensions, the study moves beyond an aggregate view of the external environment and shows that different forms of turbulence exert distinct pressure on SMEs. Together, these contributions support a more contingent understanding of SME resilience under persistent instability.

8 | Limitations and Future Research

This study has limitations that also create opportunities for future research. First, the cross-sectional design limits causal inference and does not capture how SMEs' strategic resilience and dynamic capabilities evolve over time. A longitudinal study could explore whether the moderating effect remains stable amid prolonged turbulence or varies across phases of disruption. Second, although perceptual measures are appropriate for capturing owner–manager assessments of ET and resilience, they may be subject to bias. Future studies could combine perceptual data with objective indicators such as inflation exposure, regulatory change frequency, digital intensity or firm survival outcomes. Third, the study, which focuses solely on registered SMEs in a single Nigerian state, may limit generalisability. Replication in other regions, sectors and developing economies would clarify the external validity of this study's findings. Finally, future work might examine the asymmetric effects of different types of environmental turbulence on resilience and whether additional firm-level contingencies, such as age, size or ownership structure, further condition these relationships.

Author Contributions

All authors have contributed equally to this study.

Acknowledgements

Open access funding provided by the University of Sunderland.

Funding

This research was funded in part by the University of Sunderland's institutional open access agreement.

Conflicts of Interest

The authors declare no conflicts of interest.

References

Abdissa, G., A. Ayalew, A. Dunay, and C. Bálint Illés. 2022. "Determinants of Sustainable Growth of SMEs in Developing Countries: The Case of Ethiopia." *Economies* 10, no. 8: 189. https://doi.org/10.3390/economies10080189.

Adam, N. A., and G. Alarifi. 2021. "Innovation Practices for Survival of Small and Medium Enterprises (SMEs) in the COVID-19 Times: The Role of External Support." *Journal of Innovation and Entrepreneurship* 10, no. 15: 1–22. https://doi.org/10.1186/s13731-021-00156-6.

Adeoye, M. O. 2013. "The Impact of Business Environment on Entrepreneurship Performance in Nigeria." *Computing, Information Systems, Development Informatics and Allied Research* 4, no. 4: 59–64.

Adomako, S., N. Zahoor, S. Tang, I. Chu, and S. X. Zhang. 2025. "CEO Vision Articulation, TMT Relational Attachment, and Corporate Entrepreneurship." *Leadership Quarterly* 36, no. 3: 101881. https://doi.org/10.1016/j.leaqua.2025.101881.

Aguilar, F. J. 2008. "Scanning the Business Environment." In *Routledge eBooks*, 39–62. Routledge. https://doi.org/10.4324/9780080914343-8.

Aladejebi, O., B. S. Peter, and B. Amao-Taiwo. 2024. "The Impact of Business Diagnostics on the Activities of SMEs in Nigeria." *Archives of Business Research* 12, no. 1: 20–34. https://doi.org/10.14738/abr.121.16328.

Al-Hawary, S. I. S., and T. M. Alanazi. 2023. "The Mediating Role of Sustainable Dynamic Capabilities in the Effect of Social Customer Relationship Management on Sustainable Competitive Advantage: A Study on SMEs in Saudi Arabia." *Sustainability* 15, no. 3: 1952. https://doi.org/10.3390/su15031952.

Alraja, M. N., R. Imran, B. M. Khashab, and M. Shah. 2022. "Technological Innovation, Sustainable Green Practices and SMEs Sustainable Performance in Times of Crisis (COVID-19 Pandemic)." *Information Systems Frontiers* 24, no. 4: 1081–1105. https://doi.org/10.1007/s10796-022-10250-z.

Alshanty, A. M., and O. L. Emeagwali. 2019. "Market-Sensing Capability, Knowledge Creation and Innovation: The Moderating Role of Entrepreneurial Orientation." *Journal of Innovation and Knowledge* 4, no. 3: 171–178. https://doi.org/10.1016/j.jik.2019.02.002.

