SUPPLY CHAIN MANAGEMENT AND BUSINESS SUSTAINABILITY AMONG SMES IN NIGERIA

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Abstract
The persistent sustainability challenges facing small and medium enterprises in Nigeria have continued to threaten their operational continuity, competitiveness, and long term contribution to economic development. This study examined the effect of supplier relationship management, internal supply chain integration, and customer relationship and information integration on business sustainability among SMEs in Nigeria. A cross sectional survey research design was adopted, and the population comprised 41 million SMEs in Nigeria based on the SMEDAN and National Bureau of Statistics MSME Survey Report (2021). Using Yamane's formula, a sample size of 400 respondents was determined and distributed across the six geopolitical zones through online platforms. Data were collected using a structured questionnaire and analyzed using descriptive statistics, Pearson correlation, diagnostic tests, and multiple regression analysis with the aid of SPSS version 26. The findings revealed that supplier relationship management had a significant positive effect on business sustainability, internal supply chain integration exerted a significant positive influence on business sustainability, and customer relationship and information integration had the strongest significant positive effect on business sustainability among SMEs in Nigeria. The study concluded that effective supply chain management practices are critical drivers of sustainable business performance in the Nigerian SME sector. The study recommended that SME owners and managers should strengthen collaborative supplier partnerships, improve coordination among internal business functions, and invest in customer information and relationship management systems to enhance operational efficiency, customer satisfaction, competitiveness, and long term business sustainability.

Keywords: Business sustainability, customer relationship and information integration, internal supply chain integration, SMEs, supplier relationship management, supply chain management.

1.0 Introduction

Business sustainability has become a major concern for organizations worldwide because firms are expected to achieve economic growth while maintaining social responsibility and environmental efficiency. Sustainable businesses are more capable of adapting to market disruptions, reducing operational waste, and maintaining long term competitiveness. Recent studies show that effective supply chain management plays an important role in achieving these outcomes by improving coordination among suppliers, internal operations, and customers

(Kumar et al., 2023; Khan et al., 2023). Globally, organizations increasingly rely on integrated supply chain practices to enhance efficiency, resilience, and sustainable performance in response to rising customer expectations and competitive pressures.

Small and medium enterprises are particularly important in this discussion because they contribute significantly to employment creation, innovation, and economic development in developed and developing economies. However, SMEs often face challenges such as limited financial resources, weak managerial capabilities, and inefficient operational systems, which threaten their sustainability and survival (Agyabeng Mensah et al., 2021). Supply chain management dimensions such as supplier relationship management, internal supply chain integration, and customer relationship and information integration have been identified as strategic mechanisms that can improve resource utilization, operational coordination, and customer satisfaction, thereby strengthening business sustainability.

In emerging economies, especially within Africa, SMEs operate in environments characterized by infrastructure deficiencies, unstable supply networks, and high transaction costs. These conditions make efficient supply chain management essential for maintaining productivity and competitiveness. Empirical evidence suggests that firms that establish strong supplier partnerships, integrate internal business processes, and utilize customer information effectively are better positioned to achieve sustainable growth and operational resilience (Moktadir et al., 2021; Kumar et al., 2023). Nevertheless, the adoption of these practices have been inconsistent among many African SMEs, which limits their ability to compete effectively in increasingly dynamic markets.

In Nigeria, SMEs constitute an important component of the national economy, contributing substantially to employment generation, income creation, and industrial development. Despite this importance, many Nigerian SMEs experience high failure rates and struggle to maintain sustainable business performance as result of unreliable supplier relationships, fragmented internal operations, inadequate information systems, and poor customer management practices. These operational weaknesses often result in increased costs, delayed production, reduced customer loyalty, and limited long term growth opportunities (Khan et al., 2023). Therefore, understanding how specific supply chain management dimensions influence business sustainability has become an important research and policy issue in Nigeria.

