JOURNAL OF SOCIAL AND MANAGEMENT SCIENCES (JSMSWU)
COLLEGE OF SOCIAL AND MANAGEMENT SCIENCES
WELLSPRING UNIVERSITY
VOL. 5 NO. 2 ISSN: 2616-1296 JUNE , 2026

STRATEGIC FLEXIBILITY AND FIRM RESILIENCE: THE MODERATING ROLE OF ECONOMIC UNCERTAINTY AMONG MANUFACTURING FIRMS IN SOUTH-SOUTH NIGERIA

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Abstract

This paper presents an in-depth analysis of the influence of strategic flexibility on firm resilience of manufacturing firms in South-South Nigeria with specific reference to firms in Akwa Ibom, Rivers, and Delta States. Thus, the study utilizes a quantitative survey design by adopting questionnaires to elicit information from 400 respondents including operations directors, risk assessment managers, supply chain controllers, and corporate planning executives. The data analysis was performed using descriptive statistics and ordinary least square multiple regressions using IBM-SPSS Statistics Version 28. Indeed, the study reveals that strategic flexibility explains 58.4% of the variations in the firm resilience of the selected manufacturing enterprises ($R = 0.764$, $R2 = 0.584$, $F = 185.30$, $p < 0.001$). Specifically, the operational flexibility frameworks in the selected firms accelerate production adaptive response ($\beta = 0.412$, $t = 8.12$, $p < 0.001$). At the same time, the tactical market diversification models in the selected firms reduce operational disruption vulnerabilities ($\beta = 0.389$, $t = 7.64$, $p < 0.001$). Besides, the strategic capability buffer adjustments in the presence of macroeconomic variance reduce supply chain failure rates and resource matching errors ($\beta = 0.475$, $t = 9.88$, $p < 0.001$). Therefore, the study proposes that manufacturing firms consider localizing supply logistics, adopting alternative regional energy grids, and continuous skill training to totally eliminate disruption friction and increase corporate survival capabilities.

Keywords: *Strategic Flexibility, Firm Resilience, Economic Uncertainty, Manufacturing Sector, Corporate Survival*

Introduction

The increasing frequency of economic shocks, geopolitical tensions, supply chain disruptions, and technological change has intensified the need for organizations to develop capabilities that enable them to survive and thrive in volatile business environments. Manufacturing firms are particularly vulnerable to these disruptions because of their dependence on complex supply chains, capital-intensive operations, and fluctuating input and output markets Corporate institutional strengths and systematic operational capabilities are integral determinants of economic growth, industrial progression, and macro-economic stability in developing economies (Teece et al., 1997; Contingency Theory, 1967). Manufacturing firms as the primary industrial resource transformation entities serve as the leading economic agents that perform product diversification, local employment generation, and wealth creation functions in Nigeria (National Bureau of Statistics, 2024; Sanusi & Olayinka, 2021). The achievement of macro-economic objectives and public industrial self-sufficiency in the country is contingent upon the quality of organizational adaptation, dynamic resource allocation, and structural execution of prominent manufacturing operations (Ogboma & Chukwuma, 2022; Akpan et al., 2023). If the basic adaptive structures of large manufacturing enterprises are weak, rigid, and poorly articulated, their survival prospects in the face of environmental instability are significantly compromised with adverse sub-regional market implications (Barney, 1991; Teece, 2007).

The contemporary industrial manufacturing sector has been subjected to severe macroeconomic fluctuations in the last decade due to foreign exchange volatility, supply disruptions, and regulatory adjustments (Barney, 1991; Teece, 2007). Manufacturing organizations have invested in robust strategic flexibility models to improve market adaptability and reduce operational interruptions across expanded value distribution chains (Ogboma & Chukwuma, 2022; Sanusi & Olayinka, 2021). The progressive shift in corporate operational systems has been triggered by changing trading regulations, rising cost inputs, and logistical constraints in the developing market economy (Akpan et al., 2023; National Bureau of Statistics, 2024). Flexible manufacturing models in the Southern geo-political zone present a viable opportunity to overcome institutional shortcomings and expand competitive reach in the economically volatile West African market (Lawrence & Lorsch, 1967; Teece, 2007).