AlZayani, F., A. Mohammed, and H. M. Shoaib. 2023. "The Impact of Smart Technologies on Smes' Sustainability: The Mediation Effect of Sustainability Strategy." *Competitiveness Review* 34, no. 1: 28–50. https://doi.org/10.1108/cr-09-2022-0136.

Amoako, S., and E. Boateng. 2022. "Considering Factors That Leads to Sustainability of Small and Medium Enterprises in Ghana Using PESTEL and Theories of Entrepreneurship as a Measuring Tool." *Technium Social Sciences Journal* 31: 594–653. https://doi.org/10.47577/tssj.v31i1.6340.

Asumah, S., C. Antwi-Boateng, and F. Benneh. 2024. "Eco-Dynamic Capability: A Surest Way to Sustainability Performance of SMEs?" *IIMBG Journal of Sustainable Business and Innovation* 2, no. 1: 24–42. https://doi.org/10.1108/ijsbi-08-2023-0043.

Ayang, E. 2022. "Influence of Environmental Factors on SMEs Survival and Sustainability in Cross River State, (Unpublished M. Sc Thesis)." Department of Business Management, University of Calabar, Nigeria.

Bakos, J., M. Siu, A. Orengo, and N. Kasiri. 2020. "An Analysis of Environmental Sustainability in Small & Medium-Sized Enterprises: Patterns and Trends." *Business Strategy and the Environment* 29, no. 3: 1285–1296. https://doi.org/10.1002/bse.2433.

Bassey, O. E. 2023. "Environmental Factors and Performance of Selected Small and Medium Enterprises in Akwa Ibom and Cross River States:

An Examination of the Dynamic Capabilities Effect, (Unpublished Doctoral Dissertation).” Department of Business Management, University of Calabar, Nigeria.

Belgibayeva, A., O. Denissova, M. Kozlova, I. Savchenko, A. Tleubayev, and G. Siximbayeva. 2022. “Analysis of Sustainable Development of SMEs in Agriculture.” *Journal of Environmental Management and Tourism* 13, no. 3: 681. https://doi.org/10.14505/jemt.v13.3(59).09.

Belitski, M., and S. Khalil. 2020. “Dynamic Capabilities for Firm Performance Under the Information Technology Governance Framework.” *European Business Review* 32, no. 2: 129–157. https://doi.org/10.1108/EBR-05-2018-0102.

Blundel, R., A. Monaghan, and C. Thomas. 2013. “SMEs and Environmental Responsibility: A Policy Perspective.” *Business Ethics a European Review* 22, no. 3: 246–262. https://doi.org/10.1111/beer.12020.

Bosio, Erica, S. Djankov, F. Jolevski, and R. Ramalho. 2020. “Survival of Firms During Economic Crisis. Policy Research Working Paper; No. 9239.” World Bank. License: CC BY 3.0 IGO. http://hdl.handle.net/10986/33751.

Budianto, R., A. Praptapa, E. Herwiyanti, P. Puji, E. Suyono, and O. Rusmana. 2023. “Technological Innovation in Small and Medium Enterprises: A Bibliometric Analysis.” *Journal of Sustainable Tourism and Entrepreneurship* 3, no. 4: 271–285. https://doi.org/10.35912/joste.v3i4.1707.

Chege, S. M., and D. Wang. 2020. “The Influence of Technology Innovation on SME Performance Through Environmental Sustainability Practices in Kenya.” *Technology in Society* 60: 101210. https://doi.org/10.1016/j.techsoc.2019.101210.

Chen, C. J., C. C. Chang, and S. W. Hung. 2011. “Influences of Technological Attributes and Environmental Factors on Technology Commercialization.” *Journal of Business Ethics* 104: 525–535. https://doi.org/10.1007/s10551-011-0926-6.

Cheraghalizadeh, R., H. Olya, and M. Tumer. 2021. “The Effects of External and Internal Factors on Competitive Advantage—Moderation of Market Dynamism and Mediation of Customer Relationship Building.” *Sustainability* 13, no. 7: 4066. https://doi.org/10.3390/su13074066.