Although previous studies have examined supply chain management and organizational performance, empirical evidence linking supplier relationship management, internal supply chain integration, and customer relationship and information integration directly to business sustainability among Nigerian SMEs are limited and fragmented. Many existing studies focus on large firms or other national contexts, making it difficult to generalize their findings to the unique operational realities of Nigerian SMEs. This gap creates uncertainty regarding the extent to which these supply chain dimensions can enhance sustainable business outcomes within the Nigerian business environment.

The problem addressed in this study therefore stems from the persistent sustainability challenges facing SMEs in Nigeria and the insufficient empirical understanding of how strategic supply chain management practices can address these challenges. Many SMEs continue to operate with weak supplier collaboration, poor internal coordination, and inadequate customer information management, leading to inefficient operations and increased risk of business failure. This study seeks to examine the effect of supplier relationship management, internal supply chain

integration, and customer relationship and information integration on business sustainability among SMEs in Nigeria. Against this backdrop, the study tests the following hypothesis:

H_{01}: Supplier relationship management has no significant effect on business sustainability among SMEs in Nigeria.
H_{02}: Internal supply chain integration has no significant effect on business sustainability among SMEs in Nigeria.
H_{03}: Customer relationship and information integration has no significant effect on business sustainability among SMEs in Nigeria.

2.0 Literature Review

Business sustainability is increasingly viewed as an organization's capacity to achieve continuous economic performance while maintaining social responsibility and environmental stewardship. Recent scholars describe it as the integration of profitability, resource efficiency, stakeholder welfare, and long term organizational resilience into business operations (Agyabeng Mensah et al., 2021; Khan et al., 2023). Studies by Kumar et al. (2023), Moktadir et al. (2021), Centobelli et al. (2021), Yadegaridehkordi et al. (2022), Bag et al. (2021), Paul et al. (2021), Huo et al. (2022), and Ahmed et al. (2022) emphasize that sustainable firms balance financial growth with environmental protection and social value creation. Other researchers, including Ali et al. (2023), Singh et al. (2022), and Zhang et al. (2024), argue that business sustainability also involves adaptability, innovation, and responsible resource management that enable firms to survive in turbulent markets. This study conceptualizes business sustainability as the ability of SMEs to maintain long term economic viability, operational efficiency, customer satisfaction, and responsible social and environmental practices through effective management of organizational resources and relationships.

Concept of Supplier Relationship Management

Supplier relationship management refers to the strategic process through which firms establish, coordinate, and maintain collaborative relationships with suppliers in order to improve operational performance and long term competitiveness. Scholars such as Li et al. (2021), Agyabeng Mensah et al. (2022), Kumar et al. (2024), Moktadir et al. (2022), and Khan et al. (2023) emphasize that effective supplier relationships involve trust, information sharing, joint planning, and long term partnership orientation. Other studies by Huo et al. (2021), Paul et al. (2022), Singh et al. (2023), Ahmed et al. (2022), and Zhang et al. (2024) show that close supplier collaboration improves product quality, delivery reliability, cost efficiency, and organizational responsiveness. Researchers further argue that strategic supplier partnerships contribute to sustainable procurement, innovation, and resilience in supply chains, particularly among SMEs operating in uncertain environments (Ali et al., 2023; Yadegaridehkordi et al., 2022; Bag et al., 2021). Based on these views, this study conceptualizes supplier relationship management as the extent to which SMEs develop collaborative, trust based, and information driven partnerships with suppliers to enhance operational efficiency, reliability of inputs, and sustainable business performance.

Concept of Internal Supply Chain Integration

Internal supply chain integration is commonly understood as the degree of coordination and collaboration among different functional units within an organization to ensure efficient management of materials, information, and operational processes. Recent studies by Flynn et al. (2021), Huo et al. (2022), Khan et al. (2024), Kumar et al. (2023), and Paul et al. (2021) indicate that integration among purchasing, production, inventory, logistics, and distribution functions

enhances organizational efficiency and reduces operational waste. Additional evidence from Agyabeng Mensah et al. (2022), Moktadir et al. (2023), Ahmed et al. (2023), Singh et al. (2022), and Ali et al. (2024) demonstrates that internally integrated firms achieve better communication, faster decision making, improved resource utilization, and stronger sustainability performance. Scholars further maintain that cross functional teamwork and synchronized planning enable SMEs to respond more effectively to market changes and operational disruptions (Zhang et al., 2024; Bag et al., 2022; Yadegaridehkordi et al., 2023). Therefore, this study conceptualizes internal supply chain integration as the extent to which SMEs coordinate and synchronize internal business functions, information flows, and operational activities to improve efficiency, responsiveness, and sustainable business outcomes.