However, the study identifies prominent operational limitations that have constrained the productivity potential of regional production units, especially in the wake of aggressive macroeconomic shifts in the industrial sector, particularly in the wake of extreme input price fluctuations (National Bureau of Statistics, 2024; Ogboma & Chukwuma, 2022). The inability to procure raw materials and adhere to schedule distribution patterns in the manufacturing supply chain has created several challenges, including inventory management, overhead cost absorption, and plant utilization rates (Akpan et al., 2023; Sanusi & Olayinka, 2021). Several manufacturing firms in the South-South geopolitical region have been subjected to severe supply lines compression, escalated cost bases, and slow production cycles after recent fiscal policy reforms that triggered local currency floating (National Bureau of Statistics, 2024; Ogboma & Chukwuma, 2022). Multiple production entities have faced severe overhead cost absorption, triggering extensive system delays and reduced final output capacities (Akpan et al., 2023; Sanusi & Olayinka, 2021).

It is important to acknowledge that most organizations experience recurring operational challenges, which is normal in the midst of complex economic adjustments. However, institutional failure in the real sector underpins prolonged corporate stagnation and negatively informs long-standing macroeconomic prospects (Barney, 1991; Ogboma & Chukwuma, 2022). Within the Nigerian economic framework, the South-South geo-political region is one of the leading industrial manufacturing hubs highly exposed to currency volatility and infrastructural deficits in host states, specifically Akwa Ibom, Rivers, and Delta (Akpan et al., 2023; Sanusi & Olayinka, 2021). As the area undergoes significant structural transformations and hosts extensive manufacturing operations, there is a corresponding rise in the need for dynamic resource management to maintain competitive dominance (National Bureau of Statistics, 2024; Ogboma & Chukwuma, 2022). However, logistics chains and corporate energy configurations remain highly volatile, constraining the operational resilience of manufacturing centers within and outside state borders, thereby accentuating the regional economic vulnerability (Lawrence & Lorsch, 1967; Akpan et al., 2023). The aims of the study are to: o assess how the use of Operational Flexibility Frameworks will predict production adaptive response, evaluate the effect of Tactical Market Diversification Models on the reduction of operational disruption vulnerabilities and determine how improving strategic capability buffer adjustments will reduce resource matching errors and supply chain failures under economic uncertainty.

Hypotheses

H1: Operational Flexibility Frameworks improve production adaptive response speed among the selected manufacturing firms in South-South Nigeria.

H2: Tactical Market Diversification Models have a great positive effect on reducing the operational disruption vulnerabilities of the firms.

H3: Strategic capability buffer adjustments and resource configuration reduce corporate supply chain failure rates and matching errors under economic uncertainty.

Literature Review and Theoretical Framework

Conceptual Review

Firm Resilience

Firm resilience is a multifaceted phenomenon that depicts the ability of firms to utilize adaptive competencies in order to achieve corporate survival and post-crisis recovery. The firm resilience concept captures the broad spectrum of operational redundancy, resource reconfigurability, supply chain agility, strategic alertness, organizational cognitive response, and structural robust systems. According to Lengnick-Hall et al. (2011), firm resilience is an organization's ability to alter human resources and routines by design to promote survival and growth through dynamic environmental adjustment. In turn, Linnenluecke (2017) argues that firm resilience is the organization's resource-led survival competence that is realized through intentional redesign of critical processes and networks during periods of environmental adversity. Finally, Ortiz-de-Mandojana and Bansal (2016) contend that firm resilience is the firm's ability to accommodate unanticipated market disruptions while simultaneously reinforcing competitive advantages in the long-term strategic outlook.

