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BUSINESS MODEL INNOVATION AND SMES' RESILIENCE: TECHNOLOGICAL ROADMAP IN NIGERIA

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Abstract. Business sustainability is a factor that businesses, especially SMEs, are giving more and more thought to. Businesses are now looking for methods to integrate sustainable practices into their operations while keeping their business models intact as a result. This study primarily looks at how technology might improve company resilience in order to investigate the connection between SMEs' business models and their pursuit of sustainability. To enable the study's main goals be achieved, three hypotheses were developed. The study's goal was explained using the Resource Based View Theory, Dynamic Capability Theory, and Institutional Theory. By combining purposive and convenience random selection approaches, the researchers performed a field survey of 420 SME operators in Nigeria in order to meet this goal. Smart PLS 3.0 was utilized in the study to evaluate the information gathered. Specifically, they assessed the extent and strength of the correlations between these constructs using path coefficients, t-statistics, R-square values, and p-values. According to the study, technology competence moderates the association between business model innovation and businesses' resilience, indicating that by utilizing technological skills, business model innovation's beneficial effects on a firm's resilience may be amplified. The technology acceptance concept, which contends that adopting new technology may enhance organizational performance, is supported by this research. As SMEs frequently deal with budget limitations and technology difficulties, the study's findings have significant significance for them. SMEs may be better positioned to survive upheavals and develop resilience by adopting new business strategies and utilizing technical skills. The study discovered that in order to increase their resilience, SMEs must actively adapt to fast-paced and competitive environments using their internal strengths. This indicates that SMEs must assess the value of innovation models in relation to their specific line of business. The study emphasizes the significance of the network interaction between technological innovation, business model innovation, and SMEs' resilience. The capacity to use technology, which is essential for boosting SMEs' resilience, strengthens this link. In summary, this study offers a current road map for technical development in the context of novel business models and the resilience of SMEs in Nigeria. This study offers helpful insights for SMEs looking to improve their business models and increase their sustainability in the face of shifting economic and environmental conditions by examining the connections between business model innovation, SMEs' resilience, and technology.

Keywords: business model, innovation, resilience, SMEs, Nigerian economy, technology.

JEL Classification: L26, O32, M13, M21.

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1. Introduction

Business model innovation (BMI) is the process of establishing fresh approaches to a company's value creation, delivery, and capture. By reevaluating how a firm functions, it entails finding new potential for income streams, cost reductions, and competitive advantage. Particularly among small and medium-sized businesses (SMEs), there has been an increase in interest in BMI recently as a way to increase their long-term sustainability and resilience to external shocks.

Numerous empirical investigations have looked into the connection between BMI and the toughness of SMEs. For instance, a research by Gavetti and Levinthal (2000) found that businesses that used BMI had a higher survival rate during tough economic times. In a similar vein, a 2010 study by Zott et al. (2012) indicated that businesses that pursued creative and unconventional business models fared better than those that depended on conventional business models in terms of survival rates.

The elements that lead to effective BMI among SMEs have been examined in several research. For instance,

Chesbrough and Rosenbloom's study from 2002 indicated that companies that engaged in open innovation – working with outside partners to create new goods and services –were more likely to effectively reinvent their business model. According to a different research by Tidd and Bessant (2020), SMEs that encouraged experimentation and risk-taking were more effective at creating and implementing innovative business models.

Additionally, there is evidence to support the idea that SMEs may become more resilient and BMI can be facilitated by the adoption of digital technology (Ibidunni et al., 2021b; Olokundun et al., 2022a; Ufua et al., 2022b). According to a research by Linder and Cantrell from 2001, SMEs were able to create new income streams and boost their competitiveness by incorporating digital technology into their business models. Similar to this, a 2013 research by Al-Debei et al. (2013) discovered that digital technology might be utilized to enhance the efficacy and efficiency of company operations, enabling SMEs to adjust to shifting market conditions more rapidly.

Undoubtedly, the difficulties SMEs in Nigeria face are particular and call for special consideration. In Nigeria, a number of obstacles, such as restricted access to funding, inadequate infrastructure, a challenging regulatory environment, a lack of technical skills, and restricted access to information and knowledge, make it difficult to innovate business models and maintain the resilience of SMEs (Conz et al., 2017; Ibidunni et al., 2021c).