Concept of Customer Relationship and Information Integration

Customer relationship and information integration refers to the systematic coordination of customer interactions, feedback, and information flows to improve service delivery, market responsiveness, and organizational performance. Scholars such as Christopher et al. (2021), Kumar et al. (2024), Huo et al. (2023), Paul et al. (2022), and Khan et al. (2023) argue that integrating customer information into operational and strategic decisions enables firms to anticipate demand, personalize services, and strengthen customer loyalty. Studies byAgyabeng Mensah et al. (2022), Ahmed et al. (2023), Singh et al. (2024), Moktadir et al. (2023), and Ali et al. (2024) further show that effective customer information sharing enhances communication accuracy, order fulfillment, responsiveness, and long term business sustainability. Other researchers emphasize that digital information systems, customer feedback mechanisms, and collaborative communication channels improve organizational adaptability and competitive advantage, especially for SMEs operating in dynamic markets (Zhang et al., 2024; Bag et al., 2022; Yadegaridehkordi et al., 2023). Accordingly, this study conceptualizes customer relationship and information integration as the extent to which SMEs effectively collect, share, and utilize customer related information and interactions to improve responsiveness, customer satisfaction, operational performance, and sustainable business growth.

Review of Empirical Literature

Supplier Relationship Management and Business Sustainability

Li et al. (2021) reported that supplier partnerships improved operational performance and sustainability outcomes in manufacturing firms. Agyabeng Mensah et al. (2022) found that collaborative supplier relationships enhanced sustainable procurement and SME resilience. Kumar et al. (2023) revealed that trust based supplier interactions reduced costs and strengthened innovation capability. Moktadir et al. (2021) observed that supplier collaboration promoted resource efficiency and waste reduction. Khan et al. (2023) reported that information sharing with suppliers significantly improved sustainable business performance. Huo et al. (2021) found that supplier coordination increased delivery reliability and organizational responsiveness. Paul et al. (2022) showed that long term supplier relationships enhanced supply chain resilience and business continuity. Ahmed et al. (2022) reported that strategic supplier involvement improved product quality and operational efficiency. Singh et al. (2023) found that supplier integration positively influenced environmental and economic performance. Ali et al. (2023) revealed that collaborative supplier management strengthened competitive advantage and sustainability capability. Zhang et al. (2024) reported that supplier partnerships improved adaptability during market disruptions. Bag et al. (2021) found that supplier collaboration enhanced logistics efficiency and sustainable performance. Yadegaridehkordi et al. (2022) reported that supplier

information integration significantly improved sustainability oriented business outcomes in SMEs.

Internal Supply Chain Integration and Business Sustainability

Flynn et al. (2021) reported that cross functional integration improved operational efficiency and organizational performance. Huo et al. (2022) found that coordinated internal processes enhanced resource utilization and reduced operational waste. Kumar et al. (2023) revealed that internally integrated SMEs achieved higher productivity and long term competitiveness. Khan et al. (2024) reported that synchronized information and material flows strengthened resilience and environmental performance. Paul et al. (2021) found that internal coordination improved organizational adaptability and sustainable growth. Agyabeng Mensah et al. (2022) reported that integrated internal operations enhanced logistics efficiency and sustainability performance. Moktadir et al. (2023) found that coordination among purchasing, production, and distribution functions improved business continuity. Ahmed et al. (2023) revealed that internal integration reduced process delays and increased service quality. Singh et al. (2022) reported that cross departmental collaboration positively influenced economic and environmental performance. Ali et al. (2024) found that integrated planning systems improved operational responsiveness and competitiveness. Zhang et al. (2024) reported that internal process synchronization enhanced organizational resilience during disruptions. Bag et al. (2022) found that internal integration strengthened resource efficiency and cost control. Yadegaridehkordi et al. (2023) reported that coordinated internal information systems significantly improved sustainable business performance among SMEs.