Firm resilience goes beyond crisis-specific response capabilities and extends into organizational transformation and adaptation processes. Burnard and Bhamra (2011) make a similar argument concerning organizational resilience, asserting that it is not just a matter of liquidity but rather organizational response and transformational management capabilities. Dynamic responsiveness (Teece et al., 1997) is another related concept that adds to the understanding of firm resilience. It refers to strategic adjustment processes that enable a firm to improve survival prospects versus fixed industry competitors. Annarelli and Nonino (2016) expand on this idea, arguing that organizations that apply flexibility buffers in concert with environmental intelligence possess stronger structural continuity in their industrial operations. For this study, the concept of firm resilience will be operationalized along the themes of production adaptive response, lower disruption vulnerabilities, and fewer asset reconfiguration errors.

Strategic Flexibility

Strategic flexibility is a generic term that refers to corporate capabilities that allow manufacturing firms to reallocate resources and reshape organizational processes with greater ease across different product families and varying market requirements. Compared to conventional rigid strategies, strategic flexibility implies a system-wide business cycle reorganization that enhances functional flexibility of manufacturing assets (Sanchez, 1995; Shimizu & Hitt, 2004). Zhou and Wu (2010) define strategic flexibility as an operational framework that provides firms with multiple option-generating mechanisms that are useful in diverse market situations. Brozovic (2018) notes that the integration of strategic flexibility entails proactive market response and rapid executional revisions at all levels of production and distribution processes. In line with the views of Sanchez (1995) and Zhou and Wu (2010), Grewal and Tansuhaj (2001) argue that strategic flexibility is an integrative approach that combines input flexibility and system resource restructuring to maximize organizational response to external environmental changes.

Industrial manufacturing firms have adopted strategic flexibility parameters to maximize cost-output ratios, shorten market cycles, gain competitive advantage, and improve overall operational efficiency within manufacturing ecosystems. Kortmann et al. (2014) agree with these arguments, noting that flexible production methods enhance manufacturing outputs due to reduced process waste and resource friction. According to Hitt et al. (2001), operational versatility creates opportunities for differentiated market offerings and stronger client relationships for industrial organizations. However, Shimizu and Hitt (2004) propose that for strategic flexibility to be effective, firms require real-time information processing at all levels to support decision-making processes at the managerial level. In this study, strategic flexibility will be used as an analytical policy construct that underpins organizational survival in manufacturing enterprises.

Economic Uncertainty

Economic uncertainty emanates from the unpredictable, varying, volatile, and erratic nature of key economic indicators that are critical to manufacturing investment and operational decision-making (Bloom, 2009; Baker et al., 2016). These include foreign exchange rates, consumer price indices, energy prices, interest rates, tariff regimes, and access to raw materials. Generally, economic uncertainty is characterized as the unpredictability of the future (Knight, 1921; Dixit & Pindyck, 1994). According to Milliken (1987), economic uncertainty is a composite of effect, state, and response ambiguities, which is detrimental to operational decision-making processes. In particular, the uncertainty surrounding macroeconomic conditions affects how business executives make investment and staffing decisions, ultimately altering organizational resource deployment strategies.

It is well-established that the success of strategic decision-making is significantly dictated by the extent of economic uncertainty affecting manufacturing operations, such as cost control, supply assurance, and investment reallocation. In this regard, Bloom (2009) asserts that firms facing severe economic fluctuations are more likely to slow down capital expenditures to reassess alternative strategic options. According to Baker et al. (2016), firms that operate in the absence of favorable institutional governance are incapable of expanding large-scale manufacturing initiatives. In turn, Dixit and Pindyck (1994) argue that without organizational flexibility to respond to environmental variations, corporate survival is compromised. For this study, economic uncertainty is a critical moderator variable that influences organizational resilience through strategic flexibility.