Nigeria has a robust SME sector and a quickly expanding economy, but the difficulties faced by the nation's small enterprises are enormous. It can be challenging for many SMEs in Nigeria to innovate their business models and increase their resilience to external shocks because of their restricted access to finance, inadequate infrastructure, and challenging regulatory environments.

The difficulties of business model innovation and the resiliency of SMEs in Nigeria have been addressed in a number of empirical studies. A research by Oluwaseyi et al. (2019), for instance, discovered that Nigerian SMEs experience considerable difficulties in obtaining financing, which might limit their capacity to invest in new technologies and procedures to develop their company model. The report also emphasized how crucial it is to forge solid alliances with partners, suppliers, clients, and other stakeholders in order to promote innovation and boost resilience.

Ogunnaike et al. (2014) investigated the effect of the regulatory environment on SMEs' capacity for innovation in another research. The study discovered that SMEs may find it challenging to secure the appropriate licences and licenses to operate, which might impede their capacity to innovate and compete in the market. The study also emphasized the value of establishing networks and working together with other SMEs to exchange information and resources, which can aid in overcoming these difficulties.

In addition to these difficulties, SMEs may find it difficult to reinvent their business models due to a lack of technical proficiency and understanding. According to a research by Adisa and Rose (2013), many Nigerian SMEs lack the technical know-how and expertise needed to adopt new technologies and processes and reinvent their business models. The report suggested that in order to aid SMEs in acquiring these skills, government organizations and other stakeholders should offer training and assistance.

Technology is now a key factor in driving innovation in SMEs, enabling manufacturing that is quicker, simpler, and less expensive than that of big businesses. Rashid and Ratten (2021) argued that the quick rate of technology development is frequently at the forefront of the many obstacles that small and medium-sized businesses (SMEs) encounter in the current business environment. Ufua et al. (2020) argued that many SMEs are at a disadvantage in terms of competitiveness, efficiency, and creativity because they lack the financial and technological resources necessary to stay up with the most recent technology advancements. Even the most market-leading product, however, might fail due to internal opposition to change or a lack of internal adjustments. This essay focuses on how SMEs' resilience may be increased through business model innovation utilizing technology as a guide.

2. Literature review

2.1. Business Model Innovation (BMI)

According to Abdelkafi et al. (2016), the process of developing a new or updated method of doing business that enhances an existing model is known as business model innovation. A company's income streams, cost structure, value offering, or client base may need to alter as a result. In today's quickly evolving business climate, where organizations must adapt to new technology, fluctuating customer tastes, and change market dynamics, business model innovation is becoming more and more crucial.

Business model innovation has been proved via empirical research to have a big positive impact on businesses (Abdelkafi et al., 2016; Mustafa & Werthner, 2019; Ibidunni et al., 2021b). Business model innovation is described by Casadesus-Masanell and Ricart (2019) as the search for new company logics and new methods of producing and extracting value for its stakeholders. In contrast to businesses that did not explore business model innovation, those who did experienced a 20% rise in revenue growth, according to a Deloitte research. Ufua et al. (2020) emphasized that businesses that sought business model innovation also had a higher likelihood of growing their market shares, becoming more profitable, and improving customer satisfaction.

The case for business model innovation may be made in a number of ways. First, it may assist businesses in standing out from their rivals and developing a special value offer that appeals to clients. Second, it may assist businesses in adapting to market developments including the appearance of fresh technologies or modifications in client tastes. Thirdly, by streamlining processes and supply chains, it may help businesses become more

cost-effective and efficient. Fourth, a company's ability to enter new markets and consumer groups can help it grow and generate more income. This implies that businesses that successfully innovate their business models have a higher likelihood of outpacing the competition, achieving growth and profitability, and adding value for their clients.

2.2. Dimensions of Business Model Innovation (BMI)

In recent years, academic study and corporate practice have placed an increasing amount of emphasis on the concept of business model innovation (BMI). Researchers such as Olokundun et al. (2022b) and Ufua et al. (2021b) have found a number of BMI parameters that may be used to evaluate and compare the efficacy of various business strategies.

2.2.1. Value creation

The process of creating value for customers, shareholders, and other stakeholders is known as value creation and is a key idea in business. firms that emphasize value creation outperform their rivals in terms of revenue growth, profitability, and shareholder returns, according to research conducted on 400 firms in the US, Europe, and Asia by Brodsky and Oakes (2017). They contend that businesses are more likely to experience sustainable long-term growth if they generate value for all stakeholders.