Crupi, A., N. Del Sarto, A. Di Minin, et al. 2020. “The Digital Transformation of SMEs – A New Knowledge Broker Called the Digital Innovation Hub.” *Journal of Knowledge Management* 24, no. 6: 1263–1288. https://doi.org/10.1108/jkm-11-2019-0623.

Dayioglu, M., F. Küskü, and D. Çetindamar. 2024. “The Impact of Business Environmental Factors on Performance Through Strategic Agility and Business Model Innovation: An Analysis Based on Dynamic Capabilities Theory.” *IEEE Transactions on Engineering Management* 71: 3656–3670. https://doi.org/10.1109/tem.2024.3353734.

Dipeolu, O., S. Adeoye, and I. Ogundinwin. 2024. “Government Roles and Environmental Sustainability of Selected SMEs in Ogun State, Nigeria.” *International Journal of Comparative Studies in International Relations and Development* 10, no. 1: 67–83. https://doi.org/10.48028/iiprds/ijcsird.v10.i1.06.

Duchek, S. 2020. “Organizational Resilience: A Capability-Based Conceptualization.” *Business Research (Göttingen)* 13, no. 1: 215–246. https://doi.org/10.1007/s40685-019-0085-7.

Ebabu, E. A. 2012. “The Effect of External Factors on Industry Performance: The Case of Lalibela City Micro and Small Enterprises, Ethiopia.” *Journal of Innovation and Entrepreneurship* 10, no. 10: 1–14. https://doi.org/10.1186/s13731-021-00147-7.

Eikelenboom, M., and G. De Jong. 2019. “The Impact of Dynamic Capabilities on the Sustainability Performance of SMEs.” *Journal of Cleaner Production* 235: 1360–1370. https://doi.org/10.1016/j.jclepro.2019.07.013.

Eisenhardt, K. M., and J. A. Martin. 2000. “Dynamic Capabilities: What Are They?” *Strategic Management Journal* 21, no. 10–11: 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11.

Engelmann, A. 2023. “A Performative Perspective on Sensing, Seizing, and Transforming in Small- and Medium-Sized Enterprises.” *Entrepreneurship and Regional Development* 36, no. 5–6: 632–658. https://doi.org/10.1080/08985626.2023.2262430.

Forés, B., A. Puig-Denia, J. M. Fernández-Yáñez, and J. M. Fernández-Yáñez. 2023. “Dynamic Capabilities and Environmental Performance: All in the Family.” *Management Decision* 61, no. 13: 248–271. https://doi.org/10.1108/md-10-2022-1344.

Galbraith, J. R. 2002. *Designing Organizations: An Executive Guide to Strategy, Structure, and Progress*. Vol. 197. Pfeiffer & co.

Galbraith, J. R. 2014. *Designing Organizations: Strategy, Structure, and Process at the Business Unit and Enterprise Levels*. Third ed. Jossey-Bass.

Ghag, N., P. Acharya, and V. Khanapuri. 2023. “Analyzing the Sustainable International Competitiveness Factors of SMEs by Fuzzy Delphi and Neutrosophic DEMATEL.” *Business Strategy and Development* 6, no. 3: 447–463. https://doi.org/10.1002/bsd2.250.

Gini, K. B., and H. O. Agala. 2023. “The Impact of Macro-Environmental Factors on Business Performance.” *International Journal of Research and Innovation in Social Science* VII, no. XI: 1837–1843. https://doi.org/10.47772/ijriss.2023.7011145.

Guenther, P., M. Guenther, C. M. Ringle, G. Zaefarian, and S. Cartwright. 2023. “Improving PLS-SEM Use for Business Marketing Research.” *Industrial Marketing Management* 111: 127–142. https://doi.org/10.1016/j.indmarman.2023.03.010.

