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Leveraging Innovation Capability and Organizational Resilience for Business Sustainability Among Small and Medium Enterprises: A PLS-SEM Approach

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Abstract: The purpose of this study is to investigate the effect of innovation capability on business sustainability in Nigerian small and medium-sized enterprises (SMEs), as well as consider the effects of organizational resilience, sustainable competitive advantage, and environmental dynamism as mediators in succession. A quantitative approach was adopted to collect data from 401 employees in SMEs in the Lagos Metropolitan Area of Nigeria. We conducted the analysis of the collected data using the partial least squares approach (PLS-SEM). This research establishes that innovation capabilities are beneficial for ensuring business sustainability. The findings further corroborate the importance of sustainable competitive advantage and environmental dynamism for business sustainability. Finally, the results show that environmental dynamism is important for helping small business owners sustain their businesses and increase their innovation capabilities. Similarly, the indirect paths also showed that resilience organizations, like SMEs, play a role in the paradigm. However, businesses can benefit from this study's findings by crafting strategies that adapt more quickly to changing market dynamics and capitalize on emerging possibilities. This way, businesses may take the necessary measures to stay ahead of the competition while guaranteeing sustainability. Even though the heuristic model emphasizes originality, the current research on how to successfully link innovative capacity to sustainability and build sustainability in dynamic environments is sparse.

Keywords: business sustainability; environmental dynamism; innovation capability; organizational resilience; PLS-SEM; sustainable competitive advantage; SMEs



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1. Introduction

In the contemporary corporate environs, the management paradigm that prioritizes profit and productivity maximization is entirely antiquated. Even as innovation and capitalizing on changes in the environment are critical to firms' sustainability and competition, enterprises existing in today's uncertain business climate need to be creative, resilient, and well-informed to thrive.

Recently, there has been a growing trend of businesses reconsidering social responsibility and acknowledgement that financial gain is not necessarily the most critical indicator of sustainability. The integration of sustainable development goals (SDG) into the footing of business decision making has thus been the subject of much recent research on sustainable business models. The purpose of the present study is to add to the existent literature, outlining a theory and practice-based framework that can help organizations move toward creating a more sustainable development paradigm. This framework will highlight the key elements that businesses need to align their competitive performance with sustainability goals.

In addition to focusing on economic goals, governments are increasingly concerned with environmental protection and meeting social needs. Thus, many companies have placed a premium on enhancing their capacity for innovation to fortify their positions in the market and ensure their long-term viability [1,2]. The capacity of a company to meet consumer demands through the introduction of innovative or enhanced goods, services, processes, and marketing strategies is defined as innovation in the literature [3–5]. Hanaysha and Hilman [6] state that companies are confronted with significant problems on sustainability policies, and that innovation is the key to overcoming these problems, even as it helps businesses maintain and even increase their long-term performance.

According to Fernández et al. [7], environmentally conscious businesses prioritize processes and goods that reduce resource use and increase energy efficiency. In addition, they discovered that companies that prioritize innovation to reduce their environmental impact often aim to improve energy efficiency through their innovations. Despite the widespread belief that an organization's capacity to innovate is a critical factor in its success or failure, few studies have really examined the correlation between innovation and the long-term viability of businesses, especially in the context of small and medium-sized enterprises (SMEs). Few empirical studies on innovation capacities show a limited focus on product, process, or service development as the only areas where companies can expand their innovation capabilities [8,9] as it relates to sustainability [10,11]. Therefore, this study adds to the existing body of knowledge by considering the influence of innovation capability on the sustainability and viability of SMEs.

Furthermore, companies in today's fast-paced business world face a multitude of obstacles that require constant adaptation if they want to be competitive and survive. To adapt in a sustainable way, organizations have been looking to the environment more and more in the last two decades [12,13]. The existing literature has made some progress, but it still lacks answers to important questions about how to best foster ecosystems for innovation and resilience. Further exploration and vital factors, such as environmental dynamism, resilience, sustainable competitive advantage, and innovation (creation, improvement, expansion, contraction, or change), are required to ensure sustainability in business operations, particularly among SMEs, in a developing nation like Nigeria.

To address the identified research gap and reveal the study's rationale, we formulated the following concise research parameters: The main objective of this study is to examine the relationship between innovation capability and the sustainability of small and medium-sized firms (SMEs) in Nigeria. Secondly, this study attempts to understand the impact of innovation capabilities on sustained competitive advantages. Thirdly, this study aims to address how these enterprises leverage sustainable competitive advantages to secure their own sustainability. Fourthly, this study aims to determine the extent to which environmental dynamism mediates the relationship between innovation capability and corporate sustainability. Finally, it serves as an intermediary between innovation capacity and business sustainability in Nigerian SMEs, assessing the influence of organizational resilience on this association.

The purpose of these study parameters is to analyze the roles of organizational resilience, innovative capability, and environmental dynamism in business sustainability among SMEs in Nigeria. This study explicitly links these parameters to the identified research gap to establish realistic expectations for the reader regarding the scope and relevance of this research. This study seeks to offer novel insights into the correlation between innovation capabilities and sustainability outcomes by leveraging dual theories: contingency and capital-based theories. The technique employed is quantitative and depends on the data gathered by the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), the regulating body for Nigerian SMEs. We expect that the results will advance sustainable business practices by guiding policy and strategic decision-making activities for SMEs in Nigeria and similar economies.

This paper is structured as follows: Sections 1 and 2 defines core hypotheses and highlights research gaps. Subsequently, it analyzes the relationships among innovation

capability, sustainable competitive advantage, environmental dynamics, organizational resilience, and business sustainability in Nigerian SMEs. Section 3 delineates the technique and data acquisition for the quantitative investigation. Section 4 analyzes organizational resilience and environmental dynamics, including their functions and interconnections. Section 5 presents the discourse on pertinent previous research. Section 6 examines the relationship between the findings and their theoretical and practical consequences, along with the limitations of the evidence and suggestions for future research.

2. Review of Relevant Literature

2.1. Theoretical Framework

2.1.1. Contingency Theory

The core tenet of contingency theory is that an organization's internal strategies and resources must be compatible with external factors that the organization cannot control. A multitude of factors, including its internal processes, external environment, and structure, determine a corporation's success, according to the contingency method. In response to challenges like these, companies often take on new stances that better suit the communities in which they do business. Adopting the tenets of contingency theory means realizing that a company cannot control its external environment; thus, it must pay great attention to competitors' products, customer demands, and market conditions if it wants to be successful. Organizational success and improved performance are outcomes of paying attention to the outside world and adjusting plans appropriately [14,15].

Considering the importance of comprehending the effects of an organization's exposure to an uncertain external environment on its structure, strategy, and context, this study employs contingency theory grounded in the research of Rauch et al. [14] and Yeoh and Jeong [15]. In the context of small and medium-sized enterprises (SMEs), the alignment between the organizational structure of decision making and external pressure determines the implementation of environmental management, whereby the application of the contingency theory to sustainability may influence several factors, like innovation and resilience, in the implementation and configuration of sustainability-oriented practices.