Chen and Chen (2010) discovered that the success of online social networking platforms depended heavily on value generation. They contend that by giving its users additional opportunities for connection and information sharing, popular platforms like Facebook and LinkedIn added value for their users. Similar to this, Ozdemir et al. (2020) discovered that value creation was an important factor in driving innovation and competition. They contend that businesses that concentrate on adding value for their clients are more likely to be creative and prosperous in the long run.

Value creation, according to Choi and Burnes (2013), was a crucial element in the success of product development programs. They contend that businesses that prioritize providing value to clients are more likely to create profitable items that cater to their demands. Value creation, according to Cheah and Wang (2017) research, was a major factor in innovation performance. They contend that businesses that concentrate on adding value for their clients are more likely to be creative and prosperous in the long run.

Overall, these empirical investigations show how crucial value creation is to promoting corporate success and expansion. Businesses that put the production of value for all stakeholders first are more likely to experience long-term, sustainable growth, to be creative, and to produce products that are in demand.

2.2.2. Value proposition innovation

This dimension entails offering clients with novel goods or services that more effectively suit their demands in order to create new value for them. According to Teece (2019), this is the essential component of BMI that sets successful businesses apart from their rivals. Indicator of Value A key component of business model innovation (BMI) is innovation, which entails giving consumers additional value by offering them distinctive goods or services that more effectively suit their needs. Osterwalder and Pigneur (2010) assert that a company's value proposition is the foundation of its business model and decides whether the firm will succeed or fail. They contend that successful businesses are those who are able to develop a distinctive value offer that appeals to their target clients.

According to Kim and Mauborgne (2004), businesses that concentrate on value proposition innovation may carve out "blue oceans" of untapped market territory where rivalry is unimportant. They cite businesses like Cirque du Soleil and Southwest Airlines as examples of businesses that disrupted their markets by coming up with novel value propositions that appealed to consumers. According to Ulaga and Chacour (2001), businesses that concentrated on value proposition innovation had a higher chance of success than those that concentrated on making minor tweaks to already-effective goods. They contend that attracting and keeping clients depends on having a compelling value offer.

Chen and Chen (2010) discovered that the success of online social networking platforms depended heavily on value proposition innovation. According to their argument, successful platforms like Facebook and LinkedIn set themselves apart from their rivals by developing distinctive value propositions that connected with users. Value proposition innovation, according to Foss and Saebi (2017), was one of the major success factors. They contend that profitable companies were able to develop novel value propositions that catered to unmet client demands and upended established businesses. Overall, these empirical studies show how crucial value proposition innovation is to promoting corporate success and expansion. Companies are more likely to prosper and maintain their competitive edge if they can develop distinctive value propositions that appeal to customers.

2.2.3. Value captured

Value capture, which refers to the act of retaining a part of the value generated for clients, shareholders, and other stakeholders, is an important component of corporate strategy. According to Teece (2019), value capture is a major factor in determining competitive advantage, and businesses that are able to retain a sizeable amount of the value they generate have a higher likelihood of achieving long-term profitability and growth. Brodsky and Oakes (2017) discovered that organizations that are successful at capturing value are more likely to exceed their counterparts in terms of growth and profitability. The study involved 1,100 companies. They contend that a successful company strategy must include effective value capture.

Kirsch (2009) showed that value capture was a key element in the success of product development programs in a survey of 50 pharmaceutical companies. They contend

that businesses with the capacity to successfully capture the value generated by their goods have a higher chance of long-term success. Cheah and Wang (2017) discovered that efficient value capture was a major factor in driving innovation success in a study of 80 IT companies. They contend that businesses who can successfully capture the value produced by their innovations have a higher chance of long-term success.

Deloitte (2017) discovered that businesses that are successful at value capture are more likely to have sustained profitability and growth after studying 201 businesses in the US, Europe, and Asia. They contend that in order to effectively capture value, one must have both a plan for capturing a share of the value generated for consumers and other stakeholders. Overall, these empirical studies show how crucial value capture is to promoting economic success and expansion. Long-term profitability and expansion as well as success are more likely for businesses that are good at retaining a share of the value they generate.

2.3. Resilience in SMEs

The profitability and survival of small and medium-sized businesses (SMEs) depend heavily on their ability to be resilient. Due to their limited resources and homogenous client bases, SMEs are frequently more susceptible to external shocks than bigger companies. Empirical research has nonetheless demonstrated that SMEs with high levels of resilience are better equipped to deal with adversity and retain their performance in the face of difficulties.