Gumel, B. I., and B. B. Bardai. 2021. “The Mediating Impact of SMEDAN Initiative on the Relationship Between CSFs and Smes' Success: A Conceptual Paper.” *International Journal of Business and Economics Research* 10, no. 2: 66–75. https://doi.org/10.11648/j.ijber.20211002.12.

Gutiérrez-Rodríguez, A. J., N. J. Barón, and J. M. G. Martínez. 2020. “Validity of Dynamic Capabilities in the Operation Based on New Sustainability Narratives on Nature Tourism SMEs and Clusters.” *Sustainability* 12, no. 3: 1004. https://doi.org/10.3390/su12031004.

Hadi, P. 2023. “Improving Firm Sustainability Through Dynamic Capability: The Mediation Role of Ambidexterity.” *International Journal of Professional Business Review* 8, no. 5: e01511. https://doi.org/10.26668/businessreview/2023.v8i5.1511.

Hair, J. F., J. J. Risher, M. Sarstedt, and C. M. Ringle. 2019. “When to Use and How to Report the Results of PLS-SEM.” *European Business Review* 31, no. 1: 2–24.

Haputhanthri, H., U. Jayawickrama, L. Lakma, E. Sellahewa, K. Wisenthige, and T. Jayathilake. 2024. “Impact of Dynamic Capabilities on Business Performance of SMEs During an Economic Crisis With Reference to Western Province.” *SLIIT Business Review* 3, no. 2: 55–74. https://doi.org/10.54389/toei6623.

Hawach, F., and I. Requejo. 2025. “Financial Distress Likelihood of European SMEs in Times of Economic Policy Uncertainty: The Role of Family Ownership and Performance Aspirations.” *International Review of Financial Analysis* 105: 104418. https://doi.org/10.1016/j.irfa.2025.104418.

Hawass, H. H. 2010. “Exploring the Determinants of the Reconfiguration Capability: A Dynamic Capability Perspective.” *European Journal of Innovation Management* 13, no. 4: 409–438. https://doi.org/10.1108/14601061011086276.

Helhel, Y., and S. Helhel. 2026. “An Assessment of Economic and Geopolitical Risk Sensitivity in the Tourism Sector: Evidence From Firm-Level Performance and Stock Returns (2012–2025).” *Journal of Risk and Financial Management* 19, no. 2: 102. https://doi.org/10.3390/jrfm19020102.

Henseler, J., C. M. Ringle, and M. Sarstedt. 2014. "A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling." *Journal of the Academy of Marketing Science* 43, no. 1: 115–135. https://doi.org/10.1007/s11747-014-0403-8.

Hernita, H., B. Surya, I. Perwira, H. Abubakar, and M. Idris. 2021. "Economic Business Sustainability and Strengthening Human Resource Capacity Based on Increasing the Productivity of Small and Medium Enterprises (SMEs) in Makassar City, Indonesia." *Sustainability* 13, no. 6: 3177. https://doi.org/10.3390/su13063177.

Ifekwem, N., and O. Adedamola. 2016. "Survival Strategies and Sustainability of Small and Medium Enterprises in the Oshodi-Isolo Local Government Area of Lagos State." *Acta Universitatis Sapientiae, Economics and Business* 4: 103–118.

Kareem, M. A., and A. A. Alameer. 2019. "The Impact of Dynamic Capabilities on Organizational Effectiveness." *Management and Marketing Challenges for the Knowledge Society* 14, no. 4: 402–418. https://doi.org/10.2478/mmcks-2019-0028.

Kayode, K. B., and A. O. Ilesanmi. 2014. "Determinants of Factors Influencing Capacity of Small and Medium Enterprises (SMEs) in Employment Creation in Lagos State, Nigeria." *International Journal of Financial Research* 5, no. 2: 133–141.

Kebede, M., and G. Simesh. 2015. "The Impact of Environmental Factors on the Performance of Micro and Small-Scale Enterprises in East Gojjam Zone, Ethiopia." *International Journal of Science and Research* 6: 1619–1628.