2.1.2. Capability-Based Theory

Several studies in the field of strategy have presented SCA's capability-based theory as a means by which a company can gain an advantage over its rivals. These studies include [16,17], who adapt more quickly to changing market dynamics and capitalize on emerging possibilities. The term "capabilities" emphasizes the role of strategic management in capability-based theory (CBT) in reshaping an organization's resources, competencies, and functional competences to match the needs of a dynamic and unpredictable environment. Teece et al. [18] assert that a company's competitive advantage stems from its unique and hard-to-replicate resources, which originate "upstream" from product markets. Companies require the capacity to "integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" [18]. When it comes to sustainability, the current industrial mindset is deficient in identifying potential problems and solutions. Despite a substantial deal of literature on sustainable business model theory development, our knowledge of how to combine sustainability with competitive advantage strategies is lacking [19–21].

In recent years, strategy research has seen a rise in the CBT of sustainable competitive advantage, which proposes that a company can gain an advantage in the market by capitalizing on its unique strengths. By providing important decision makers a proactive and dominating role, the CBT elucidates the value generation process. The capability-based theory provides a compelling rationalization of value creation by placing the firm's most important decision makers in leadership and initiative positions.

2.2. Conceptual Review and Hypothesis Development

2.2.1. Innovation Capabilities

Innovative capabilities, which in turn foster innovation, are responsible for companies' exceptional performance and ability to remain competitive in their respective industries [22,23]. For companies to adapt and stay afloat in ever-changing marketplaces, they continuously look for ways to enhance their innovation capabilities when they are up against intense competition [24,25]. Innovation capacity defines an organization's ability to consistently transform domain and application specific knowledge into novel outcomes [26].

Organizational innovation capability consists of its internal capacity to consistently generate new ideas and increase firm and stakeholder values [27]. A firm's capacity to innovate can also be defined in terms of the factors that influence their innovation management [28]. According to Ballor and Claar [29], entrepreneurs place an emphasis on pushing people in the organization to develop the current knowledge system through innovation and the propagation of those innovation traits. All businesses can achieve higher levels of innovation when they use all four skills, and the actual strength of this classification led us to adopt it [30]. Empirical studies from a variety of economic and industrial backgrounds have previously examined and validated it [22,31,32]. According to Zawislak et al. [33], a firm's ability to innovate relies on the people, systems, and processes it employs to transform existing bodies of knowledge into marketable products and services. In a turbulent environment, a corporation must be innovative. Innovative performance requires innovative capabilities.

2.2.2. Environmental Dynamism

Environmental dynamism denotes the inherent unpredictability of the frequency at which changes occur in the external environment [34]. Organizations are promptly managing environmental instability and other risks while also seeking new commercial prospects in reaction to the more unpredictable climate changes [10,35]. According to Hou et al. [36] and Schilke [37], a dynamic environment involves uncontrollable factors that impact the firm. In times of uncertainty, companies must be extremely nimble with their funds, individuals, and opinions, and they must be dead set on making decisions. The dynamic environment remains unstable and unpredictable with the market's product offerings, technological changes, and client demand. Extremely dynamic and unpredictable environments accruable to situations, such as abrupt demand changes, short-lived competitive advantages, and low-slung barriers to entry and exit, foster a climate of uncertainty and unpredictability [38]. In most emerging nations, SMEs have had to be creative with their financial problems due to economic unpredictability and severe industry competition.

2.2.3. Sustainable Competitive Advantage

Going by international competitiveness, two distinct forms of competitive advantage exist. The first is the transitory competitive advantage, which has a large profit margin but does not last forever. The second type of competitive advantage is one that can last as long as the source of the advantage remains unchanged [39].

Organizations, even in the face of agile situations and rapid changes in technology life cycles, can benefit from a sustainable competitive advantage to maintain smooth business operations. Consequently, it helps organizations reap benefits in the long run while warding off strategic competitors [40]. In conclusion, firms realize continuous competitive advantage by focusing on their strengths rather than trying to emulate their competitors' strategies [41,42].

2.2.4. Organizational Resilience

A resilience organization tends to sustain operations of their enterprise using innovative ideas in creating product, process, structure, and market [4]. Organizational resilience is defined as the capacity to quickly recover from setbacks, adjust to new circumstances,

and foresee important events based on emerging trends. Also, as previously shown [43], one of the most important resilience traits is the capacity to innovate. In today's uncertain and volatile business climate, it is essential for organizations to cultivate resilience. This will help them deal with failures, recover quickly, and ultimately succeed in the future. To thrive in unpredictable situations and ensure long-term sustainability, companies need to be prepared to deal with all these unforeseen twists and turns.

Golgeci and Ponomarov [44] describe organizational resilience as a crucial component of firm stability, with innovation being the main factor that drives its adaptability. Results from their study on supply chain management show a strong correlation between innovativeness and resilience. Other researchers use a capability-based understanding of resilience, viewing it as a capacity or ability [45,46]. Carvalho et al. [47], Rose [48], Sheffi and Rice Jr. [49], and Teixeira and Werther [50] refer to organizational resilience as being able to anticipate and deal with disruptions and surprises, both internal and external, through strategic awareness and related operational management. A company's resilience can be either static, based on pre-emptive actions to lessen the likelihood of threats and their effects, or dynamic, based on responsiveness to interruptions and surprises, mitigating negative effects as quickly as possible and maximizing the company's capacity to maintain status quo. Hence, companies that are resilient are better able to take advantage of opportunities and compete with others throughout time [51].

2.2.5. Business Sustainability

According to earlier definitions [52,53], sustainability is the capacity to meet social and economic demands without negatively impacting the environment. According to Akadiri and Fadiya [54], business sustainability encompasses elements, features, or aspects related to a firm's functioning. Furthermore, business sustainability refers to the consistency in business conditions. This occurs when a company continues to grow and develop, employs strategies to ensure its continued existence, and creates new products and services [55,56].

Aninkan and Oyewole [57] and Eccles, Ioannou, and Serafeim [58] noted that the construct of organizational sustainability has received increased awareness in academia and business executives in the past 20 years. Long-term success, however, depends on organizational sustainability, which in turn boosts short-term performance (such as earnings) and employee attitudes and behaviors (such as engagement, knowledge sharing, and creativity) in the workplace. According to Hart and Milstein [59] and Spreitzer, Porath, and Gibson [60], sustainable businesses can simultaneously improve their efficiency in three different areas: financial, ecological, and societal (or human). To attain and sustain growth, firms must have a comprehensive strategy that considers the financial, social, and environmental (i.e., human) components of expansion.

Being able to meet social and economic needs without negatively impacting the environment is essential for sustainability [53]. To achieve BUSS, one must implement policies and procedures that balance economic success with social and environmental responsibilities [10]. Governments have simultaneously paid more attention to environmental preservation, social needs, and economic goals. To maintain a competitive advantage and ensure the long-term sustainability of their businesses, numerous companies have come to realize the significance of enhancing their modernization skills [53,59].

In relation to sustainability, businesses ought not to limit their concentration to creating shareholder value; rather, they should think about how their operations will affect society, the environment, and their employees [61]. Finally, the benefits of sustainability practices will manifest as increasing profit, better products and satisfaction, increased organizational commitment, a better brand reputation, the possibility of receiving government funding, savings from more environmentally friendly logistics and supply chains, and less money spent on environmental liability and regulation.