In one study, Ali and Anwar (2021) looked at the connection between resilience and business success in a sample of 277 Pakistani SMEs. Resilience, according to the researchers, significantly and positively affected both financial and non-financial performance indicators. Particularly, it was discovered that SMEs with higher levels of resilience also had better levels of innovation, customer happiness, and staff engagement, as well as higher levels of profitability and revenue growth.

Another study by Cheah and Wang (2017) looked at the elements that support Chinese SMEs' resilience. The researchers discovered that resilience was positively correlated with traits including strategic adaptability, resourcefulness, and networking skills. The research also revealed that SMEs who were able to develop and maintain solid bonds with their clients, suppliers, and other stakeholders were more resilient than those that were unable to do so.

In their third study, Nistor and Dumitru (2018) looked at how organizational culture might help Romanian SMEs become more resilient. The researchers discovered that SMEs with an innovative, risk-taking, and continuous learning culture were more resilient than those with a more conventional and conservative culture. The study also discovered that SMEs with a culture of open dialogue and cooperation were better equipped to react to outside shocks and adjust to shifting market conditions.

2.4. The role of technology in SMEs

Small and medium-sized businesses (SMEs) are essential to the economies of many nations. Technology has grown in significance for SMEs recently in a number of ways (Ufua et al., 2021a). Technology is the use of scientific knowledge, apparatus, methods, and procedures to design, develop, and enhance goods, services, and systems that improve the quality of life for people (Ibidunni et al., 2021c; Rashid & Ratten, 2021). Debates concerning the place of technology in society and its effects on SMEs have been prompted by the rapid speed of technological progress, which has also produced new opportunities and problems, including ethical, legal, and social ramifications.

Technology may assist SMEs in streamlining their operational processes, automating jobs, and boosting productivity. For instance, SMEs may manage customer data and interactions by deploying Customer Relationship Management (CRM) software, and they can track projects and deadlines by using project management software. According to a research by the European Commission, SMEs that embraced digital technology saw a 10–20% improvement in productivity (European Commission, 2016).

By automating procedures, lowering the demand for manpower, and enhancing supply chain management, technology may assist SMEs in cutting expenses (Olokundun et al., 2022a). For SMEs, for instance, initial capital expenses might be decreased by cloud-based solutions like Software as a Service (SaaS). According to a Deloitte report from 2017, SMEs who utilized digital technology were able to save expenses by up to 50%.

By increasing their reach and enhancing their marketing efforts, technology may assist SMEs in entering new markets. SMEs may use social media platforms and e-commerce websites as an affordable means of reaching a worldwide audience. According to an Accenture research, SMEs who utilized digital technology saw up to a 20% rise in revenue (Accenture, 2016).

By upgrading their goods and services, accelerating their rate of delivery, and boosting client experiences, technology may provide SMEs a competitive edge (Ibidunni et al., 2021c). According to a survey by Harvard Business Review (Business Wire, 2018), SMEs who used digital technology were more likely to outperform their rivals. Technology may help SMEs innovate by enabling them to create new goods and services, enhance their current offers, and embrace fresh business strategies. According to a World Economic Forum research, SMEs that utilized digital technology had greater growth rates and were more likely to be creative (World Economic Forum, 2019).

2.5. Business model innovation, resilience, and technology

Technology, business model innovation, and resilience are interconnected ideas that have received a lot of attention in the context of small and medium-sized businesses (SMEs). SMEs are the backbone of most economies, and

innovation and market adaptation are essential to their survival and expansion. I will examine the connection between SMEs' use of technology, adaptability, and business model innovation in this talk, which is backed by empirical research and rationale.

The performance of SMEs is favourably impacted by business model innovation, according to empirical research. For instance, SMEs that innovated their business models outperformed those that did not in terms of growth rates and financial performance, according to a research by Kagermann et al. (2016). Similar to this, Ritala et al.'s (2014) study revealed that SMEs with a focus on business model innovation outperformed those without it in terms of competitiveness and financial performance.

Resilience is a key element in SMEs' success, according to empirical studies. For instance, a study by Wilden et al. (2019) discovered that more resilient SMEs had a higher propensity for innovative activities and had better performance outcomes. Similar to this, SMEs that employed resilience strategies were better equipped to react to changes in their operational environment and were more likely to stay viable over the long term, according to a research by Rasid and Ratten (2021).