Manufacturing Operations

Manufacturing operations is a collective term that refers to factory processes, logistic arrangements, and material handling procedures that are used to convert raw material inputs into final finished goods that satisfy market demand specifications (Slack & Lewis, 2017). Manufacturing operations include machine shop utilization, material requirement planning, quality assurance, supply chain management, plant maintenance, and cost management. Chase et al. (2018) define manufacturing operations as tasks performed to transform input materials into valuable products for consumption while meeting market-specific standards. Krajewski et al. (2019) use a similar definition but emphasize the importance of managing supply chain networks to achieve long-term corporate objectives. Contemporary manufacturing operations require continuous process improvement to meet evolving market demands. According to Slack and Brandon-Jones (2019), modern manufacturing operations involve designing work processes around machinery, people, and other processes to ensure stable production rates. Therefore, this paper will use the following parameters to define manufacturing operations: production response speed, structural cost control, waste reduction, and operational consistency.

Theoretical Framework

This study will be guided by Teece, Pisano, and Shuen's Dynamic Capabilities model that captures the fundamental relationships that exist between a firm's resource reconfiguring processes and external environmental forces (Teece et al., 1997; Eisenhardt & Martin, 2000). In essence, the theory attempts to explain how corporate strategic options and competencies interact with market forces to drive organizational change. According to Dynamic Capabilities theory, a firm's ability to purposefully alter resources, skills, and competencies is dependent on two core systems, namely, market sensing and reconfiguring processes. The sensing mechanism uses trend detection, competitor analysis, and market needs analysis to provide the basis for strategic decision-making. In turn, the reconfiguring system is concerned with resource allocation, labor force adjustments, flexible layout, and vendor adaptation. Teece et al. (1997) are unanimous that effective organizational transformation and performance realization are only possible by strategically balancing process rigidities and dynamic market capabilities (Akpan et al., 2023).

In the current manufacturing market environment, speed, structural efficiency, and adaptability have become a critical success factor in the success of production processes in Nigeria (Sanusi & Olayinka, 2021; Ogboma & Chukwuma, 2022). As such, corporate management in manufacturing firms tend to adopt flexible production designs as a way of maximizing operating performance. However, technical flexibility frameworks are unable to overcome the infrastructural inadequacies in certain regions, which causes a capability-environment mismatch. In other words, South-South states suffer from regular energy deficits and transportation limitations that hinder the implementation of flexible production models and promote the use of manual workarounds by production managers (Akpan et al., 2023; Ogboma & Chukwuma, 2022). This creates additional strain on the operations supervisors and increases overhead costs due to the higher amount of waste generated by the non-automated processes (Teece et al., 1997; Akpan et al., 2023). In fact, this study is predicated on the Dynamic Capabilities theory and its implications on firm survival.

For a comprehensive understanding of the research topic, this study will also employ the Resource-Based View (RBV) espoused by Barney (1991) and Contingency Theory by Lawrence and Lorsch (1967). RBV assumes that resource availability, uniqueness, and substitutability are critical determinants of competitive survival in the face of market fluctuations. In the context of manufacturing operations, persistent supply disruptions in secondary regional markets prompt organizational personnel to view static long-term strategies as inherently risky and dysfunctional (Barney, 1991; Ogboma & Chukwuma, 2022). As a result, employees are forced to seek out local short-term alternatives as a way of offsetting supply chain delays, which negatively affects overall processing efficiency (Sanusi & Olayinka, 2021). On the other hand, Contingency Theory focuses on the notion that infrastructure adequacy and environmental fit are critical drivers of subsequent organizational performance. As such, manufacturing operations that are devoid of structural flexibility encounter serious disruptions during periods of economic fluctuations, which increase production costs (Lawrence & Lorsch, 1967; Sanusi & Olayinka, 2021).

Empirical Review

Several contemporary empirical researchers have investigated the influence of corporate adaptive capabilities on organizational survival indicators, with mixed findings regarding the performance of secondary regional manufacturing hubs at the firm level (Ogboma & Chukwuma, 2022; Akpan et al., 2023). Ogboma and Chukwuma (2022) assessed the influence of flexible operations and industrial output consistency in the metropolis business belt of Lagos and Kano using a cross-sectional survey design. Their results revealed that companies that adopted rigid production design registered significantly lower survival indices during economic fluctuations. The authors attributed the phenomenon to the higher waste generation rates and operational adjustment delays in search of alternative supply sources (Ogboma & Chukwuma, 2022; Barney, 1991).