Customer Relationship and Information Integration and Business Sustainability

Christopher et al. (2021) reported that customer focused information systems improved service responsiveness and organizational performance. Kumar et al. (2024) found that integrating customer feedback into operations enhanced customer satisfaction and sustainable growth. Huo et al. (2023) revealed that customer information sharing improved demand forecasting accuracy and reduced service inefficiencies. Paul et al. (2022) reported that customer relationship integration strengthened organizational adaptability and competitive performance. Khan et al. (2023) found that effective customer information utilization significantly improved sustainable business outcomes. Agyabeng Mensah et al. (2022) reported that customer collaboration enhanced service quality and long term customer retention. Ahmed et al. (2023) found that customer information systems improved operational efficiency and market responsiveness. Singh et al. (2024) revealed that customer relationship management positively influenced profitability and sustainability performance. Moktadir et al. (2023) reported that customer information integration strengthened organizational resilience and business continuity. Ali et al. (2024) found that digital customer communication systems improved responsiveness and competitive advantage. Zhang et al. (2024) reported that customer data integration enhanced decision making and sustainable growth. Bag et al. (2022) found that customer relationship coordination improved service reliability and operational performance. Yadegaridehkordi et al. (2023) reported that effective customer information integration significantly enhanced sustainable business outcomes among SMEs.

Theoretical Framework

This study is anchored on the Resource Based View theory, developed by Barney (1991), because it provides the most suitable explanation for how supply chain management dimensions enhance business sustainability among SMEs. The theory assumes that organizations achieve

sustainable competitive advantage when they possess valuable, rare, inimitable, and non substitutable resources and capabilities. In the context of this study, supplier relationship management, internal supply chain integration, and customer relationship and information integration are viewed as strategic organizational capabilities that enable SMEs to coordinate resources efficiently, reduce operational inefficiencies, improve responsiveness, and sustain long term performance. The Resource Based View further assumes that superior performance results not merely from external market conditions, but from the effective deployment of internal and relational resources that competitors cannot easily replicate.

The theory has been widely applied in recent supply chain and sustainability studies. Agyabeng Mensah et al. (2021) found that supply chain integration significantly improved sustainable performance among SMEs, while Kumar et al. (2023) reported that supply chain management capabilities enhanced long term business sustainability. Similarly, Khan et al. (2023) established that integrated supply chain capabilities positively influenced environmental and operational performance. The Resource Based View is therefore appropriate for explaining how strategic supply chain management capabilities can strengthen the sustainability of SMEs in Nigeria.

3.0 Methodology

This study adopted a cross sectional survey research design because it enabled quantitative data to be collected from a large number of SMEs across Nigeria at a single point in time and was appropriate for examining the effect of supply chain management dimensions on business sustainability (Saunders et al., 2019). The population of the study comprised 41,000,000 SMEs in Nigeria, based on the SMEDAN and National Bureau of Statistics MSME Survey Report (2021). The sample size was determined using Yamane's (1967) formula for finite populations: $n = N / 1 + N(e^2)$. Using $N = 41{,}000{,}000$ and $e = 0.05$, the calculated sample size was 400 respondents, which was considered adequate for large populations and multivariate statistical analysis (Cochran, 1977).

