EFFECT OF SUPPLY CHAIN MANAGEMENT ON THE PERFORMANCE OF SMES IN NORTH CENTRAL NIGERIA

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Abstract:

This study examined the effect of supply chain management on the performance of SMEs in North Central Nigeria. The study adopted the descriptive research design using the survey method of which questionnaires were administered to a sample of (349) youths in north central. The responses were analyzed using smart PLS. It was found that sourcing has positive and significant effect on SMEs performance while planning revealed a negative and significant effect on SMEs performance. It was recommended that Small and Medium-sized Enterprises (SMEs) are encouraged to strengthen their sourcing competencies by cultivating long-term partnerships with dependable suppliers, integrating digital procurement technologies, and conducting regular assessments of supplier performance. In addition, government bodies and development partners should offer targeted training and support initiatives aimed at enhancing the procurement capabilities of SME managers. SMEs should embrace more dynamic and flexible planning approaches, such as scenario-based and adaptive planning methods. This entails actively engaging employees in the planning process, utilizing real-time data to inform decisions, and minimizing rigid or overly formalized planning systems that may hinder innovation and organizational agility.

Keywords: *Supply Chain Management, Planning, Sourcing and Performance.*

INTRODUCTION

Small and Medium Enterprises (SMEs) are critical to the economic growth and development of many emerging economies, including Nigeria, where they contribute significantly to employment generation, poverty reduction, and gross domestic product (GDP) (Adegbite et al., 2023). SMEs in Nigeria, particularly those in the North Central region, often face operational inefficiencies that hinder their growth and sustainability. One major factor influencing their performance is the effectiveness of supply chain management (SCM). SCM encompasses the planning, coordination, and control of all activities involved in sourcing, procurement, production, logistics, and customer service (Chopra & Meindl, 2021). Efficient supply chain practices can lead to reduced operational costs, improved product quality, faster delivery times, and increased customer satisfaction, which ultimately enhance firm performance (Abubakar & Bala, 2022).

In the context of North Central Nigeria, infrastructural limitations, weak transportation networks, poor inventory systems, and inadequate supplier coordination have undermined the ability of SMEs to deliver value efficiently (Oluwajimi & Ibrahim, 2021). Moreover, the absence of integrated supply chain technologies and limited knowledge of SCM principles further exacerbate performance issues. Recent studies have underscored the positive correlation between robust SCM strategies and firm performance indicators such as profitability, market share, and customer retention (Mohammed et al., 2023). As SMEs strive to compete in an increasingly globalized and technologically driven market, adopting modern supply chain practices has become not only essential but strategic. Therefore, examining the effect of supply chain management on the performance of SMEs in North Central Nigeria provides valuable insight into how logistics, procurement, inventory management, and customer relationship strategies can drive sustainable growth and competitiveness in the region (Nwachukwu & Okechukwu, 2022).

Small and medium-sized enterprises (SMEs) in North Central Nigeria have been seen as an important tool for its role in the region's economic development by providing employment, fostering innovation, and contributing to local economies. Despite their importance, many small and medium-sized enterprises (SMEs) in North Central Nigeria are struggling to perform well due to problems in how they manage their supply chains. They often face high operating costs, poor product quality, and delays in getting products to customers. These challenges make it hard for them to compete, satisfy customer needs, or make enough profit. As a result, many of these businesses experience poor growth and even risk failure.

This situation not only affects the survival of individual SMEs but also slows down the economic development of the entire region.

The main objective of this research work is to examine the effect of supply chain management on the performance of SMEs in North Central Nigeria, other specific objectives are to:

    i.   To examine the effect of supply chain planning on the performance of SMEs in North Central Nigeria.

    ii.   To assess how sourcing strategies influence the performance of SMEs in North Central Nigeria.

The following hypotheses was formulated to guide the research:

H_{01}: Supply chain planning has no significant effect on the performance of SMEs in North Central Nigeria.

H_{02}: Sourcing strategy does not significantly influence the performance of SMEs in North Central Nigeria.

LITERATURE REVIEW

Supply Chain Management

Kenton (2022) viewed supply chain management as the oversight of materials, information, and finances as they move from supplier to manufacturer to wholesaler to retailer to consumer. This management style focuses on reducing waste, streamlining operations, and creating competitive advantages for businesses involved. Kenton's approach emphasizes SCM's role in enhancing operational efficiency and value creation. Supply Chain Management (SCM) is one of the important functions that need to be performed efficiently in every business. Organizations have now realized that their success depends on their capacity to design and manage their SCM system effectively, in order to reap maximum benefits and sustain their competitive advantage (Lenin, 2014).