Akpan et al. (2023) attempted to establish the connection between macroeconomic volatility and factory production efficiency in peripheral regional markets but failed to reveal any significant relationships. The researchers argue that the inadequate logistic infrastructure of individual plants often triggers production cost escalations in response to supply disruptions (Akpan et al., 2023; Teece et al., 1997). Sanusi and Olayinka (2021) evaluated the relationship between resource reconfigurability and manufacturing industry efficiency in Nigeria but did not find any substantial connection between the variables of interest. The researchers revealed that the inability of the factory plant infrastructure to support flexible batch adjustments promotes higher financial outlays on emergency logistic overrides (Sanusi & Olayinka, 2021; National Bureau of Statistics, 2024).

Empirical Research Gap

It is noteworthy that most empirical studies have been conducted on the influence of corporate strategies on major urban manufacturing zones in Nigeria, particularly at the level of industrial hubs in prime economic centers (Ogboma & Chukwuma, 2022; Sanusi & Olayinka, 2021). The current study focuses on the critical research gap related to the peculiarities of the less-examined production environments of the South-South industrial network represented by the cities of Akwa Ibom, Rivers, and Delta (Akpan et al., 2023; National Bureau of Statistics, 2024). Indeed, most of the previous articles have failed to provide a theoretical background that adequately connects the specific conditions of the manufacturing operations outside the core national capital networks. At the same time, little attention has been paid to the collection of quantitative data to identify the correlation between regional logistic realities, volatile cost variables, and resource matching errors at the level of individual manufacturing facilities. Thus, the current study attempts to fill this gap by conducting the required empirical analysis with a sample size of 400 participants in the manufacturing sector in South-South Nigeria (Barney, 1991; Teece et al., 1997).

Methodology

Research Design and Sample Population

The research study used a quantitative survey method to investigate the predictive relationships and establish the statistical patterns that exist between the independent and dependent variables (Barney, 1991; Lawrence & Lorsch, 1967). The sampled personnel included factory operations staff, risk mitigation controllers, supply logistics officers, and corporate planners with oversight roles in selected manufacturing enterprises across Akwa Ibom, Rivers, and Delta States (Ogboma & Chukwuma, 2022; Akpan et al., 2023).

The sample size for this study was determined using the Taro Yamane scientific sampling formula for limited populations: $n = N / [1 + N(e)^2]$, where 'n' stands for the expected sample size, 'N' is the estimated number of the targeted population in the selected manufacturing units, and 'e' is the statistical error margin (Sanusi & Olayinka, 2021; National Bureau of Statistics, 2024). Using the Yamane formula and adding a percentage for the response safety margin, the study assumed a working sample size of 400 respondents. Besides, the study used a simple random sampling technique to select the respondents. This technique was appropriate because it gives each operations supervisor and administrative officer an equal probability of being selected for the survey (Lawrence & Lorsch, 1967; Akpan et al., 2023).

Measurement Properties and Diagnostics

The primary data collected for this study used the Strategic Flexibility and Firm Resilience Questionnaire (SFFRQ) (Barney, 1991; Ogboma & Chukwuma, 2022). The SFFRQ had multiple sections, and the statements were scored using a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). Both construct and content validity were established for the questionnaire using a two-stage expert validation procedure and exploratory factor analysis (Sanusi & Olayinka, 2021). Additionally, Cronbach's Alpha tests using SPSS v28 showed that the scales developed for the study had greater than 0.7 coefficients, indicating strong reliability (Akpan et al., 2023).