Krejcie, R. V., and D. W. Morgan. 1970. "Determining Sample Size for Research Activities." *Educational and Psychological Measurement* 30, no. 3: 607–610.

Kump, B., and C. Schweiger. 2022. "Mere Adaptability or Dynamic Capabilities: A Qualitative Multi-Case Study on How SMEs Renew Their Resource Bases." *International Journal of Entrepreneurial Venturing* 14, no. 3: 1–40. https://doi.org/10.1504/ijev.2022.124967.

Kurtz, D. J., and G. Varvákis. 2016. "Dynamic Capabilities and Organizational Resilience in Turbulent Environments." In *Springer eBooks*, 19–37. Springer International Publishing. https://doi.org/10.1007/978-3-319-27303-7_2.

Majid, A., M. Yasir, M. Yasir, and A. Javed. 2019. "Nexus of Institutional Pressures, Environmentally Friendly Business Strategies, and Environmental Performance." *Corporate Social Responsibility and Environmental Management* 27, no. 2: 706–716. https://doi.org/10.1002/csr.1837.

Malesios, C., D. De, A. Moursellas, P. K. Dey, and K. Evangelinos. 2021. "Sustainability Performance Analysis of Small and Medium Sized Enterprises: Criteria, Methods and Framework." *Socio-Economic Planning Sciences* 75: 100993. https://doi.org/10.1016/j.seps.2020.100993.

Mallett, O., R. Wapshott, and T. Vorley. 2018. "How Do Regulations Affect SMEs? A Review of the Qualitative Evidence and a Research Agenda." *International Journal of Management Reviews* 21, no. 3: 294–316. https://doi.org/10.1111/ijmr.12191.

Martins, A. 2022. "Dynamic Capabilities and SME Performance in the COVID-19 Era: The Moderating Effect of Digitalization." *Asia-Pacific Journal of Business Administration* 15, no. 2: 188–202. https://doi.org/10.1108/APJBA-08-2021-0370.

Müller, J. M., O. Buliga, and K. Voigt. 2021. "The Role of Absorptive Capacity and Innovation Strategy in the Design of Industry 4.0 Business Models - A Comparison Between SMEs and Large Enterprises." *European Management Journal* 39, no. 3: 333–343. https://doi.org/10.1016/j.emj.2020.01.002.

Nambisan, S., M. Wright, and M. Feldman. 2019. "The Digital Transformation of Innovation and Entrepreneurship: Progress, Challenges and Key Themes." *Research Policy* 48, no. 8: 103773. https://doi.org/10.1016/j.respol.2019.03.018.

Nyarku, K. M., and S. Oduro. 2017. "Effect of Legal and Regulatory Framework on SMEs Growth in the Accra Metropolis of Ghana." *International Journal of Entrepreneurship and Innovation* 19, no. 3: 207–217. https://doi.org/10.1177/1465750317742842.

Ogunmuyiwa, M. S., and A. E. Adetayo. 2023. "Environmental Factors and SMEs' Performance in Ogun State, Nigeria." *Modern Management Review* 28, no. 2: 51–58. https://doi.org/10.7862/rz.2023.mmr.11.

Oluremi, D. O., and O. A. Maku. 2024. "Small and Medium Scale Enterprises and Nigeria Economic Growth." *International Journal of Small Business and Entrepreneurship Research* 12, no. 5: 71–89. https://doi.org/10.37745/ijsber.2013/vol12n57189.

Opoku, R. K. 2025. "Resilience Capabilities and Performance Dimensions of Manufacturing Supply Chains in a Developing Economy." *Business Process Management Journal* 31, no. 7: 2929–2955. https://doi.org/10.1108/BPMJ-07-2024-0577.

Ozturk, I., O. Alqassimi, and S. Ullah. 2024. "Digitalization and SMEs Development in the Context of Sustainable Development: A China Perspective." *Heliyon* 10: e27936. https://doi.org/10.1016/j.heliyon.2024.e27936.