Ivanov and Dolgui (2021) defined supply chain management as the management of the flow of goods and services, encompassing all processes that transform raw materials into final products. They emphasize that SCM aims to maximize customer value and achieve a sustainable competitive advantage by creating and managing interconnected networks of companies and suppliers. Supply chain management (SCM) is a set of managerial practices which includes sourcing raw materials, manufacturing and assembling products, managing warehousing and inventory, monitoring supply and demand, distributing and delivering finished products to the customer (Agus, 2010).

Mentzer et al. (2021) described supply chain management as a collaborative approach to managing business processes and relationships within and beyond organizational boundaries. According to them, SCM involves close cooperation among various supply chain actors to efficiently manage the flow of goods, information, and finances. Their view emphasizes the relationship-building aspect of SCM to enhance efficiency and effectiveness throughout the supply chain. The supply chain management includes all of those activities associated with moving goods from the raw-materials stage through to the end user. This includes sourcing and procurement, production scheduling, order processing, inventory management, transportation, warehousing and customer service. SCM also embodies the information systems which are necessary to monitor all of those activities.

Planning

Akinyele and Fasogbon (2018) posited that planning is the systematic process of envisioning a desired future state and formulating the necessary steps to achieve that state. It is a key management function that provides direction, sets goals, and outlines strategies to achieve those goals. Planning involves determining what resources are needed, how to allocate them, and identifying potential obstacles while formulating contingencies to mitigate risks. It is the process of setting objectives, determining the strategies to achieve these objectives, and developing plans to integrate and coordinate activities. Furthermore, it is a fundamental managerial function that helps ensure all efforts are aligned with organizational goals and that resources are used efficiently. Ajao (2017) emphasized that planning is the

process of defining an organization's strategy and making decisions on how to allocate resources to pursue this strategy. It enables organizations to stay competitive and ensure long-term success through careful assessment and strategic decision-making.

Robinson (2020) stated that planning is an ongoing process that involves analyzing current trends, setting short-term and long-term goals, and adjusting the strategy based on evolving market conditions. It is the process of determining the objectives of an organization, formulating strategies to achieve these objectives, and designing tactics to execute those strategies. In the same vein, Schilling (2017) defined planning as the process of mapping out an organization's future direction by assessing internal and external factors, setting measurable goals, and aligning activities to meet those goals. In addition, planning in a contemporary setting also involves anticipating potential risks and fostering innovation within a structured framework.

Aguoru et al., (2018) opined that planning is the process of deciding in advance what is to be done, when, how, and by whom. planning is essential for resource allocation and coordination and stresses that effective planning is key to organizational success and innovation. Also, Levinson (2018) defined corporate planning as creation of strategy for meeting business goals and improving business operations. It is a road map which provides the enterprise with necessary actions required to be operational. Writing down the specific and generic plans of enterprises is necessary without which predetermined goals cannot be reached and unity of purpose on the part of employees cannot be achieved thereby making the enterprise activities to be undefined and haphazard. For managers and owners of businesses who imbibe the doctrine of corporate planning, business activities tend to yield more result than those who do not.

Sourcing

Amajor et al., (2019) posited that sourcing to the process of identifying, evaluating, and acquiring goods, services, or resources from external suppliers or vendors. It plays a pivotal role in shaping organizational performance by ensuring access to the best materials, talent, or technologies at optimal costs. In addition, sourcing have evolved to reflect its strategic importance, especially in a globalized and highly competitive business environment. the proactive and continuous process of assessing and improving an organization's procurement activities. It involves identifying the right suppliers, negotiating contracts, and fostering long-term relationships to enhance performance, reduce costs, and increase efficiency. Strategic sourcing goes beyond simple procurement and involves aligning sourcing decisions with the company's overall business strategy. A specific form of sourcing, outsourcing involves contracting third-party service providers to handle specific tasks or functions that were traditionally performed in-house. Outsourcing can enhance efficiency by allowing organizations to focus on their core competencies while benefiting from specialized expertise and cost savings. Strategic sourcing it deals with searching of markets for potential input sources, searching for alternative sources and keeping the relevant knowledge up to date (Vollman et al., 2016).