The performance of SMEs is favourably impacted by the implementation of technology (Olokundun et al., 2022a). For instance, SMEs that embraced new technology outperformed those that did not in terms of production levels and competitiveness, according to a research by Aghion et al. (2014). Similar to this, a research by Hussain (2021) revealed that SMEs who used technological solutions outperformed those that did not in terms of innovation and financial success.

Business model innovation, resiliency, and technology adoption by SMEs are intricately connected. Teece (2019) affirmed that SMEs that innovate their business models are better equipped to adjust to shifting market conditions and maintain their competitiveness over time. This increases their adaptability and capacity to handle unforeseen difficulties and possibilities. Similar to this, SMEs with resilience plans in place are better able to deal with shocks and seize opportunities, which improves their capacity for innovation and the adoption of cutting-edge technology.

3. Theoretical justification

The link between Business Model Innovation (BMI), resilience, and technology for Small and Medium Enterprises (SMEs) may be explained by a number of ideas. Three possibilities that are particularly pertinent in this situation were covered by the researchers in their answer.

Resource-Based View (RBV) Theory: The RBV hypothesis states that a firm's skills and resources play a significant role in determining its performance and competitive advantage. BMI, resilience, and technology may be viewed as important resources and competences in the context of SMEs. SMEs may strengthen their capacities and become more competitive by investing in technology and continually improving their business strategies. Resilience may also be viewed as a resource that SMEs can generate through the implementation of risk management techniques, the creation of redundancies, and the diversification of their clientele.

Dynamic Capability Theory: According to the dynamic capability theory, businesses with the flexibility to develop their skills and adapt to shifting circumstances have a higher chance of long-term success. This theory contends that BMI, resilience, and technology are crucial for developing in SMEs the dynamic capacities that allow them to adapt to changes in the market and the environment. This aligns with the submission of Ufua et al. (2021b) that SMEs may build the flexibility and agility needed to respond to new challenges and opportunities by continually reinventing their business models and investing in technology. By offering the essential tools and platforms, technology may help SMEs execute innovative business models. Resilience may also be viewed as a resource that SMEs can create by adding redundant processes, broadening their clientele, and putting risk management plans into place. Small and medium-sized enterprises (SMEs) can build the adaptability and flexibility needed to respond to new opportunities and challenges by investing in technology and continually reinventing their business models. Additionally, it may provide SMEs a competitive edge over their rivals.

Institutional Theory: According to institutional theory, a firm's behavior is influenced by the values, regulations, and norms of its institutional environment. This theory contends that the institutional framework in which SMEs operate can have an impact on BMI, resilience, and technology in the context of SMEs. The incentives and resources that SMEs have access to for making technological investments and developing new business models, for instance, might be impacted by government laws and regulations. The norms and values that impact how SMEs think about taking risks, innovating, and being resilient can also be influenced by the institutional context. The incentives and resources that SMEs have access to for making technological investments and developing new business models, for instance, might be impacted by government laws and regulations. The norms and values that impact how SMEs think about taking risks, innovating, and being resilient can also be influenced by the institutional context. SMEs must thus be cognizant of the institutional framework in which they operate and create strategies that are consistent with the standards, beliefs, and laws of that environment.

The Resource-Based View Theory, Dynamic Capability Theory, and Institutional Theory are all pertinent for comprehending the connection between Business Model Innovation, resilience, and technology for Small and Medium Enterprises, in conclusion. These ideas can help SMEs create plans for enhancing their skills, adjusting to environmental changes, and overcoming institutional obstacles. These theories can offer SMEs a framework for making defensible choices regarding the distribution of

their resources and investments in the skills that will enable them to prosper over the long run.

4. Methodology

A quantitative study strategy was used to examine the connection between business model innovation (BMI), resilience, and technology in Small and Medium Enterprises (SMEs). Data were collected from a cross-section of respondents, including firm owners and business professionals from many companies with different characteristics, using both probability and non-probability sampling approaches. Entrepreneurs and associations were chosen as part of the sample using a combination of convenience and purposive sampling methods.

The study concentrated on business owners who had been in operation for at least five (5) years since they were more likely to have seen a variety of market shifts and be able to offer insightful information about how BMI, resilience, and technology affect SMEs. The participants were chosen on purpose from a sizable pool of managers, owners, and supervisors of SMEs registered with four (4) different agencies.