Peprah, A. A., B. A. Atarah, and M. K. Kumodzie-Dussey. 2024. "Nonmarket Strategy and Legitimacy in Institutionally Voided Environments: The Case of Jumia, an African e-Commerce Giant." *International Business Review* 33, no. 2: 102169. https://doi.org/10.1016/j.ibusrev.2023.102169.

Permatasari, P., and J. Gunawan. 2023. "Sustainability Policies for Small Medium Enterprises: WHO Are the Actors?" *Cleaner and Responsible Consumption* 9: 100122. https://doi.org/10.1016/j.clrc.2023.100122.

Pertheban, T. R., T. Ramayah, A. Marimuthu, et al. 2023. "The Impact of Proactive Resilience Strategies on Organizational Performance: Role of Ambidextrous and Dynamic Capabilities of SMEs in Manufacturing Sector." *Sustainability* 15, no. 16: 1–32. https://doi.org/10.3390/su151612665.

Pervan, M., M. Curak, and T. Kramaric. 2018. "The Influence of Industry Characteristics and Dynamic Capabilities on Firms' Profitability." *International Journal of Financial Studies* 6, no. 1: 1–19. https://doi.org/10.3390/ijfs6010004.

Prajogo, D. I. 2016. "The Strategic Fit Between Innovation Strategies and Business Environment in Delivering Business Performance." *International Journal of Production Economics* 171: 241–249. https://doi.org/10.1016/j.ijpe.2015.07.037.

Prasanna, R., J. Jayasundara, S. K. N. Gamage, E. Ekanayake, P. Rajapakshe, and G. Abeyrathne. 2019. "Sustainability of SMEs in the Competition: A Systemic Review on Technological Challenges and SME Performance." *Journal of Open Innovation* 5, no. 4: 1–18. https://doi.org/10.3390/joitmc5040100.

PwC Nigeria. 2024. "PwC's MSME Survey 2024: Building Resilience – Strategies for MSME Success in a Changing Landscape." https://www.pwc.com/ng/en/assets/pdf/pwc-msme-survey-report-2024.pdf.

Pyper, K., A. Marie Doherty, S. Gounaris, and A. Wilson. 2022. "A Contingency-Based Approach to the nexus Between International Strategic Brand Management and Export Performance." *Journal of Business Research* 148: 472–488. https://doi.org/10.1016/j.jbusres.2022.04.003.

Radičić, D., and S. Petković. 2023. "Impact of Digitalization on Technological Innovations in Small and Medium-Sized Enterprises (SMEs)." *Technological Forecasting and Social Change* 191: 122474. https://doi.org/10.1016/j.techfore.2023.122474.

Reed, J. H. 2021. "Strategic Agility in the SME: Use It Before You Lose It." *Journal of Small Business Strategy* 31, no. 3: 33–46. https://doi.org/10.53703/001c.29734.

Rehman, K., and Z. Saeed. 2015. "Impact of Dynamic Capabilities on Firm Performance: Moderating Role of Organizational Competencies."

Sukkur IBA Journal of Management and Business 2, no. 2: 18–40. https://doi.org/10.30537/sijmb.v2i2.92.

Reimann, C., F. Carvalho, and M. P. Duarte. 2021. "The Influence of Dynamic and Adaptive Marketing Capabilities on the Performance of Portuguese SMEs in the B2B International Market." *Sustainability* 13, no. 2: 1–23. https://doi.org/10.3390/su13020579.

Rodrigues, M., M. Franco, M. Da Silva Hounsell, and C. Oliveira. 2021. "Success Factors of SMEs: Empirical Study Guided by Dynamic Capabilities and Resources-Based View." *Sustainability* 13, no. 21: 1–17. https://doi.org/10.3390/su132112301.