Lewicki et al., (2018) defined strategic sourcing as a systematic and fact-based approach for optimizing an organization's supply base and improving the overall value proposition. Also, Lv (2019) established that a successful firm sourcing strategy should be characterized by three key interrelated decisions which includes, criteria for establishing a supplier base; criteria for selecting suppliers who will receive an order from the firm; and the quantity of goods to order from each supplier selected. Furthermore, sourcing is regarded as complex exercise especially when dealing with unique raw materials, ingredients, parts, components, connectors, apparatus, products, equipment, supplies, and services increase and the numbers of buyers involved in the decisions expand.

Planning and Performance

Calyxtus et al., (2023) investigated how corporate planning can impact on the performance of organizations with reference to five selected Insurance Companies in Lagos. A descriptive survey design was adopted in the study. Relevant data was obtained through the questionnaire and a convenience sampling technique was used to draw a sample of three hundred and seventy-two (372) respondents

comprising employees of the selected Insurance Companies in Lagos State, Nigeria. Data were analysed using the Frequency Distribution and percentages. The Simple linear regression and Multiple regression analysis were adopted in testing the hypotheses. The study findings revealed that Corporate Planning enables achievement of organizational goals as well as enhances organizational competitiveness. The study concluded that planning is a strategic tool for positively influences organizational outcomes. The study therefore, recommends that since environmental factors are ever-changing, managers make plans flexible and open for adaptation and change. However, the study could have provided more detailed recommendations tailored to the insurance industry, such as strategies for integrating technology into corporate planning or addressing regulatory challenges unique to the sector.

Akpoyibo and Edeme (2023) conducted a study titled "the effect of corporate planning on organizational growth: A Study of Sunny City Hotel, Ughelli, Delta State," which investigated the influence of corporate planning on organizational growth, with a particular emphasis on employee job growth, motivational packages, and productivity. The study employed a mixed-methods approach, utilizing both primary and secondary data sources. Data were analyzed using statistical tools such as frequency distribution tables, percentages, means, standard deviations, and T-tests to test key hypotheses, including whether corporate planning has no effect on timely service delivery. The findings demonstrated that corporate planning plays a significant role in driving organizational growth, particularly through effective resource allocation and employee development initiatives. The study concluded that corporate planning is a crucial strategy for fostering organizational growth and recommended that Sunny City Hotel, as well as similar establishments, prioritize the development of advanced resource management systems to support innovation and growth. However, the study's lack of a representative and well-defined sample significantly undermines its generalizability and reliability.

Sourcing and Performance
Catherine et al., (2024) analyzed the effectiveness of strategic sourcing for improving firm's performance. A cross-sectional approach was adopted with primary data collected. The data yielded a response rate of 375 from electricity firms in Kenya. The data collected were put through rigorous statistical analysis to test content validity as well as reliability. simple linear regression model was used to test relationships between strategic sourcing and firm's performance. The finding suggests that a successful implementation of strategic sourcing improves firm's performance through adoption of multiple sourcing strategies as well as maintaining manageable supply base. Furthermore, the study reveals that wrong choice of suppliers can negatively compromise the quality of products and services of the firm. Research limitations/implications Strategic sourcing is complex and very sensitive issue.

Ojo and Adebayo (2023) explored the impact of sustainable sourcing on the performance of agribusiness firms in Nigeria. The study adopted a quantitative research design, collecting data from 150 agribusiness managers through structured questionnaires. The population included firms in the agricultural sector, and a stratified random sampling technique was used. Data were analyzed using regression analysis. The findings indicated that sustainable sourcing positively impacts organizational performance by improving resource efficiency and stakeholder satisfaction. The study recommended that agribusiness firms adopt sustainable sourcing practices to enhance their competitiveness and contribute to environmental sustainability.

Transaction Cost Analysis (TCA) Theory:
Transaction Cost Analysis (TCA) Theory, developed by economist Ronald Coase in his seminal 1937 paper, The Nature of the Firm, and further refined by Oliver Williamson in the 1970s and 1980s, provides a framework for understanding the costs associated with economic exchanges, particularly the costs incurred in coordinating and managing transactions between firms. Coase introduced the idea that firms exist because organizing transactions internally can sometimes be more cost-effective than relying on market exchanges. Williamson expanded on Coase's ideas by categorizing transaction costs into three key areas: search and information costs, bargaining and decision costs, and policing and enforcement costs.