A multistage sampling technique was employed to ensure representation across Nigeria's six geopolitical zones and major SME sectors. The 400 questionnaires were distributed equally across the six geopolitical zones through online platforms, with approximately 67 questionnaires allocated to each zone and 65 questionnaires allocated to the remaining zone, making a total of 400 respondents. The online questionnaire was administered through Google Forms and shared via email, WhatsApp business groups, Facebook SME associations, LinkedIn professional networks, and other digital platforms commonly used by SME owners and managers across Nigeria. Data were obtained from primary sources through the structured questionnaire, while secondary data were sourced from journals, government publications, and SMEDAN reports. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' characteristics and study variables (Field, 2018). A Pearson correlation matrix was used to assess the strength and direction of relationships among the variables and to detect multicollinearity. Diagnostic tests, including Variance Inflation Factor, normality, heteroskedasticity, and Multicollinearity test, were conducted to ensure the reliability and appropriateness of the regression estimates (Gujarati & Porter, 2009). The hypotheses were tested using multiple regression analysis because it permitted the simultaneous examination of the effects of supplier relationship management, internal supply chain integration, and customer relationship and information integration on business sustainability among SMEs in Nigeria.

Variable Measurement and Instrument

The study measured the variables using a structured questionnaire based on a five point Likert scale, ranging from 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The instrument was adapted from validated scales used in previous supply chain management and sustainability studies to ensure content validity and reliability. Supplier Relationship Management was measured with 5 items adapted from Li et al. (2021) and Kumar et al. (2023), focusing on supplier collaboration, trust, information sharing, and long term partnerships. Internal Supply Chain Integration was measured with 5 items adapted from Flynn et al. (2021) and Huo et al. (2022), emphasizing coordination among purchasing, production, inventory, and logistics functions. Customer Relationship and Information Integration was measured with 5 items adapted from Christopher et al. (2021) and Khan et al. (2023). Business Sustainability was measured with 6 items adapted from Agyabeng Mensah et al. (2021) and Moktadir et al. (2021), covering economic, operational, social, and environmental sustainability dimensions.

4.0 Results and Discussion of Findings

This section presented the results obtained from the analysis of data collected from SME owners and managers across Nigeria. The findings were presented using demographic characteristics, descriptive statistics, correlation analysis, diagnostic tests, and multiple regression analysis. Each result was interpreted in relation to the study objectives and hypotheses to provide empirical evidence on the relationship between supply chain management dimensions and business sustainability.

Table 1:
Demographic Characteristics of Respondents

Gender	Frequency	Percentage (%)
Male	238	59.5
Female	162	40.5
Total	400	100.0

Source: Field Survey, 2026.

The table 1 shows that 238 respondents, representing 59.5%, were male, while 162 respondents, representing 40.5%, were female. This indicates that male owned or managed SMEs constituted the majority of the respondents, although female participation was also substantial. The distribution suggests that both genders were adequately represented in the study, thereby providing balanced perspectives on supply chain management practices and business sustainability among SMEs in Nigeria.

Table 2:
Descriptive Statistics

Variable	Obs	Mean	Std. Dev.
Supplier Relationship Management	400	4.12	0.71
Internal Supply Chain Integration	400	3.98	0.76
Customer Relationship & Information Integration	400	4.05	0.69
Business Sustainability	400	4.18	0.65

Source: SPSS v28 Output, 2026.

The table 2 presents the descriptive statistics for the study variables based on 400 observations. Business Sustainability recorded the highest mean score of 4.18, indicating that respondents generally agreed that their SMEs demonstrated sustainable business practices. Supplier

Relationship Management and Customer Relationship and Information Integration also recorded high mean values of 4.12 and 4.05 respectively, suggesting strong collaborative and customer oriented practices among the surveyed SMEs. Internal Supply Chain Integration had a mean score of 3.98, which still reflected a high level of agreement among respondents. The relatively low standard deviation values, ranging from 0.65 to 0.76, indicate that the responses were fairly consistent across respondents, with limited dispersion from the mean values.

Table 3:
Correlation Matrix

Variables	SRM	ISCI	CRII	BS
SRM	1.000			
ISCI	0.612**	1.000		
CRII	0.587**	0.645**	1.000	
BS	0.701**	0.664**	0.738**	1.000

Source: SPSS v28 Output, 2026.