The total number of participants in the study was 1840, and there were 420 participants in the sample. Because they were the only associations whose members had benefited from expert business assistance and from both local and international agencies, the four associations chosen for the research were chosen. This decision made sure that the research subjects had access to the tools and assistance they needed to put BMI and technology-based initiatives into practice, as well as to develop resilience in the face of market adversities.

The study sought to give a thorough examination of the link between BMI, resilience, and technology in SMEs by using a quantitative approach using both probability and non-probability sampling methodologies. The study findings were indicative of the larger SME community thanks to the sample population and associations that were chosen, and they also offered insights into the elements that contribute to the resilience and success of SMEs.

5. Result and discussion

The study used partial least squares (PLS) methods to test the hypothesis and evaluate the moderating influence of technical capabilities on the link between business model innovation (BMI) and organizations' resilience. Value proposition, value captured, value creation, and learn innovation were utilized as independent constructs for the four BMI indicators, whereas structural, operational, cognitive, and financial resilience were employed as dependent variables for the four dimensions of firm resilience. The moderating variable with five distinct measurement items was the technical capability.

All of the observed variable indicators were rated on a scale of 1 to 5, with 1 denoting "strongly disagreed" and 5 denoting "strongly agreed." To ensure the validity and dependability of the findings, all multivariate assumptions were carefully examined before to the study.

The use of PLS technique allows for a comprehensive statistical examination of the association between BMI, resilience, and technical capacity in SMEs. The study was able to learn how technology may improve the impact of BMI on organizations' resilience by evaluating the moderating influence of technological competence. Figure 1 provides useful information to SMEs looking to put plans in place to increase resilience and compete in the face of market problems.

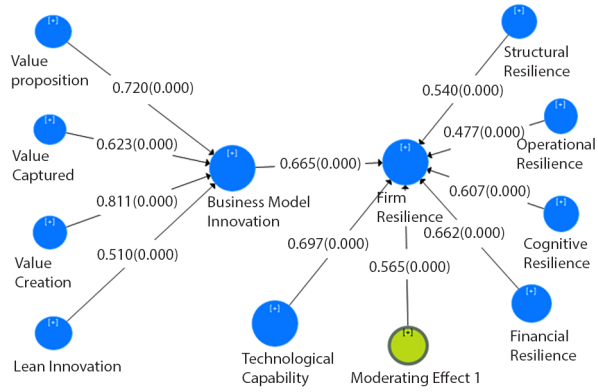

Figure 1. PLS Model for business model innovation, technological capability and resilience of SMEs

In order to understand their findings on the association between business model innovation, technical competence, and company resilience, the researchers in this study utilized a number of statistical metrics. Specifically, they assessed the extent and strength of the correlations between these constructs using path coefficients, t-statistics, R-square values, and p-values.

In structural equation modeling (SEM), path coefficients are frequently employed to calculate the strength and direction of the link between latent variables. The link between the two constructs is stronger the higher the path coefficient. In Figure 1 the degree and intensity of the association between business model innovation, technical prowess, and company resilience were assessed in this study using the path coefficients.

On the other hand, the t-statistic shows the estimated differences as units of standard error. It is a way to gauge how much an observable impact exceeds what would be predicted by chance. The t-statistic was utilized in this work to evaluate the computed path coefficients' statistical significance.

The R-square value is a measure of how much of the diversity in the independent variables –innovative business models and technical prowess – can be accounted for by the dependent variable, or firm resilience. The independent and dependent variables are more strongly related when the R-square value is larger.

The p-value, which is the final measurement, assesses the likelihood that the observed association between the

variables might have arisen by coincidence. Statistical significance is commonly defined as a p-value less than 0.05, which shows that the observed link is unlikely to be the result of chance. Overall, using these statistical measures offers a reliable and organized method for assessing how variables in complicated models relate to one another. These metrics enabled the researchers to pinpoint the important connections among business model innovation, technical advancement, and firm resilience and to assess the degree and direction of these connections as shown in Table 1.

Table 1. Path coefficients for business model innovation, technological capability and firms resilience

Variables	Path Coefficient	Std. Dev.	T Statistics	P Values
Business Model Innovation → Firm's Resilience	0.665	0.036	18.472	0.000
Technological Capability → Firm's Resilience	0.697	0.039	17.872	0.000
Moderating Effect (TC) → Firm's Resilience	0.565	0.041	13.780	0.000

The evidence offered in this argument (Table 1) is consistent with the idea that technology advancement and innovative business models may have a favorable impact on a firm's resilience. The measuring constructs of business model innovation and companies' resilience as well as technical capabilities and firms' resilience were shown to be significantly correlated in the study. The power and significance of these correlations were assessed using the path coefficients, t-statistics, and p-values.