2.2.6. Innovation Capability and Business Sustainability

Businesses prosper in today's market because they are constantly inventing new, technologically improved items through R&D efforts. Within the context of innovative capacities, refs. [62,63] evaluated the impact of product, marketing, and process innovation on company performance all at once. According to Li et al. [64] and Durge and Sangle [65], when organizations follow a sustainability perspective in their research and development, they can create products that are competitive, environmentally friendly, socially responsible, technically advanced, compliant globally, and efficient with resources.

In the study of Rauter et al. [11], it was found that sustainable firms and creative goods both had strong relationships. Another crucial organizational strategy that has received a lot of attention is service innovation, which is a component of innovation capability. Sundbo and Gallouj [66] used the phrase “service innovation” to describe the process by which businesses innovate to improve service delivery and customer support. Innovative service offering increases customer satisfaction and value [1,67]. Several studies have shown that innovation boosts business sustainability and performance [10,11], and market positions and competition [8,68].

Also, everyone knows that process innovation is a beneficial way for businesses to reach their goals. Advances to operational procedures, tools, and technologies used by businesses are essential to process innovation. Companies innovate their processes to provide customers with a faster service and more value [5]. Consequentially, process innovations that meet regulatory standards may lead to better environmental sustainability. They stated that process innovation helps entrepreneurs improve the sustainability of their firms as affirmed by [11].

Additionally, marketing innovation is a critical type of innovation that significantly impacts business growth. According to the research, marketing innovation is when a company can successfully plan and execute marketing campaigns that address not only consumer wants, but also business objectives and greater social concerns. An organization is involved in innovative marketing when it finds new ways to connect with customers, alters their perceptions of its offerings, and expands into untapped markets. A company's ability to innovate is an important part of effective marketing, which boosts the company's sustainability [69]. Thus, the assumption implies that;

Hypothesis 1. *Innovation capability has a positive effect on business sustainability.*

2.2.7. Innovation Capability and Sustainable Competitive Advantage

Within the broader framework of the capability-based theory, a company gains sustainable competitive advantage (SCA) when it possesses unreplaceable financial and strategic advantages over its rivals. There may be a connection between encouraging innovation and striving for a competitive advantage. To stay ahead of the competition, organizations must constantly innovate and find new ways to improve consumer value [70]. Proponents of the idea that innovation helps businesses gain an edge in the market and boost their performance include [71,72]. One could argue that thriving SMEs are characterized by their ability to innovate.

Some have hypothesized an intimate connection between the processes of innovation and competitive advantage. Firms gain a competitive edge when they create new ways to carry out tasks within the value chain to increase customer value [70]. Innovative capabilities are what separate the successful, growing SMEs from the unsuccessful ones. According to a recent Australian study [73], SMEs leverage both technical and non-technical innovations to derive a competitive edge in market both locally and internationally. Consequently, it is hypothesized that:

Hypothesis 2. *Innovation capability has a positive and significant effect on sustainable competitive advantage.*

2.2.8. Sustainable Competitive Advantage and Business Sustainability

Developing and sustaining a competitive advantage is of crucial significance in today's corporate environment. One way to think about SCA is as a better "marketplace position", enabling businesses to provide better customer value and/or achieve lower relative costs [74]. According to the capability-based theory, a sustainable firm has a competitive advantage when its financial and market returns become unmatched by its competitors, as well as if it cannot replicate the competitive strategy that has given it these advantages [75].

Companies in today's fast-paced markets need to constantly evaluate their internal and external environments to understand their customers' needs and wants, as well as how to best use their resources to tackle new problems and stay ahead of the competition [76]. Adopting sustainability practices is seen as a strategy for a corporation to boost consumer loyalty, attain competitiveness, and improve a company's reputation [77]. Certain research on corporate sustainability suggests that a company's adoption of sustainable business practices positively impacts brand value attributed to a specific competitor [78,79]. Dyllick and Muff [80] assert that sustainable organizations possess superior competitive advantages, which include a more developed brand reputation, lower risks, and a greater interest among talent. The investigation foregrounds the following hypothesis:

Hypothesis 3. *Sustainable competitive advantage has a positive and significant effect on business sustainability.*

2.2.9. Roles of Organizational Resilience and Environmental Dynamism

Nowadays, the idea of sustainability is gaining prominence all over the world [81,82]. Ever since then, companies have shifted their attention from solely focusing on financial gains to also taking social and environmental issues into account. If customers require adjustments or competitors quickly modify the product offered, it is critical to adapt quickly. Firms must be alert and adaptable enough to quickly respond to changing conditions. According to Jansen et al. [83], companies increase product innovation in high-stakes, dynamic environments by fostering a new way of thinking about and doing things. Put simply, businesses can turn external environmental disruptions into gains.

There has been a lot of scholarly focus on the ways in which factors external to organizations affect innovation [83–85]. The level of dynamism is an integral part of the external environment that affects how well an organization operates. Technologies, consumer tastes, and material demand and supply are all examples of variables that can quickly change in a dynamic context. In such a setting, present goods and services often become stale. Businesses cannot help but innovate and enhance their offerings in response to the constant shifts in consumer demand and industry standards. Uncertainty is a hallmark of dynamic ecosystems. Companies frequently have little data and make inaccurate forecasts about what will work since their environment is changing at such a rapid pace. Consequently, innovation is riskier in a dynamic environment.

According to Bolton, Habib, and Landells [86], their study envisaged that, when people and institutions encounter extraordinary difficulties, resilience is typically thought of as the capacity to bounce back and continue operating normally, as being a major challenge considering the complicated and continuing instability that people in different cultural and sectoral contexts experience, taking the Philippines microfinance institution as a case study. The findings outlined that, to foster transformative resilience behaviors in ever-changing ecosystems, it is crucial to uphold cultural consistency in purpose, values, and capabilities.

A company's resilience depends on its capacity to restructure and improve its operations in response to unexpected changes in the market [87]. Meanwhile, to build resilience capacities in these situations, firms should participate in practice drills that mimic future market scenarios. These drills will assist them in assessing their resilience levels, identifying the type of resilience they require, and identifying the areas where it is most critical. Companies may only achieve resilience as a sustainability strategy if they comprehend

its importance and begin to cultivate it early on; however, these exercises will eventually make adaptability an integral aspect of the firm's business culture [87].

Given that various firms have diverse cultural approaches to resilience, one wonders if building it is easier said than done when considering it as a corporate sustainability strategy. The intricate nature of grasping resilience depends on what traits enable an organization to maintain its core operations and, thus, its capacity to resist or recover from upheavals. A company's ability to wither future storms depends on its capacity for resilience. These premises are assumed for testing:

Hypothesis 4. *Environmental dynamism (ENVD) significantly mediates the relationship innovation capability and business sustainability.*

Hypothesis 5. *Organizational resilience (ORG) significantly mediates the relationship innovation capability and business sustainability.*

To achieve sustainable development, it is required to build a framework of interrelationships between the various variables, as shown in Figure 1.