Sagala, G. H., and D. Őri. 2025. "Exploring Digital Transformation Strategy to Achieve SMEs Resilience and Antifragility: A Systematic Literature Review." *Journal of Small Business & Entrepreneurship* 37, no. 3: 495–524. https://doi.org/10.1080/08276331.2024.2392080.

Schilke, O. 2014. "On the Contingent Value of Dynamic Capabilities for Competitive Advantage: The Nonlinear Moderating Effect of Environmental Dynamism." *Strategic Management Journal* 35, no. 2: 179–203. https://doi.org/10.1002/smj.2099.

Senin, S. M., N. H. Juhdi, A. R. C. Omar, and N. A. Hashim. 2024. "Small and Medium Enterprises Survival During the Global Crises: A Systematic Review of Theoretical Perspectives of Building Resilience in the Time of Crisis." *Cogent Business & Management* 11, no. 1: 1–19. https://doi.org/10.1080/23311975.2024.2395428.

Shahzad, F., and A. Arslan. 2023. "Sustainability Transition Dynamics of SMEs in a Volatile Emerging Economy: A Qualitative Exploration." In *Strategic Management and Sustainability Transitions*, 152–171. Routledge.

Sharfaei, S., J. W. Ong, and A. O. Ojo. 2023. "The Effects of Dynamic Capabilities on International Smes' Performance." *International Journal of Globalisation and Small Business* 13, no. 3: 247–267. https://doi.org/10.1504/ijgsb.2023.130321.

Sigcha, E., A. Martinez-Moscoso, L. Siguenza-Guzman, and D. Jadan. 2021. "PESTEL Analysis as a Baseline to Support Decision-Making in the Local Textile Industry." In *Systems and Information Sciences. ICCIS 2020. Advances in Intelligent Systems and Computing*, edited by M. Botto-Tobar, W. Zamora, J. Larrea Plúa, J. Bazurto Roldan, and A. Santamaría Philco, vol. 1273. Springer International Publishing. https://doi.org/10.1007/978-3-030-59194-6_13.

Sinha, A. K., A. K. Mishra, R. L. Manogna, and R. Prabhudesai. 2023. "Determinants of Sustainable Financial and Innovation Performance: A Panel Data Analysis of Indian Manufacturing SMEs." *International Journal of Business and Globalisation* 33, no. 1/2: 113–129. https://doi.org/10.1504/ijbg.2023.128325.

Siyanbola, T. O. 2020. "Environmental Factors and Sustainability of Small and Medium Businesses in Lagos Metropolitan Area, Lagos State, Nigeria." *International Journal of Business and Management* 8, no. 2: 226–278. https://doi.org/10.24940/theijbm/2020/v8/i2/bm2002-088.

SMEDAN. 2015. "Registered SMEs in Akwa Ibom State." Access 10th December, 2025. Available at: https://smedan.gov.ng.

Suryana, H. 2016. "The Influence of External Environmental Forces and Strategic Orientation on Value Creation and the Implication on Business Performance." In *Proceedings of the 2016 Global Conference on Business, Management and Entrepreneurship*. Atlantis Press. https://doi.org/10.2991/gcbme-16.2016.182.

Taghizadeh, S. K., S. A. Rahman, D. Nikbin, M. Radomska, and S. M. Far. 2023. "Dynamic Capabilities of the SMEs for Sustainable Innovation Performance: Role of Environmental Turbulence." *Journal of Organizational Effectiveness: People and Performance* ahead-of-print, no. ahead-of-print: 767–787. https://doi.org/10.1108/JOEPP-04-2023-0166.

Taiwo, M., A. M. Ayodeji, and B. A. Yusuf. 2013. "Impact of Small and Medium Enterprises on Economic Growth and Development." *American Journal of Business and Management* 2, no. 1: 18–22. https://doi.org/10.11634/21679606170644.

Teece, D. J. 2007. "Explicating Dynamic Capabilities: The Nature and Micro-Foundations of (Sustainable) Enterprise Performance." *Strategic Management Journal* 28, no. 13: 1319–1350. https://doi.org/10.1002/smj.640.