The study also found that the association between innovative business models and businesses' resilience is moderated by technology competence, indicating that by utilizing technological capabilities, innovative business models can have an even greater beneficial influence on a firm's resilience. The technology acceptance concept, which contends that adopting new technology may enhance organizational performance, is supported by this research.

As SMEs frequently deal with budget limitations and technology difficulties, the study's findings have significant significance for them. SMEs may be better positioned to survive upheavals and develop resilience by adopting new business strategies and utilizing technical skills.

Overall, this study offers empirical proof that advances in technology and business model innovation are critical to boosting a firm's resilience. According to the findings, SMEs should give these investments top priority if they want to increase their sustainability and long-term performance.

The study's conclusions show that technical capabilities strengthen the link between business model innovation and organizations' resilience. In other words, technological advancement makes the link between innovative business models and company resilience stronger. This result is in line with the argument made by Lu et al. (2011a, 2011b), who argued that the government's ability to help SMEs spread new technology depends on how it perceives the stage of technological diffusion that is most prevalent among small businesses. Therefore, opinions regarding technological innovation depend on where entrepreneurial enterprises are in their technological innovation process. In order to sustain a rapid pace of innovation and enhance company performance, SMEs must thus seize technology opportunities (Ibidunni et al., 2021a, Ufua et al., 2022a).

The findings of this study also contend that in order for SMEs to maintain a competitive edge in the market, they must always look for high-quality business opportunities and provide better and more cheap goods than their rivals. This result is in line with the argument made by Gao et al. (2021), who claimed that in order to generate value and obtain a competitive edge in the market, SMEs need to adopt a proactive innovation approach. They also said that value development is a result of identifying unmet consumer desires in the market. Small and medium-sized businesses should focus on enhancing product delivery and making sure that customers continue to obtain value for their money.

The study's conclusion highlights the significance of technology in supporting the link between business model innovation and company resilience. To keep up a rapid pace of innovation for better company performance, SMEs must seize technology opportunities. To be competitive in the market, SMEs must also continually look for high-quality business opportunities, provide better and more cheap items than their rivals, and concentrate on enhancing product delivery.

5.1. Discussion on findings

Small and medium-sized businesses (SMEs) must employ internal resources to proactively adapt to fast-paced and competitive conditions, according to Ufua et al. (2022b). According to the study, this ability can show itself as superior technological ability. To assist SMEs in product creation, strategic decision-making, and cooperation, organizations must be able to recognize, put these capabilities into practice, and continually update them. This result is in line with both the innovation diffusion theory and the value capture paradigm, which highlights value capture as a key factor in operational resilience.

According to innovation diffusion theory, SMEs can decide whether or not to adopt innovation models based on the model's perceived value for the industry. This strategy is in line with the practices of today's researchers and practitioners, who have embraced innovation and creativity as a vital tool for addressing new problems in operational processes, ensuring sustainability, and pursuing predetermined goals in a dynamic business environment (Ufua et al., 2021a).

From the perspective of the regulatory emphasis theory, the relationship between the business innovation

model and the businesses' resilience can be compelling (Olokundun et al., 2022b). Through persuasion and incentive, the appropriate decisions made to develop, implement, execute, and regulate the organizational response behavior can achieve this. Achieving structural resilience, operational resilience, cognitive resilience, and financial resilience requires SMEs to have the capability, resources, and potential to do so (Olokundun et al., 2022a).

Utilizing technical capabilities may combine the resilience of businesses with the business innovation model, as suggested by the technology acceptance model. Because technology dissemination affects the adoption of the business model, especially among small organizations, SMEs' decision to use technical capabilities will strengthen the link between business innovation and firm resilience (Ufua et al., 2022b).

In order for SMEs to be innovative and resilient, they must understand the significance of technology capacity. By utilizing technical capabilities, businesses may build the internal skills they need to quickly and effectively respond to competitive conditions, increasing their resilience and positioning them for success in a dynamic business climate.