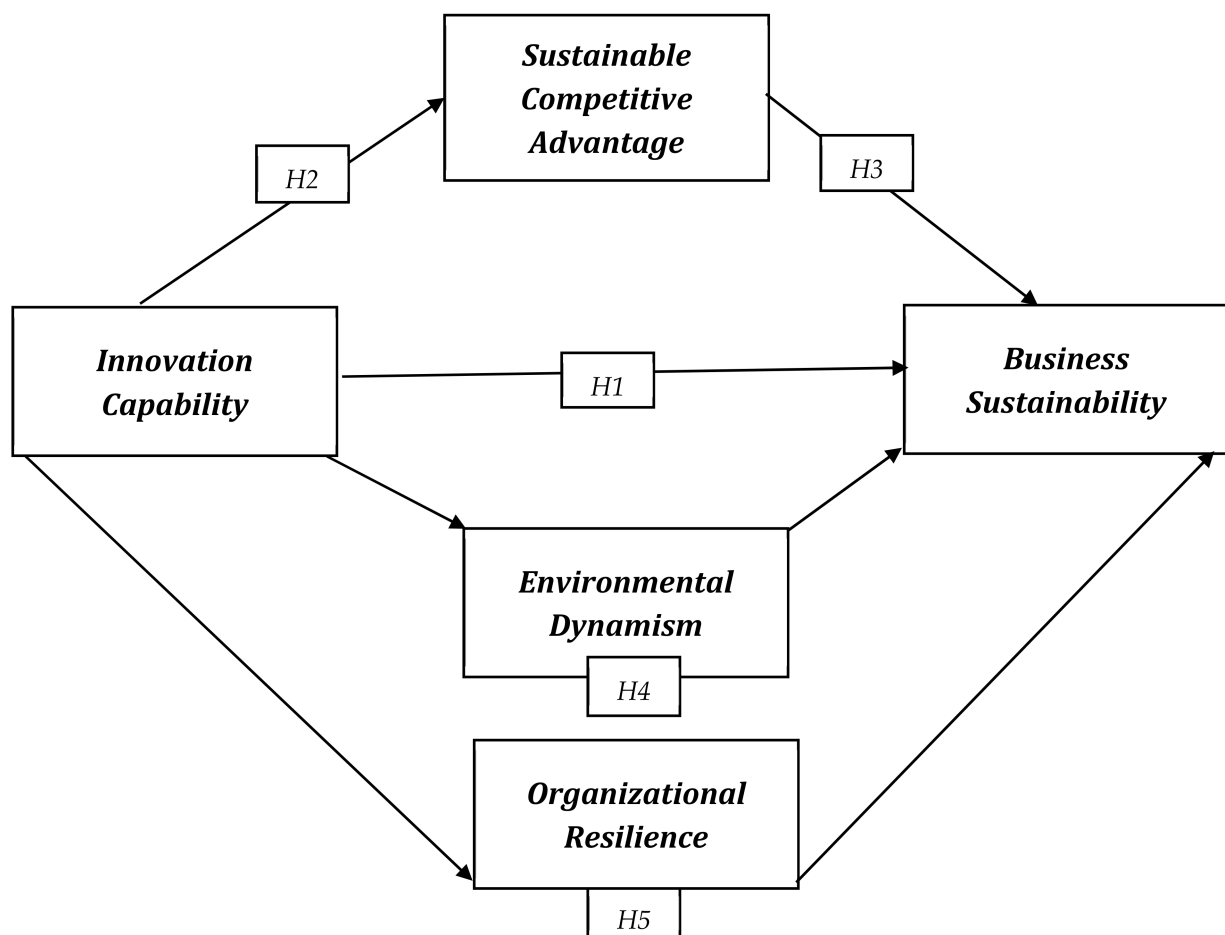


Figure 1. Model of the study.

3. Materials and Methods

3.1. Sampling Procedure and Characteristics

This research focuses on Lagos State Metropolis because it is the most industrialized center and has the highest SMEs hub in Nigeria. This study employed a cross-sectional method to explore the effect of INV on BUSS in SMEs in Lagos Metropolis, Nigeria. Data were obtained using a structured quantitative survey. Specifically, the SMEs

that were selected as the sampling frame include respondents from diverse business sectors, such as manufacturing, services, restaurants, wholesale, and retailing. According to a recent announcement from the Lagos Ministry of Commerce, Industry, and Cooperatives, 11,663 SMEs are operational in Lagos State. Based on the evidenced population, this study used the online sample size calculator and Cochran's [88] formula, as suggested by Kotrlík et al. [89], and confirmed that the minimum sample size for the study is 372 SMEs.

Assume a researcher has set the alpha level a priori at 0.05, plans to use a proportional variable, has set the level of acceptable error at 5%, and has estimated the standard deviation of the scale as 0.5. Cochran's sample size formula for these data is presented here, along with explanations as to how these decisions were made.

$$n_0 = \frac{(t)^2 \times (p)(q)}{1 + n_0 / \text{population}}$$

$$n_0 = \frac{(1.96)^2 \times (0.05)(0.05)}{(0.05)^2}$$

$$n_0 = \frac{0.9604}{(0.0025)} = 384$$

where:

t = value for the selected alpha level of 0.025 in each tail = 1.96. (The alpha level of 0.05 indicates the level of risk the researcher is willing to take that the true margin of error may exceed the acceptable margin of error).

$(p)(q)$ = estimate of variance = 0.25. (Maximum possible proportion (0.5) $\times$ 1-maximum possible proportion (0.5) produces the maximum possible sample size).

d = acceptable margin of error for proportion being estimated = 0.05 (error researcher is willing to accept).

Therefore, for a population of 11,663, the required sample size is 372. However, since this sample size exceeds 5% of the population ($11,663 \times 0.05 = 84$), Cochran's (1977) [88] correction formula should be used to calculate the final sample size.

These calculations are as follows:

$$n_1 = \frac{n_0}{1 + n_0 / \text{population}}$$

$$n_1 = \frac{384}{1 + 384 / 11,663}$$

$$n_1 = \frac{384}{1.0329} = 371.76 = 372$$

where:

population size = 11,663;

n_0 = required return sample size according to Cochran's formula = 372;

n_1 = required return sample size because the sample > 5% of population.

We conducted the data collection procedure with five hundred surveys, using the simple random sampling technique, and focusing exclusively on managers and owners of SMEs. As a result, we obtained 401 valid responses, yielding a response rate of 80.2%, indicating adequate data for the study.

Once a list of responses from the chosen businesses was generated, the participants were approached thereafter, using the following processes to acquire the data, within six months (July 2023 to December 2023). (a) Two business professionals in the field and two professors from different universities reviewed and approved the questionnaires to make sure they were clear and relevant. (b) Before sending the surveys, the participants were contacted to explain the study's aims and obtain their consent to participate. (c) The participants were guaranteed complete anonymity and the utmost confidentiality of their

data. (d) A few recommendations on how to fill out the surveys were included to minimize possible errors.

This study's sample comprised 46.6% males and 53.4% females, as shown in Table 1. On average, the majority was married and fell within the age range of 41–50 years, with the youngest being under 30 years old. The analysis of their educational qualifications showed that the majority (51.6%) had a bachelor's degree, followed by a diploma or NCE (26%), and the least had a postgraduate degree as their highest qualification. Finally, regarding business operation experience, it was established that most respondents had operated a small trade business for quite a long period (5–10 years), while 22.9% of the respondents had less than 5 years' experience. The remaining participants affirmed that they had more than ten years of experience in the business sector.

Table 1. Demographic profile of the respondents.