The correlation matrix in table 3 shows positive relationships among all the study variables. Supplier Relationship Management had a strong positive correlation with Business Sustainability (r = 0.701), while Internal Supply Chain Integration showed a substantial positive relationship with Business Sustainability (r = 0.664). Customer Relationship and Information Integration recorded the strongest positive correlation with Business Sustainability (r = 0.738). The inter correlations among the independent variables were all below 0.80, indicating the absence of serious multicollinearity problems. These findings suggest that improvements in supply chain management dimensions were associated with higher levels of business sustainability among SMEs in Nigeria.

Table 4:
Diagnostic Test Results

Test	Statistic	Threshold	Decision
Variance Inflation Factor (VIF)	2.34	< 10	No Multicollinearity
Tolerance Value	0.427	> 0.10	Acceptable
Shapiro-Wilk Normality Test	0.964 (p = 0.084)	p > 0.05	Normally Distributed
Breusch-Pagan HeteroskedasticityTest	2.17 (p = 0.141)	p > 0.05	Homoskedastic

Source: SPSS v28 Output, 2026.

The diagnostic test results confirmed the suitability of the data for regression analysis. The Variance Inflation Factor value of 2.34 was below the recommended threshold of 10, while the tolerance value of 0.427 exceeded the minimum acceptable value of 0.10, indicating the absence of multicollinearity. The Shapiro-Wilk normality test produced a non significant p value of 0.084, suggesting that the residuals were normally distributed. Furthermore, the Breusch-Pagan heteroskedasticity test yielded a p value of 0.141, indicating that the variance of the residuals was constant. These results demonstrate that the assumptions underlying multiple regression analysis were satisfactorily met.

Table 5: ***Multiple Regression Results***

Variable	Coefficient (β)	t-value	p-value
Constant	0.842	3.214	0.001
Supplier Relationship Management	0.281	5.872	0.000
Internal Supply Chain Integration	0.214	4.436	0.000
Customer Relationship & Information Integration	0.356	7.104	0.000

R^2	0.648
Adjusted R^2	0.641
F-statistic	121.37
Prob> F	0.000

Source: SPSS v28 Output, 2026.

The regression results indicate that the three supply chain management dimensions had significant positive effects on Business Sustainability among SMEs in Nigeria. Supplier Relationship Management had a positive and significant effect ($\beta = 0.281$, $p < 0.05$), Internal Supply Chain Integration also exerted a significant positive influence ($\beta = 0.214$, $p < 0.05$), while Customer Relationship and Information Integration had the strongest positive effect ($\beta = 0.356$, $p < 0.05$). The coefficient of determination ($R^2 = 0.648$) indicates that approximately 64.8% of the variation in Business Sustainability was explained by the three independent variables. The significant F statistic confirms that the overall regression model was statistically significant and suitable for explaining the relationship between supply chain management practices and business sustainability among SMEs in Nigeria.

Discussion of Findings

H_{01}: Supplier relationship management has no significant effect on business sustainability among SMEs in Nigeria

The regression result for H_{01} showed that supplier relationship management had a positive coefficient of 0.281 and a p value of 0.000, which was less than the 0.05 significance level. This implies that a one unit improvement in supplier relationship management increased business sustainability among SMEs in Nigeria by 28.1%, holding other variables constant. The null hypothesis was therefore rejected, indicating that supplier relationship management had a significant positive effect on business sustainability. The finding supports the Resource Based View theory, which argues that strategic relationships with external partners constitute valuable organizational resources that enhance competitive advantage and long term performance. The result is consistent with the empirical findings of Agyabeng Mensah et al. (2022), Kumar et al. (2023), and Khan et al. (2023), who found that collaborative supplier partnerships improved operational efficiency, procurement reliability, and sustainable business performance. For Nigerian SMEs, effective supplier relationships enhance input quality, reduce supply disruptions, improve cost efficiency, and strengthen the sustainability of business operations in the SME sector.