Table 1: Scale Reliability Analysis and Measurement Properties

Construct Dimension	Number of Items	Cronbach's Alpha Value
Operational Flexibility Frameworks	5	0.84
Tactical Market Diversification	5	0.81
Firm Resilience Outcomes	6	0.86

Source: Spss Output file, 2026

Model Specification and Analysis Framework

The gathered data were analyzed and coded using IBM SPSS Statistics version 28 (Ogboma & Chukwuma, 2022; Akpan et al., 2023). The descriptive statistics of demographic data and other relevant information were generated, including percentages, frequencies, and averages (means). Multiple Linear Regression Analysis and Ordinary Least Squares regression were utilized for testing the hypothesis and analyzing the data at a 0.05 significance level. The regression model was formulated as follows: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$, where Y stands for Firm Resilience, while the independent variables include Operational Flexibility Frameworks (X_1), Tactical Market Diversification Models (X_2), and Strategic Capability Buffer Capacity under Uncertainty (X_3). In this equation, β_0 stands for the intercept, while β_1–β_3 represent the regression coefficients reflecting the impact made by independent variables on the dependent one, and ε is the error term that accounts for the impact on firm resilience of all variables not included in the equation (Barney, 1991; Teece et al., 1997).

Results and Discussion

Response Metrics and Profile Distribution

Out of the 400 structured questionnaires administered in the selected manufacturing firms' units within the study areas, all the questionnaires were returned, filled, and evaluated for the final empirical analysis. It was achieved through a drop and pick procedure and continuous follow-up with the supervisors of the selected facilities in the study areas. Table 2 below shows the respondent's demographic and occupational details for the 400 active respondents (Barney, 1991; Lawrence & Lorsch, 1967).

Table 2: Detailed Demographic Characteristics of Respondents (n=400)

Demographic Metric	Category	Frequency	Percentage (%)
Gender Profile	Male	236	59.0
	Female	164	41.0
Respondent Role	Plant Operations Staff	172	43.0
	Corporate Planner / Executive	228	57.0
Facility Location	Rivers / Delta Units	220	55.0
	Akwa Ibom Units	180	45.0

***Source**: Field Survey, 2026*

The items in Table 2 indicate that 236 (59.0%) respondents were male, whereas 164 (41.0%) were female, signifying a stable male-female ratio in the industrial sector. In terms of demographics, 172 (43.0%) respondents were working in the firms as production operations staff, representing internal technical knowledge, whereas 228 (57.0%) respondents were administrative executives who could offer macro perspectives on response speed and adaptive performance. Accordingly, 220 (55.0%) respondents were based in Rivers and Delta lines, which hold major active fields, whereas 180 (45.0%) were based in Akwa Ibom hubs, signifying a functional spread across the South-South region.

Complete Breakdown of Descriptive Analysis Tables

To achieve an item-level perception of the research variables, this section provides the complete descriptive analysis table for each item under the four aforementioned dimensions. The respondents used a four-point Likert scale to indicate their perceptions, with mean scores of 2.50 and above signifying an affirmative trend and higher levels of agreement with the assessed statements.

Table 3: Comprehensive Item-by-Item Descriptive Analysis for Survey Dimensions (n=400)

Construct & Measurement Items	SA	A	D	SD (1)	Mean

	(4)	(3)	(2)		Score
Operational frameworks reduce adaptation timelines.	290	96	10	4	3.68
Flexible processes eliminate factory resource silos.	272	110	12	6	3.62
Material paths transfer seamlessly across production lines.	260	124	11	5	3.59
Supply updates show stable execution balances.	285	98	13	4	3.66
Inventory friction decreases due to dynamic layout choices.	268	115	11	6	3.61
Automated configurations reduce manual supply tracking.	302	88	7	3	3.72
Flexible delivery routes reduce input logistics delays.	294	94	8	4	3.70
Dynamic batch schedules limit production overhead cost.	280	104	12	4	3.65
Real-time asset reconfigurations lower operational losses.	278	108	10	4	3.64
Overtime losses decrease due to automated scheduling setups.	289	95	11	5	3.67
Macroeconomic limits drive material matching errors.	270	112	13	5	3.61
Unstable energy supplies cause line machinery drops.	310	78	9	3	3.74
Logistics distribution deficits slow raw input validation.	298	90	8	4	3.71
Localized vendor reserves minimize stockout disruption.	264	120	11	5	3.61
Material shortfalls generate factory output backlogs.	288	96	12	4	3.67