6. Conclusions

In conclusion, the development and sustainability of small and medium-sized businesses depend significantly on the link between technical capabilities, business model innovation, and firm resilience. Product creation, strategic decision-making, and cooperation may all benefit from technological capacity, which can also be used to combine corporate innovation and firm resilience. The acceptance of innovation models by small businesses depends on how valuable they are deemed to the industry. Companies must also have the ability, resources, and potential to have a significant impact on the development of structural resilience, operational resilience, cognitive resilience, and financial resilience. In order to maintain a competitive edge in the market, SMEs must use internal resources to proactively adapt to fast-paced and competitive situations. They must also consistently look for high-quality business opportunities and provide better and more affordable products than their rivals. They will maintain their market relevance, provide clients with value, and achieve sustainable growth by doing this.

6.1. Recommendations and policy implication

Several recommendations and policy implications may be made based on the findings presented above to help SMEs improve their resilience through technology capabilities and business model innovation.

To start, the government and policymakers should promote the use of technology among SMEs by offering finance, technical support, and training. Collaboration with tech-focused organizations, such universities and research facilities, can help achieve this.

In order to find unmet consumer demands and create new and improved goods and services, SMEs should be encouraged to foster a culture of innovation and creativity. Government officials and policymakers may encourage and assist SMEs in their innovation efforts.

In order to increase their resilience, SMEs require access to resources including funding, qualified labor, and infrastructure. With the help of financial programs and regulatory frameworks, governments may implement policies that facilitate SMEs' access to these resources.

SME collaboration with other businesses, academic institutions, research facilities, and government organizations can help them advance their technological prowess and business model innovation. It is possible to create and implement policies and programs that encourage networking and cooperation among SMEs.

Policies and rules that encourage the expansion and development of SMEs can be created and put into effect. Technology advancement, business model innovation, and innovation in the regulatory environment should all be supported.

The government can develop programs for skills development and capacity building for SMEs to enhance their technological capability and business model innovation. These programs can be designed to address specific skill gaps that are necessary for enhancing SMEs' resilience.

In conclusion, the findings suggest that SMEs' resilience can be enhanced through technological capability and business model innovation. Governments and policymakers can implement policies and programs that support SMEs in developing these capabilities to enhance their resilience and competitiveness in a fast-paced and competitive business environment.

6.2. Contributions to knowledge

The research's findings add to the body of knowledge about the connections between technical advancement, business model innovation, and firm resilience in small and medium-sized companies (SMEs). In particular, the study emphasizes how crucial technical capacity is in fostering the link between business model innovation and organizations' resilience. The study also demonstrates how SMEs may use their internal resources, particularly their technical resources, to proactively respond to fast-paced and competitive situations, enhancing their resilience.

The study also sheds light on the variables that affect SMEs' readiness to adopt novel business practices and technological advancements. The value proposition, value obtained, value generation, and lean innovation are the factors that the research specifically names as having an impact on customers' readiness to adopt new technology and other corporate innovations.

The report also emphasizes the necessity of governments supporting SMEs in terms of technology diffusion. The government's involvement in helping SMEs spread new technologies depends on how it perceives the stage of technological diffusion that is most prevalent among

small businesses. As a result, governments should concentrate on supplying SMEs with the information and tools they need to advance their technical skills, which will enhance the creativity of their business models and the resilience of their organizations.

Overall, this study presents insightful information about how business model innovation, technology competence, and businesses' resilience relate to SMEs. It also makes policymakers recommendations on how to help SMEs become more resilient and technologically advanced.

6.3. Limitations and suggestions for further studies

The fact that this study's sample of SMEs was drawn from a particular area limits the study's capacity to generalize its findings to other situations. Future research might thus examine the connection between technical advancement, business model innovation, and company resilience in different areas and nations.

The study's reliance on self-reported data, which might be biased, is another drawback. As a result, future research could think about triangulating the results by using different sources of data, such interviews and observation.

The study did not look at the elements that affect the growth of technology capabilities in SMEs; instead, it concentrated on how technological skills affect business model innovation and company resilience. Future research should look at the variables that help or hinder the growth of technical skills in SMEs, such as financial availability, human capital, and governmental regulations.

In sum, by underlining the significance of technology skills in enhancing business model innovation and organizations' resilience, this study adds to the body of knowledge on SMEs. The results indicate that SMEs should make technology investments to increase their ability for innovation and market-condition adaptation. The study highlights the need for policies that encourage the development of technology skills in SMEs and offers policymakers insights into the elements that boost SMEs' resilience.

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