Variables	Categories	Freq (<i>n</i> = 401)	Percentage
Gender	Male	187	46.6
	Female	214	53.4
Age	18–30 years	57	14.2
	31–40 years	113	28.2
	41–50 years	169	42.1
	Above 50 years	62	15.5
Highest Educational Level	High-school certificate	59	14.7
	Diploma/NCE certificate	104	26.0
	Bachelor's degree	207	51.6
	Postgraduate	31	7.7
Marital Status	Single	93	23.2
	Married	280	69.8
	Divorced	28	7.0
Years of Operation	Below 5 years	92	22.9
	5–10 years	162	40.4
	Above 10 years	147	36.7

Source: author's Computation, 2024.

3.2. Measures and Analytical Technique

A modified survey from the existing literature on the chosen constructs was adopted for this study (see Appendix A). We used nine items from the scale [90], as cited by [91], to assess business sustainability. Furthermore, this research measured innovation capability using 5 items from the studies of [10,43,92]. Hou et al. [36] cited the four validated items developed by Jansen et al. [93] to measure environmental dynamism. Prahalad [41], Snow, and Hrebiniak [42], and Rahmat [94] developed a six-item assessment of sustainable competitive advantage, viewing it across core competencies and distinctive competencies. Finally, we adopted a 5-item scale to assess organizational resilience, drawing on the research from [95–97]. Hence, this research employed a five-point Likert scale from previous studies, where 1 signifies a strongly disagree option and 5 indicates a strongly agree option, as well as 1 representing a “never” option and 5 connoting an “always” option (see Appendix A). Finally, the descriptive statistics and “Partial Least Square Structural Equation Modeling” (PLS-SEM) were used to check basic assumptions and describe the data gathered. This study analyzed the model fit using metrics such as the “standardized root mean square residual” (SRMR), “normal fit index”, and others to determine how well the research model matched the data.

4. Results

4.1. Analysis of Results

This study used the full collinearity test, presented in the next section, as well as Harman's CFA and single factor test to confirm the potential presence of common method

variance bias among constructs. When all 29 measurement items for the constructs were assessed using a single common factor, the general latent variable's overall variance explanation fell below Harmin's threshold value of 50%, which means that there was no common method bias in the final model.

4.2. Multicollinearity Test and Correlations

Establishing confidence, the data are free of major flaws required for multicollinearity testing before proceeding to further analyses. If the correlation between two or more variables in the model is 0.9 or higher, we consider them multicollinear [98]. We can examine this using several techniques. But, we focused on the VIF—the most popular metric—to compare things. The statistical analysis in Table 2 shows no indications of multicollinearity, as the VIF values in the whole collinearity test fall within the allowed range (less than 5). Previous research [99] supports this finding.

Table 2. Structural model multicollinearity (inner VIF values).

Variables	BUSS	ENVD	ORG	SCA
Business Sustainability (BUSS)	-	-	-	-
Environmental Dynamism (ENVD)	2.134	-	-	-
Innovation Capability (INV)	3.007	1.000	1.000	1.000
Organizational Resilience (ORG)	2.313	-	-	-
Sustainable Competitive Advantage (SCA)	2.639	-	-	-

Source: Author's computation, 2024.

4.3. Assessing the Measurement Model

Previous studies extensively employ Cronbach's alpha coefficient, known for its precision when assessing internal consistency across measurement items, to evaluate the reliability of measurement scales. The present study also employed this reliability estimate. Business sustainability (0.923), environmental dynamism (0.850), innovation capability (0.818), organizational resilience (0.918), and sustainable competitive advantage (0.867) all had Cronbach's alpha values greater than the lowest threshold of 0.7, as established by [100,101]. In addition, we tested the reliability assumptions using composite reliability, and the results demonstrate that all structures have acceptable range values.

Furthermore, the PLS algorithm was used to perform confirmatory factor analysis (CFA) after eliminating surveys with missing data or incomplete responses. We conducted a CFA analysis to ensure the error-free nature of the items used for measurement. We used a CFA to guarantee that each construct's items were one-dimensional and to estimate the measurement model before moving on to the structural model and hypothesis testing. To accomplish this, we verified that each measurement component had a factor loading greater than 0.5, as shown in Table 3. Furthermore, Table 3 reveals that the AVEs of all the constructs are greater than 0.5, implying that convergent validity is present. Therefore, the end results of the CFA meet the convergent validity requirements.

Table 3. Measurement model.

Latent Variables	Loadings (λ)	CA	Rho_A	CR	AVE
Business Sustainability	BUSS	0.923	0.928	0.937	0.623
BUSS1	0.750 ***				
BUSS2	0.817 ***				
BUSS3	0.844 ***				
BUSS4	0.809 ***				
BUSS5	0.765 ***				

Table 3. Cont.

Latent Variables	Loadings (λ)	CA	Rho_A	CR	AVE
BUSS6	0.630 ***				
BUSS7	0.801 ***				
BUSS8	0.830 ***				
BUSS9	0.835 ***				
Environmental Dynamism	ENVD	0.850	0.856	0.899	0.691
ENVD1	0.822 ***				
ENVD2	0.867 ***				
ENVD3	0.868 ***				
ENVD4	0.765 ***				
Innovation Capability	INV	0.818	0.822	0.873	0.579
INV1	0.750 ***				
INV2	0.721 ***				
INV3	0.836 ***				
INV4	0.754 ***				
INV5	0.739 ***				
Organizational Resilience	ORG	0.918	0.919	0.939	0.757
ORG1	0.911 ***				
ORG2	0.911 ***				
ORG3	0.795 ***				
ORG4	0.920 ***				
ORG5	0.804 ***				
Sustainable Competitive Advantage	SCA	0.867	0.866	0.900	0.601
SCA1	0.798 ***				
SCA2	0.702 ***				
SCA3	0.733 ***				
SCA4	0.783 ***				
SCA5	0.821 ***				
SCA6	0.808 ***				

Source: Author's computation, 2024. CA = Cronbach's alpha, CR = composite reliability, rho = rho_A reliability index, AVE = average variance extracted. $p < 0.05$ ***.

4.4. Discriminant Validity

Following the advice of Fornell and Larcker, a discriminant validity test was conducted for each construct. The authors stress that discriminant validity is achieved when the square root of the AVE values for each construct is higher than the correlations between constructs. Hessenler et al. [102] state that the Fornell–Larcker [103] criterion was criticized, prompting the development of the heterotrait–monotrait (HTMT) correlation ratio as an alternative. Following Kline's [104] recommendation, all measurement model structures displayed in Table 4 have HTMT values below 0.9. According to Table 4, the assumptions regarding discriminant validity are valid.

Table 4. Discriminant validity.

Variables	BUSS	ENVD	INV	ORG	SCA
Business Sustainability (BUSS)	^a 0.789	^b 0.669	0.881	0.706	0.814
Environmental Dynamism (ENVD)	0.599	0.831	0.683	0.773	0.649
Innovation Capability (INV)	0.775	0.576	0.761	0.720	0.827
Organizational Resilience (ORG)	0.653	0.694	0.639	0.870	0.600
Sustainable Competitive Advantage (SCA)	0.741	0.564	0.745	0.547	0.775

Source: Author's computation, 2024. ^a = Diagonal values in bold are the square root of AVE, ^b = Italicized values above the square root of AVE are Heterotrait-Monotrait (HTMT) ratios.