TCA Theory explores the factors that influence whether a firm should make or buy goods or services i.e., whether it is more cost-efficient to conduct transactions within the firm (internal procurement) or outsource them to external suppliers (market procurement). The theory underscores that transaction costs can arise from factors such as information asymmetry, opportunistic behavior, asset specificity, and uncertainty in the transaction process.

Methodology
The study adopted a survey research design. The population of the study consists of (130,862) registered SMEs in North Central, Nigeria. The sample size of (400) was determined using Taro Yamane (1968) sample selection formula. Convince sampling techniques was used and the procedure involved selecting participants based on their availability and willingness to participate to enable the collection of data. The study used primary data. Data were collected using a 5-point Likert scale structured questionnaire. The data collected was analyzed using smart-PLS SEM.
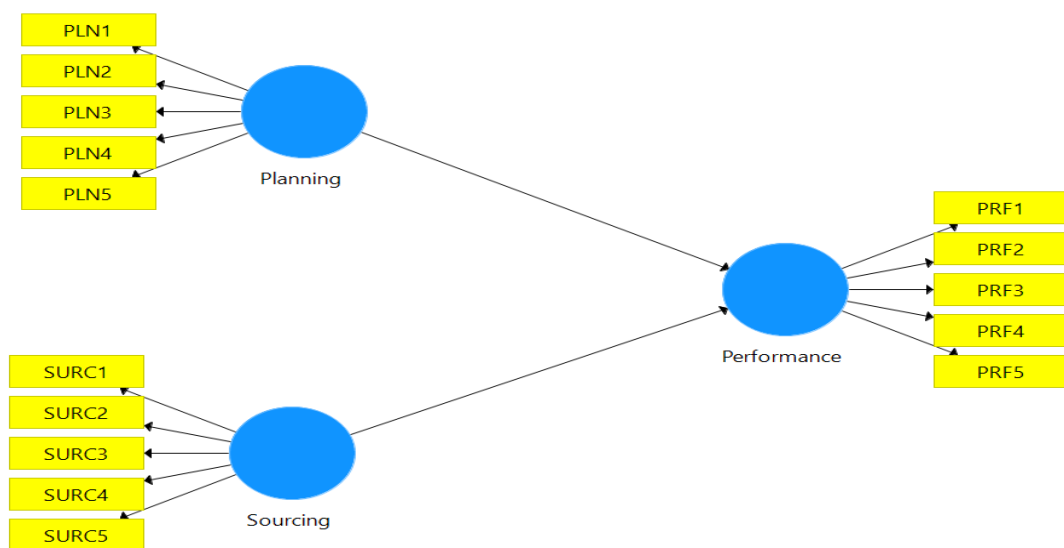

Figure 1: Study Model

RESULTS AND DISCUSSIONS
Table 1.1: Reliability of study scale

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Performance	0.873	0.882	0.914	0.728
Planning	0.827	0.853	0.895	0.739
Sourcing	0.786	0.801	0.860	0.606

Source: Smart PLS Output, 2025

Composite reliability of Jöreskog's (1971) was applied to test for the internal consistency of the items. All the values fall within the Hair, et al., (2019) rating of good consistency. The Cronbach alpha value was above 0.60 which is the minimum threshold as recommended by Sekaran (2010). To test for the convergent validity, the average variance extracted (AVE) was used. All the latent variables showed values greater than 0.50 which indicates that the constructs explain at least 50 percent of the variance of its items. According to Henseler et al., (2015), the Fornell-Larcker criterion does not perform well when explaining discriminant validity, particularly when the indicator loadings on a construct differ only slightly. As a replacement, they proposed the Heterotrait-Monotrait (HTMT) ratio of the correlations which is the mean value of the item correlations across constructs relative to the (geometric) mean of

the average correlations for the items measuring the same construct (Voorhees et al., 2016). Discriminant validity problems are present when HTMT values are higher than 0.90 for structural models (Henseler, et al., 2015).