Teece, D. J. 2018. "Dynamic Capabilities as (Workable) Management Systems Theory." *Journal of Management & Organization* 24, no. 3: 359–368. https://doi.org/10.1017/jmo.2017.75.

Teece, D. J., M. A. Peteraf, and S. Leih. 2016. "Dynamic Capabilities and Organizational Agility: Risk, Uncertainty, and Strategy in the Innovation Economy." *California Management Review* 58, no. 4: 13–35. https://doi.org/10.1525/cmr.2016.58.4.13.

Teece, D. J., G. P. Pisano, and A. Shuen. 1997. "Dynamic Capabilities and Strategic Management." *Strategic Management Journal* 18, no. 7: 509–533. https://doi.org/10.1002/(sici)1097-0266(199708)18:7.

Tolstoy, D., E. R. Nordman, and U. Vu. 2022. "The Indirect Effect of Online Marketing Capabilities on the International Performance of e-Commerce SMEs." *International Business Review* 31, no. 3: 1–10. https://doi.org/10.1016/j.ibusrev.2021.101946.

Turulja, L., and N. Bajgoric. 2019. "Innovation, Firms' Performance and Environmental Turbulence: Is There a Moderator or Mediator?" *European Journal of Innovation Management* 22, no. 1: 213–232. Available at:. https://doi.org/10.1108/EJIM-03-2018-0064.

Tyler, B. B., B. Lahneman, D. Cerrato, et al. 2023. "Environmental Practice Adoption in SMEs: The Effects of Firm Proactive Orientation and Regulatory Pressure." *Journal of Small Business Management* 62, no. 5: 2211–2246. https://doi.org/10.1080/00472778.2023.2218435.

Ufua, D. E., O. J. Olujobi, M. E. Ogbari, J. A. Dada, and O. D. Edafe. 2020. "Operations of Small and Medium Enterprises and the Legal System in Nigeria." *Humanities and Social Sciences Communications* 7, no. 1: 1–8. https://doi.org/10.1057/s41599-020-00583-y.

Valdez-Juárez, L. E., E. A. Ramos-Escobar, and E. P. B. Álvarez. 2023. "Reconfiguration of Technological and Innovation Capabilities in Mexican SMEs: Effective Strategies for Corporate Performance in Emerging Economies." *Administrative Sciences* 13, no. 15: 1–25. https://doi.org/10.3390/admsci13010015.

Verdu-Jover, A. J., E. Verwaal, J. M. De Haro Garcia, and J. Lopes-La-Falce. 2026. "Strategic Flexibility in Turbulent Business Environments." *Management Decision* 1–22: 1–22. https://doi.org/10.1108/MD-03-2025-0688.

Volberda, H. W., N. van der Weerdt, E. Verwaal, M. Stienstra, and A. J. Verdu. 2012. "Contingency Fit, Institutional Fit, and Firm Performance: A Metafit Approach to Organization–Environment Relationships." *Organization Science* 23, no. 4: 1040–1054. https://doi.org/10.1287/orsc.1110.0687.

Vrontis, D., R. Chaudhuri, and S. Chatterjee. 2022. "Adoption of Digital Technologies by SMEs for Sustainability and Value Creation: Moderating Role of Entrepreneurial Orientation." *Sustainability* 14, no. 13: 7949. https://doi.org/10.3390/su14137949.

World Economic Forum. 2022. "Future Readiness of SMEs and Mid-Sized Companies: A Year On." https://www.weforum.org/publications/future-readiness-.

Zahoor, N., İ. Gölgeci, L. Haapanen, I. Ali, and A. Arslan. 2022. "The Role of Dynamic Capabilities and Strategic Agility of B2B High-Tech Small and Medium-Sized Enterprises During COVID-19 Pandemic: Exploratory Case Studies From Finland." *Industrial Marketing Management* 105: 502–514. https://doi.org/10.1016/j.indmarman.2022.07.006.