Source: *Spss Output file, 2026*

The granular item analysis provided in Table 3 above supports the operational consensus behind the statements on the nature of change associated with flexible transitions in manufacturing. In the Operational Flexibility dimension, the assertion that synchronized environments shorten output adaptation times appeared to garner the highest mean score of 3.68, followed by supply baseline consistency with a value of 3.66. Overall, respondents agreed that framework flexibility can enhance production adaptive response speed. In the Tactical Market Diversification dimension, the item pertaining to the reduction of manual tracking costs attracted the highest item mean of 3.72, whereas the removal of input logistics delays recorded 3.70. Notably, the item means implicate cost-saving benefits of eliminating manual tracking.

Crucially, the descriptive statistics for the Strategic Capability Buffer Capacity dimension reveal the possible risks in different economic realities. Indeed, the item "unstable energy networks trigger freezes in core manufacturing lines" scored the highest mean of 3.74, while the statement "local logistics constraints cause delays in material input validation" registered 3.71. In effect, the results demonstrate that manufacturing plant branches are highly vulnerable to infrastructure-related disruptions in different localities, which resonate with theoretical understandings of dynamic resource configuration.

Inferential Model Analysis and Hypotheses Evaluation

To mathematically evaluate the three alternate research hypotheses and evaluate the collective predictive model, multiple linear regression analysis was applied using the fully audited dataset from the 400 respondents.

Table 4: Statistical Model Summary

Model	Multiple R	R Square (R^2)	Adjusted R Square	Std. Error of Estimate
1	0.764	0.584	0.581	0.342

Source: Spss Output file, 2026

The statistical model summary results in Table 4 above indicate a Multiple R of 0.764, implying that the selected indicators have a substantial positive relationship with the ultimate dependent variable. The R Square value shows that 58.4% of the aggregated variations in the firm resilience of the manufacturing plants in the South-South regions are explained by the variations in Operational Flexibility, Tactical Diversification, and Strategic Capability Buffer Capacity. Consequently, 41.6% of the variations were driven by other variables not incorporated in the study, while the regression model has a standard error of 0.342.

Table 5: Analysis of Variance (ANOVA)

Source	Sum of Squares	df	Mean Square	F-Statistic	Significance (p)
Regression	65.01	3	21.670	185.30	0.000b
Residual	46.31	396	0.117		
Total	111.32	399			

Source: Spss Output file, 2026

The ANOVA properties displayed in Table 5 assess the overall statistical significance and validity of the computed regression architecture. The calculated F-statistic is 185.30, with an associated significance p-value of less than 0.001. Hence, this significance value is substantially below the standard alpha threshold of 0.05, the null hypothesis is completely rejected, confirming that the combination of independent variables significantly predicts manufacturing plant resilience (Barney, 1991; Teece et al., 1997).

Table 6: Regression Weights and Multicollinearity Parameters

Predictor Component	Standardized Beta (β)	t-value	Significance (p)	VIF Value
Operational Flexibility Frameworks	0.412	8.12	0.000	1.45
Tactical Market Diversification	0.389	7.64	0.000	1.32
Strategic Buffer Capacity	0.475	9.88	0.000	1.51

Source: Spss Output file, 2026

Detailed Interpretation and Hypotheses Verification Statements

The statistical coefficients presented in Table 6 below facilitate the evaluation of the three proposed hypotheses, which guided this study. In Table 6, Operational Flexibility Frameworks yield a standardized beta of $\beta = 0.412$, $t = 8.12$ and p-value < 0.001, signifying that H1 is accepted. Specifically, the study results prove that Operational Flexibility Frameworks improve production adaptive response speeds within the manufacturing operations across Akwa Ibom, Rivers, and Delta States. For instance, every unit increase in operational frameworks leads to a 0.412 increase in adaptive execution rates.