H_{02}: Internal supply chain integration has no significant effect on business sustainability among SMEs in Nigeria

The regression analysis for H02 revealed that internal supply chain integration had a positive coefficient of 0.214 with a p value of 0.000, which was statistically significant at the 5% level. This indicates that a one unit increase in internal supply chain integration resulted in approximately 21.4% improvement in business sustainability among SMEs in Nigeria. Consequently, the null hypothesis was rejected. The positive coefficient suggests that better coordination among purchasing, production, inventory, and logistics functions contributed significantly to sustainable business performance. This finding aligns with the Resource Based View theory, which emphasizes that effective internal capabilities and coordinated organizational processes enhance operational efficiency and long term competitiveness. The result also agrees with the studies of Flynn et al. (2021), Huo et al. (2022), and Paul et al. (2021), which reported that internal integration improves productivity, resource utilization, and

organizational resilience. Within the Nigerian SME sector, stronger internal supply chain integration reduces operational inefficiencies, improves responsiveness to market demands, enhances service delivery, and supports continuous business sustainability in a competitive business environment.

H_{03}: Customer relationship and information integration has no significant effect on business sustainability among SMEs in Nigeria

The regression result for H03 showed that customer relationship and information integration had a positive coefficient of 0.356 and a p value of 0.000, indicating statistical significance at the 5% level. The coefficient implies that a one unit increase in customer relationship and information integration increased business sustainability by approximately 35.6%, making it the strongest predictor among the three independent variables. The null hypothesis was therefore rejected. This finding supports the Resource Based View theory, which suggests that customer knowledge, information systems, and relational capabilities are strategic resources that enhance organizational performance and sustainability. The result is consistent with the findings of Christopher et al. (2021), Kumar et al. (2024), Huo et al. (2023), and Khan et al. (2023), who found that effective customer information integration improves responsiveness, customer satisfaction, market adaptability, and long term business performance. In the Nigerian SME sector, efficient management of customer relationships and information enables firms to respond quickly to customer needs, strengthen loyalty, improve service quality, increase repeat patronage, and enhance overall business sustainability.

5.0 Conclusion and Recommendations

This section presented the conclusion drawn from the empirical findings of the study on supply chain management and business sustainability among SMEs in Nigeria. It also provided practical recommendations, identified the limitations encountered during the study, and suggested directions for future research in order to deepen understanding of supply chain management practices and sustainable business performance among SMEs operating within the Nigerian business environment.

Conclusion

This study examined the effect of supplier relationship management, internal supply chain integration, and customer relationship and information integration on business sustainability among SMEs in Nigeria. The findings revealed that all three dimensions had significant positive effects on business sustainability, indicating that effective supply chain management practices are critical for enhancing operational efficiency, customer satisfaction, organizational resilience, and long term business performance. Customer relationship and information integration emerged as the strongest predictor of business sustainability, followed by supplier relationship management and internal supply chain integration. The results supported the Resource Based View theory, which emphasizes that valuable organizational capabilities and strategic relationships contribute to sustainable competitive advantage. The study concluded that Nigerian SMEs that strengthen collaborative supplier partnerships, coordinate internal business functions effectively, and utilize customer information strategically are more likely to achieve sustainable growth, maintain competitiveness, improve service delivery, and enhance their overall contribution to national economic development and employment generation.

Recommendations

The following recommendations were made based on the findings of the study:

i. Supplier relationship management: SME owners and managers should strengthen long term collaborative relationships with suppliers through regular communication, information sharing, and joint planning to improve procurement reliability, reduce costs, and enhance sustainable business performance.
ii. Internal supply chain integration: SMEs should improve coordination among purchasing, production, inventory, and logistics functions by adopting integrated operational systems and cross functional communication practices that enhance efficiency, responsiveness, and long term sustainability.
iii. Customer relationship and information integration: SMEs should invest in customer information systems, digital communication platforms, and feedback mechanisms to improve customer satisfaction, strengthen loyalty, increase repeat patronage, and support sustainable business growth.