4.5. Assessing the Structural Model

We used SmartPLS software version 4 to extract the statistical findings from the structural model, which we then used to test our hypotheses. After maintaining acceptable item factor loadings in the measurement model, as indicated above, it was possible to verify the assumptions. Table 5 displays the results of all the tests pertaining to the structural model and the hypothesis relationship. H1 is accepted because, as shown in Table 5, innovation capability positively affects business sustainability ($\beta = 0.384$, $t\text{-value} = 4.860$, $p < 0.05$) and significantly impacts sustainable competitive advantage ($\beta = 0.776$, $t\text{-value} = 29.530$, $p < 0.05$), supporting the acceptance of H2. In conclusion, H3 is approved because the results show that sustainable competitive advantage significantly improves BUSS ($\beta = 0.250$, $t\text{-value} = 4.132$, $p < 0.05$). Both innovation capability and sustainable competitive advantage can explain a total of 66.7% of the variation in business sustainability, while INV accounts for 60.2 percent of SCA. Thus, it implies that the variables have a high explanatory predictive power (see Figure 2).

Table 5. Path analysis result.

Model Fit Summary		SRMR = 0.076			NFI = 0.760		Chi-Square = 3675.568	
Hypotheses		Std. Beta	Std. Error	T-Value	p-Value	F ²	R ²	Decision
H1	INV → BUSS	0.384	0.079	4.860 ***	0.000	0.143	0.667	Supported
H2	INV → SCA	0.776	0.026	29.530 ***	0.000	1.502	0.602	Supported
H3	SCA → BUSS	0.250	0.061	4.132 ***	0.009	0.112	0.667	Supported
Indirect Effects (Mediation)								
H4	INV → ENVD → BUSS	0.057	0.026	2.194 **	0.028	Full Mediation		Supported
H5	INV → ORG → BUSS	0.130	0.038	3.389 **	0.001	Full Mediation		Supported

Source: Author's computation, 2024. Significant at $p < 0.01$ **; $p < 0.05$ ***.

Environmental dynamism is said to have a great effect on the link between innovation and business sustainability (H4: $\beta = 0.057$, $t = 2.194$, $p < 0.05$), and organizational resilience is said to fully mediate this relationship (INV → ORG → BUSS) (H5: $\beta = 0.130$, $t = 3.389$, $p < 0.05$). Reporting the substantive significance (F^2) alongside the beta coefficient (β), statistical significance (p -value), and variance explained (R^2) was finally suggested by Sullivan and Feinn (2012) [105]. Cohen [106] said that path (INV → SCA) had a very high antecedent effect of innovation capability on sustainable competitive advantage because its F^2 value is higher than the high-effect threshold (>0.35). On the other hand, paths (BUSS → INV) and (BUSS → SCA) recorded low-effect sizes, since the F^2 value fell within the threshold range of 0.02–0.15.

Finally, when SRMR is below 0.08 and NFI falls between zero and one, indicators like these become essential for evaluating the overall goodness of fit (GoF). With an SRMR of 0.076 and an NFI of 0.760, the data match the study model closely. Therefore, the model's correlation coefficient is sufficiently accurate to validate the hypothesis.

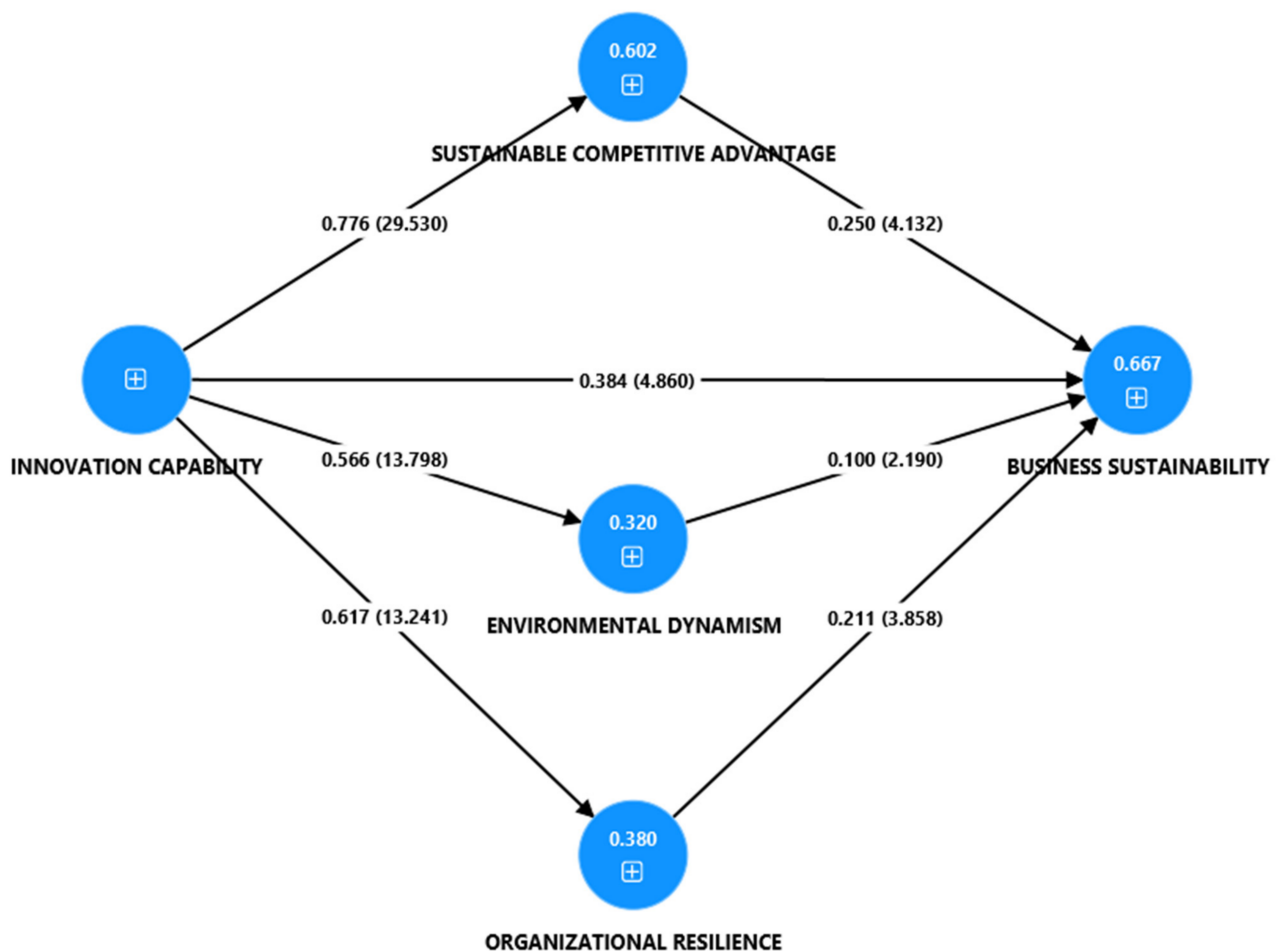


Figure 2. The structural model results.