Table 1.2: Outer Loadings

	Performance	Planning	Sourcing
PLN3		0.841	
PLN4		0.872	
PLN5		0.865	
PRF1	0.796		
PRF2	0.924		
PRF3	0.904		
PRF4	0.779		
SURC1			0.724
SURC3			0.797
SURC4			0.801
SURC5			0.789

The outer loadings presented in the table reflect the strength of the relationship between latent constructs (Performance, Planning, and Sourcing) and their respective measurement items in a structural equation modeling (SEM) framework, specifically for assessing the effect of supply chain management on SME performance in North Central Nigeria. Outer loadings, which range from 0 to 1, indicate how well each item explains its underlying construct, with values closer to 1 signifying stronger relationships and values above 0.7 generally considered acceptable for confirming construct validity (Hair et al., 2019).

For the Planning construct, items PLN3 (0.841), PLN4 (0.872), and PLN5 (0.865) also demonstrate strong outer loadings, suggesting that these items likely related to demand forecasting, strategic alignment, or planning efficiency are highly reflective of the planning dimension of supply chain management.

For the Sourcing construct, items SURC1 (0.724), SURC3 (0.797), SURC4 (0.801), and SURC5 (0.789) show acceptable to strong loadings, with SURC4 being the strongest indicator (0.801), implying that these items effectively measure sourcing practices, such as supplier reliability or procurement quality. However, SURC1's loading (0.724) is the lowest, though still acceptable, suggesting it may be a slightly weaker indicator of the sourcing construct, possibly due to contextual factors like supplier variability in North Central Nigeria.

Lastly, for the Performance construct, the items PRF1 (0.796), PRF2 (0.924), PRF3 (0.904), and PRF4 (0.779) exhibit strong outer loadings, with PRF2 and PRF3 showing particularly high values (0.924 and 0.904, respectively), indicating that these items are robust indicators of SME performance, capturing aspects such as profitability, operational efficiency, or customer satisfaction effectively. PRF1 and PRF4, while slightly lower, still exceed the 0.7 threshold, confirming their reliability as measures of performance.

Table 2 Heterotrait-Monotrait Ratio (HTMT)

	PLANNING	SOURCING	PERFORMANCE
PLANNING			
SOURCING	0.858		
PERFORMANCE	0.570	0.541	

Source: Smart PLS Output, 2025

Model Goodness of Fit (GoF)

Sequel to the need to validate the PLS model, there is a need to assess the goodness of fit of the model as Hair, et al. (2017) suggested. This study used the standardised root mean square residuals (SRMR).

The choice of this index was based on the fact that the SRMR provides the absolute fit measure where a value of zero indicates a perfect fit. The study adopted Hu & Bentler's (1998) suggestion that a value of less than 0.08 represents a good fit while applying SRMR for model goodness of fit. The study result indicates an SRMR value of 0.01. This indicates the model is fit.

Assessing the Structural Model

Having satisfied the measurement model assessment, the next step in evaluating PLS-SEM results is to assess the structural model. Standard assessment criteria, which was considered include the path coefficient, t-values, p-values, and coefficient of determination (R^2). The bootstrapping procedure was conducted using a resample of 5000.
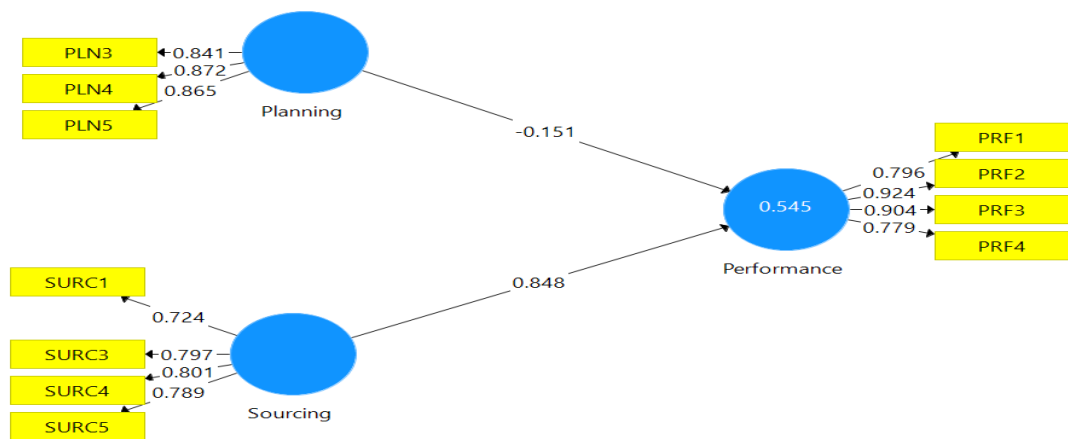