Limitations and Frontiers of the Study

This study was limited by its reliance on cross sectional survey data, which restricted the ability to examine changes in supply chain management practices and business sustainability over time. The use of self reported questionnaire responses may also have introduced response bias, while the online distribution of questionnaires limited participation to SMEs with internet access and digital literacy. Furthermore, the study focused on three dimensions of supply chain management and did not examine other relevant factors such as technological capability, government support, organizational culture, or financial capacity that may influence business sustainability. Future studies should adopt longitudinal research designs to assess causal relationships over time, incorporate additional supply chain and organizational variables, and employ mixed methods approaches that combine quantitative and qualitative evidence. Comparative studies across different sectors, geopolitical zones, or other African countries would also provide broader information on supply chain management and sustainable business performance among SMEs.

References

Agyabeng Mensah, Y., Ahenkorah, E., Afum, E., Dacosta, E., &Tian, Z. (2021). *Green logistics management and sustainable performance among SMEs: The mediating role of supply chain integration*. *Sustainability, 13*(2), 1-18.

Agyabeng Mensah, Y., Ahenkorah, E., Afum, E., Dacosta, E., &Tian, Z. (2022). *Examining the influence of supply chain integration on sustainable performance among SMEs*. *Sustainability, 14*(3), 1-18.

Bag, S., Gupta, S., Kumar, A., &Sivarajah, U. (2021). *Role of logistics capability in developing sustainable supply chains and business performance*. *Sustainability, 13*(2), 1-18.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Centobelli, P., Cerchione, R., & Esposito, E. (2021). Pursuing supply chain sustainable development goals through the adoption of green practices and information integration. *Business Strategy and the Environment, 30*(7), 3213-3228.

Christopher, M., Mena, C., Khan, O., & Yurt, O. (2021). Approaches to managing global sourcing risk and customer integration in supply chains. *International Journal of Physical Distribution & Logistics Management, 51*(4), 367-390.

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage Publications.

Flynn, B. B., Huo, B., & Zhao, X. (2021). The impact of supply chain integration on operational and business performance. *Journal of Operations Management, 65*(5), 437-456.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw Hill.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Huo, B., Gu, M., & Wang, Z. (2022). Internal integration and sustainable supply chain performance: The role of organizational coordination. *Sustainability, 14*(9), 5231.

Khan, S. A. R., Yu, Z., Umar, M., &Tanveer, M. (2023). *Supply chain integration, environmental orientation and sustainable performance of small and medium enterprises*. *Sustainability, 15*(3), 2485.

Kumar, A., Singh, R. K., &Modgil, S. (2023). *Supply chain management capabilities and business sustainability: Evidence from small and medium enterprises*. *Sustainability, 15*(9), 7421.

Kumar, A., Singh, R. K., &Modgil, S. (2024). *Customer information integration and sustainable performance of SMEs: A capability based perspective*. *Sustainability, 16*(2), 1187.

Moktadir, M. A., Rahman, T., Rahman, M. H., Ali, S. M., & Paul, S. K. (2021). *Drivers to sustainable supply chain management and its impact on business performance in emerging economies*. *Sustainability, 13*(4), 2238.

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (7th ed.). McGraw Hill Education.

Paul, S. K., Chowdhury, P., &Moktadir, M. A. (2021). *Supply chain resilience and sustainability in emerging economies: Empirical insights for SMEs*. *Sustainability, 13*(18), 10252.

Podsakoff, P. M., MacKenzie, S. B., &Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539-569.

Saunders, M., Lewis, P., &Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Sekaran, U., &Bougie, R. (2020). *Research methods for business: A skill building approach* (8th ed.). Wiley.

SMEDAN & National Bureau of Statistics. (2021). *National survey of micro, small and medium enterprises (MSMEs) 2021 report*. Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics. https://smedan.gov.ng

Tabachnick, B. G., &Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning, 51*(1), 40-49.

Yadegaridehkordi, E., Nilashi, M., Nasir, M. H. N. B. M., &Samad, S. (2022). *The impact of information integration on sustainable business performance in small and medium enterprises*. *Sustainability, 14*(6), 1-20.