5. Discussion

In the context of SMEs, this finding sets out to determine whether innovation capabilities specifically impact business sustainability. Previous studies [107,108] have highlighted the importance of innovation in achieving business sustainability. Numerous studies have shown that firms that provide groundbreaking products comply with acceptable operational norms and fulfil diverse market demands by enhancing product characteristics that have a higher likelihood of long-term success and resilience while competing with others. Hallstedt et al. [109] presented further evidence supporting the notion that innovation, namely in terms of product development, has a significant influence on the long-term viability of firms. This is especially true when companies introduce novel products that include distinctive environmentally friendly attributes. This study's findings corroborated the first hypothesis, which postulates that innovation contributes to the long-term viability of businesses. Therefore, we recommend that SMEs prioritize investing in innovations in four domains: product, process, structure, and market. This is because improving their capability is critical to attaining a long-term competitive advantage and sustainability.

Furthermore, this study's results support the second hypothesis, which posits that innovation enhances the sustained competitive advantage of SMEs. The statistical analysis proved that the ability to innovate enhances a company's strategic competitive advantage. The findings are consistent with those of [69], who examined the relationship between innovation (marketing) and its potential to promote sustainable development. Teguh et al. [110] conducted a study that analyzed the relationship between entrepreneurial marketing and long-term competitive advantage in food and beverage MSMEs through the lens of innovation capability. They discovered that performing good work in this area of innovative capability provided them a long-term advantage over their competitors.

Furthermore, refs. [111,112] cited previous research that corroborated the requirement for innovation when helping businesses better understand their target markets and consumers' wants and needs to provide superior products and services. Hence, this is required to effectively compete with competitors within the same business.

In relation to the second hypothesis and affirmation from previous studies, Lee and Hsieh [113] discovered a direct correlation between a firm's innovation capability and its competitive advantage. Research by [114–116] all presented the same conclusion: innovation greatly impacts performance and competitive advantage. Ref. [117] demonstrated that a company's age significantly influences the benefits of innovation for competitive advantage. Innovations in processes and products positively impact organizational competitive advantage [118]. In conclusion, businesses and SMEs that are continuously seeking out innovative approaches to sustainable design and quality will be the first to reap the rewards. Thus, the capacity to innovate in the areas of design, product, process, marketing, and service will foster excellent performances and long-term competitive advantages.

Hypothesis 3 asserts that a firm can sustain a competitive edge over an extended period and receives more support from this study. Supporting the claims made by Baker et al. [119] and Porter [120], there is evidence that sustainable competitive advantage promotes business sustainability, according to Porter [118], who calls competitive advantages a companion for competitive strategy. On the contrary, ref. [121] argues that unfavorable attitudes and values might greatly hinder a company's capacity to sustain its competitive advantage in the foreseeable future. However, the study's findings do not fully corroborate the literature. They support the capital-based theory, which relies on scant research, to date, in its quest to define competitive advantage in business environments.

The fourth hypothesis posits that environmental dynamism serves as a mediator between the capacity for innovation and the long-term sustainability of enterprises. The mediation effect leads to a more evident manifestation of the innovation dimension and the ability of small and medium-sized enterprises (SMEs) to leverage environmental measures for their long-term business success. Small and medium-sized enterprises (SMEs) operating in highly dynamic environments received far more returns from innovation. This unexpected finding underscores the significance of employing flexible strategies to address evolving environmental conditions and demonstrates how small and medium-sized enterprises (SMEs) can use environmental issues to achieve sustained success.

The effective management of environmental dynamism is critical for an organization's long-term performance because it guides the company to acquire, adapt to, and implement dynamic changes in the environment [34]. Extending beyond the initial assumptions, the findings indicate that environmental dynamism plays a mediating role. Environmental dynamism, which brings to light the environmental challenges faced by firms, can help with meeting customer demands, maximizing profitability, and ensuring a sustainable future [122]. Conversely, firms face the possibility of financial losses if they disregard the changes in their environment. Therefore, if SMEs fail to consider environmental dynamic factors while pruning their businesses, sustainability is at risk. Despite the growing awareness among businesses about the long-term social and environmental consequences, firms often fail to consider how they may contribute to addressing sustainability issues at the local, national, or global scales [80]. Nevertheless, businesses that are truly sustainable aim to positively impact society and the environment through innovation.

This study fully supports H5, which examines the mediating role of organizational resilience regarding innovation capability and business sustainability. Enterprises can demonstrate resilience and implement the necessary modifications as part of their sustainability strategy. Even though business failure is an unanticipated and unavoidable interruption to their economic activity, resilience can empower them to provide good results (solutions), regardless of the intensity of the disruption they face. Firms may enhance their ability to withstand unpredictable changes and thrive in the new, normal market environment by redirecting their focus from concentrating on disruptions they encounter to the level of tolerance they can maintain. To promote resilience as a sustainable strategy

for enterprise transformation, modern firms, such as SMEs, must avoid complacency and integrate agility and flexibility into their resilience strategy. Hence, resilience and sustainability have become critical issues for a sustainable future amid extraordinarily difficult financial conditions.

6. Conclusions

The present study majorly focusses on sustainable business performance among Nigerian SMEs. This study aims to investigate the roles of environmental dynamism and organizational resilience in achieving a sustainable competitive advantage and sustainable business performance, with innovation capability serving as a crucial antecedent. The results show that models for sustainable development want to improve the “business as usual” view by using a more axiological and systemic approach. For example, this study is based on SDG 9 (industry, innovation, and infrastructure). Therefore, innovation capability plays a crucial role in enhancing the positive impact of SCA on BUSS. Finally, the presence of environmental dynamics and resilience in organizations like SMEs ensures innovation capability, which increases SMEs’ sustainable business performance. Therefore, we urge businesses to implement these sustainable practices to stay competitive and meet the growing customer demand for high-quality products and services.

6.1. Theoretical Contribution

By providing fresh insights and building upon previous theories, the results of this study make a substantial addition to the theoretical areas of BUSS and INV. In the first place, this study builds and evaluates a theoretical model for SMEs in Nigeria that incorporates INV, ENDV, ORG, and BUSS. This study adds to the literature by providing empirical evidence for the hypothesized correlations between innovation capability and sustainable business practices in the SME sector, therefore enhancing our understanding of the topic. In addition, this study adds to the body of knowledge on the capital-based theory and contingency by placing it in the context of small and medium-sized enterprises (SMEs) in developing nations, with a focus on the commercialization hub of Lagos Metropolis, Nigeria.

This study shows that the dual theory, contingency and capital-based, is relevant and applicable to small and medium-sized enterprises (SMEs) in developing markets, even though most previous research focuses on large firms and developed economies [110]. This research adds to the existing body of knowledge on the topic of small and medium-sized enterprises (SMEs) in Nigeria by shedding light on the ways in which innovation capability promotes company sustainability. The implications for understanding how to achieve a competitive edge in the ever-changing economic landscape are substantial. The interaction between enhancing company sustainability through innovation capabilities, environmental dynamism, and organizational resilience establishes a broader theoretical meaning. This adds to our knowledge of strategic management theories by highlighting how crucial it is to adapt environmental strategies to changing external circumstances to attain long-term success [91,123,124].