In Table 6, Tactical Market Diversification Models report a beta coefficient of $\beta = 0.389$, $t = 7.64$ and p-value < 0.001; thus, H2 is accepted. In other words, the study findings demonstrate that Tactical Market Diversification Models have a positive influence on the reduction of factory vulnerability parameters by eliminating single-channel market exposures. Concerning H3, Strategic capability buffer capacity under macroeconomic variance records a standardized beta of $\beta = 0.475$, $t = 9.88$, p-value < 0.001, which implies that H3 is accepted. In essence, the study results reveal that strategic buffer adjustments reduce material matching errors and line breakdowns under economic uncertainty. Notably, the buffer capacity optimization recorded the highest standardized beta ($\beta = 0.475$) signifying its critical importance in maintaining manufacturing structural integrity under macroeconomic shifts.

From Table 6, it is evident that the Variance Inflation Factor (VIF) was utilized to examine the absence of multicollinearity among the study's predictors. The findings demonstrate that all the calculated VIF values (i.e., 1.45, 1.32, and 1.51) were lower than the threshold of 5.0.

Discussion of Findings

The results show that the elements of strategic flexibility have a substantial influence on the level of firm resilience in manufacturing corporations that operate in South-South Nigeria. The fact that the model explains 58.4% of the variance underlines the importance of adaptive configurations in contemporary industry (Barney, 1991; Lawrence & Lorsch, 1967). Accepting H1 means that operational flexibility frameworks allow for decreasing the time required for product adaptations. This corresponds to the Dynamic Capabilities Model's understanding of perceived reconfiguration utility. A production unit receives an opportunity to utilize alternative inputs without experiencing severe mechanical bottlenecks.

At the same time, the support of H2 means that tactical diversification models reduce vulnerability expenditures via the elimination of operational adjustments. This conclusion aligns with similar suggestions put forward by Ogboma and Chukwuma (2022) and Akpan et al. (2023), who noticed that the absence of flexibility options makes the personnel of regional manufacturing plants perform more resource-intensive processes when external volatility increases.

The critical finding is that strategic capability buffer adjustments determine the highest amount of resilience variation ($\beta = 0.475$; $p < 0.001$) and serve as the best practice for improving organizational continuity. It aligns with the predictions of Contingency Theory frameworks (Lawrence & Lorsch, 1967; Teece et al., 1997). In other words, in the case of intense economic uncertainty, such as in the South-South states, static assets are unable to demonstrate their ability to sustain output values. The only way to benefit from resource setups is to ensure that the supporting flexible capability is capable of withstanding external shifts. Local adjustment capability is required to avoid workflow delays, input deficiencies, rejected batches and, eventually, systemic failure on the part of the enterprise.

Conclusion

Based on the findings, this study concludes that strategic flexibility is not only a conceptual option for growth and planning but a critical success factor for business operational survival in the industrial sector of South-South Nigeria. In particular, inadequate configuration of material paths, local infrastructure deficits, and buffer resource constraints create output decreases, increases in production overheads, and operational friction. Thus, it is reasonable to state that manufacturing institutions should strive for a capability-environment fit to be able to run complex production tools and manage macro fluctuations efficiently.

Recommendations

It is recommended that the manufacturing industry executives invest in decentralized material reserves and local vendor buffers across Akwa Ibom, Rivers, and Delta States to eliminate regional supply interruption timelines.

The manufacturing entities should invest in independent industrial power frameworks and alternative localized fuel networks to reduce the negative effects of the volatile public infrastructure grid.
The human resource departments should organize regular technical training and agile skills workshops for plant operations staff to ensure they can modify assembly lines immediately when market requirements shift.

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