Finally, small and medium-sized enterprise (SME) owners and managers can benefit from the contingency theory’s framework by learning how to be resilient and environmentally conscious and friendly in their pursuit of innovation. Adopting a sustainable environment through innovative capabilities and considering product, process, marketing, and organizational innovation paradigms allows firms to produce more high-value products for all stakeholders. Lastly, innovation, when performed right, can boost a company’s competitiveness and long-term sustainability, leading to a brighter commercial future.

6.2. Practical Implications

Present findings offer foremost inferences for managers and business practitioners. Firstly, managers need to understand that for their companies to gain unique competitive advantages, business sustainability is crucial. To achieve their goals, business professionals

may use the suggested framework to try to incorporate innovation tactics and sustainability practices into their companies. To recap, the most effective strategy for a company to achieve long-term success and survival is to innovate. With competition heating up in today's fast-paced business world, companies are under pressure to innovate to stay ahead of the competition.

This study contributes to the repository of literature on sustainable business practices as they pertain to SMEs by expanding our grasp of the interplay between innovation capacity, organizational resilience, sustainable competitive advantage, and environmental dynamism. We empirically validate our conceptual framework and provide practical insights for small and medium-sized enterprises (SMEs) seeking to integrate environmental concerns into their strategic agenda. This will help them better handle complex environmental challenges and achieve long-term sustainability in their business.

Furthermore, we think this study adds to what is already known about the connections between SME innovation capabilities and the sustainability of the company. With any luck, this study will pave the way for additional theoretical elaboration and empirical investigation in this important area of study. Firms should prioritize strengthening their innovation capabilities while implementing sustainable practices, according to the statistical data. This tends to be valid when launching new products and building or improving production processes to boost performance. An important asset of any company is its capacity to create new and useful ideas things, viz a viz processes, services, marketing, or products improvements.

This research on the social, economic, and environmental aspects of business sustainability presents a promising understanding for government and small and medium-sized enterprise (SMEs) regulatory bodies at both local and national levels. Through innovation and resilience capacity, these bodies can establish policies, regulations, and economic conditions that foster sustainability and competition amidst environmental changes. Despite the presentation of SMEs as a homogeneous group, they differ significantly in size, industry, and maturity, which inevitably impacts their capacity to innovate and adapt. This study is crucial for the industry to implement policies that enhance the accessibility and adaptability of innovation strategies, while also critically examining the factors that influence the adoption of innovation and resilience in the day-to-day operations of enterprises experiencing environmental dynamism.

Given the inherent complexity of sustainability, the necessity of implementing a contingency strategy may become evident. Nonetheless, prior research on corporate sustainability has only applied moderating variables like industry and firm size to explain the correlation between sustainability-related practices and innovation performance. Meanwhile, the presentation of SMEs as a homogeneous group, despite significant differences in size, industry, and maturity, remains inevitably impactful to the capacity to innovate and adapt. This study remains crucial for the industry to implement policies that enhance the accessibility and adaptability of innovation strategies while also critically examining the factors that influence the adoption of innovation and resilience in the day-to-day operations of enterprises experiencing environmental dynamism. Therefore, the creation of platforms for knowledge exchange and skill development can facilitate SMEs in effectively navigating the complexities of innovation to align with sustainability practices.

Accordingly, business owners, industry and practitioners can use the research's practical implications to better understand how to invest in innovation to boost sustainability performance. Considering the foregoing, we are of the opinion that SMEs benefit greatly from innovative skills, which allow them to achieve their economic, social, and environmental performance goals. We also advise business practitioners to form fruitful partnerships with supply chain participants, which could aid them in developing innovative, and environmentally friendly products.

6.3. Limitations and Future Research

Several caveats should be considered for potential future expansions of this study. The main rationale of this research was to investigate the impact of innovation capability on business sustainability. We expect further study to analyse BUSS (economic, environmental, and social) and INV (product, process, service, and market) as second-order constructs, explicitly addressing their dimensions. Secondly, future research can expand geographical location to a developed nation and scope to include related and larger competitive industries, such as manufacturing, FMCG, and agro-allied companies.

Furthermore, consideration of the intervening variables as a mediator or moderator seems to be a novel idea in establishing sustainability, as well as introducing control variables like age of enterprise, monthly income, and educational background. In addition, we restricted this study's sample size to SME owners and managers. Hence, to avoid violating the validity and trustworthiness of the results, future studies should use larger samples and focus on reactions from an employee perspective in the context of employee resilience and employee co-innovation. Finally, the study's data originated from Nigeria (a developing nation); future researchers can always try to replicate the model in other parts of the world to see if it works, most especially in an undeveloped nation.

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Appendix A. Questionnaire

Indicators	Business Sustainability (Yong et al., 2020 [90]; Tekala et al., 2024 [91])
BUSS1	Significant increase in the general level of revenues.
BUSS2	Significant increase in the general level of market shares.
BUSS3	Significant improvement in the general level of sales growth.
BUSS4	Significant increase in the general level of investment.
BUSS5	Significant increase in overall income.
BUSS6	Significant improvement in its overall environmental situation.
BUSS7	Decrease in costs for materials purchasing.
BUSS8	Improved occupational health and safety of employees.
BUSS9	Increases social reputation.
Key: 1—Strongly disagree, 2—disagree, 3—undecided, 4—Agree, 5—Strongly agree	

Indicators	Innovation capability (Olaleye et al., 2021 [4]; Olaleye et al., 2024 [10]; Deshpandé et al., 1993 [92]) In a New Product and Service Introduction, How Often is Your Company (Enterprise)...
INV1	First-to-market with new products and services
INV2	Later entrant in established but still growing markets
INV3	Entrant in mature, stable markets
INV4	Entrant in declining markets
INV5	At the cutting edge of technological innovation
	Key: 1—Never, 2—Ever, 3—Sometimes, 4—Often, 5—Always
Indicators	Environmental dynamism; Hou et al., 2019 [36]; Jansen et al., 2006 [93]
ENVD1	Changes in our market environment are very intense
ENVD2	Clients in our markets regularly demand completely new products and/or services
ENVD3	The markets in which we operate are constantly experiencing changes
ENVD4	Demand fluctuates rapidly and frequently in our markets
	Key: 1—Strongly disagree, 2—disagree, 3—undecided, 4—Agree, 5—Strongly agree
Indicators	Sustainable competitive advantage (Prahalad, 1993 [41]; Snow & Hrebiniak, 1980 [42]; Rahmat, 2024 [94])
SCA1	Access to raw materials
SCA2	Efficient process and technology
SCA3	Access to efficient product distribution and sales
SCA4	Efficient company operations
SCA5	Extensive business network
SCA6	High profit rate
	SCA 1–3 (core competencies) SCA 4–6 (distinctive competency) Key: 1—Strongly disagree, 2—Disagree, 3—Undecided, 4—Agree, 5—Strongly agree
Indicators	Organizational resilience (Zulfiqar et al., 2017 [95]; Gunasekaran et al., 2011 [96]; Ates & Bititci, 2011 [97])
ORG1	The business has strong social connections.
ORG2	The business finds it easy to adapt to changing situations.
ORG3	The management team is optimistic, even when things are difficult.
ORG4	The management team is usually calm in high-stress situations.
ORG5	The leader/manager feels confident in the abilities of employees to tackle problems.
	Key: 1—Strongly disagree, 2—Disagree, 3—Undecided, 4—Agree, 5—Strongly agree

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