Fig. 3: Path Coefficients of the Regression Model

The R-square value stood at 545%, indicating that supply chain management represented by planning and sourcing are responsible for 54% variation in the SMEs performance. The remaining 46% variation could be explained by other factors not included in the study. Based on Hair, et al., (2019), the R-square is considered suitable and lends credence to the study's findings. The result of the path analysis is presented in the table below.
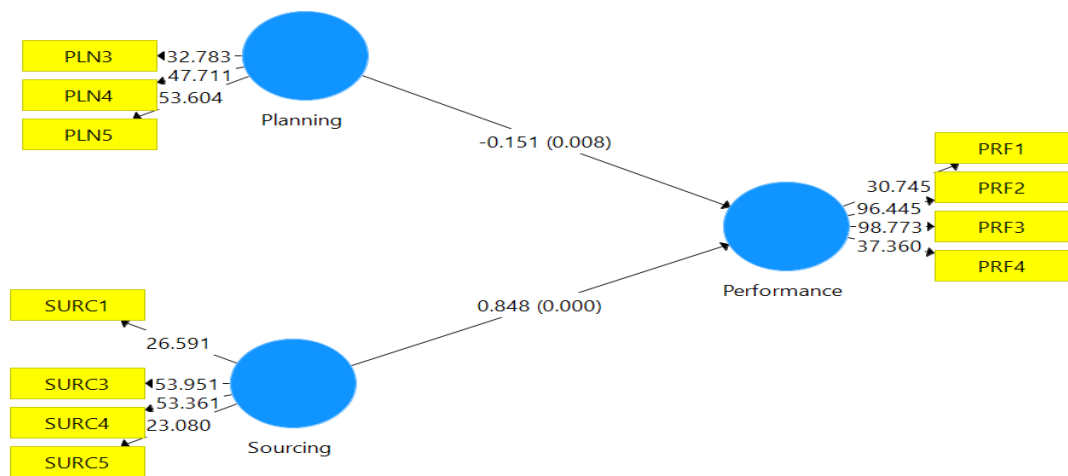

Table 3.1: Path Coefficients showing the Results.

Hypothesis	Variable	Path Coefficient ***(Beta)	t-value	p-value	Findings
Ho$_1$	Planning	-0.151	2.6705	0.008	Rejected
Ho$_2$	Sourcing	0.848	15.099	0.000	Rejected

Source: Smart PLS Output, 2025

Discussions

The result for table shows that planning has a negative and statistically significant effect on SME performance, with a path coefficient (β) of -0.151, a t-value of 2.6705, and a p-value of 0.008. Since the p-value is less than 0.05, the null hypothesis is rejected, indicating a significant relationship. This implies that poor or rigid planning practices may hinder flexibility, responsiveness, or adaptability especially in the dynamic operating environment of SMEs in North Central Nigeria.

Lastly, the second result shows that sourcing has a strong positive and highly significant effect on SME performance, with a path coefficient (β) of 0.848, a t-value of 15.099, and a p-value of 0.000. The p-value being well below 0.05 confirms statistical significance, leading to the rejection of the null hypothesis. This indicates that effective sourcing practices such as timely procurement, strong supplier relationships, and cost-effective material acquisition greatly enhance the performance of SMEs.

CONCLUSION AND RECOMMENDATIONS

Based on the findings above, the study concluded that sourcing has a strong positive and statistically significant effect on SME performance. The study concludes that firms that implement effective sourcing strategies such as engaging reliable suppliers, ensuring timely procurement, and negotiating favorable terms are more likely to experience improved operational outcomes and competitiveness. Also, that planning demonstrated a negative but statistically significant impact on performance. The study also, concludes that overly rigid or inappropriate planning mechanisms may reduce the agility and responsiveness of SMEs in a dynamic business environment.

Based on the findings of the study, the following recommendations are proposed:

i. Small and Medium-sized Enterprises (SMEs) are encouraged to strengthen their sourcing competencies by cultivating long-term partnerships with dependable suppliers, integrating digital procurement technologies, and conducting regular assessments of supplier performance. In addition, government bodies and development partners should offer targeted training and support initiatives aimed at enhancing the procurement capabilities of SME managers.

ii. SMEs should embrace more dynamic and flexible planning approaches, such as scenario-based and adaptive planning methods. This entails actively engaging employees in the planning process, utilizing real-time data to inform decisions, and minimizing rigid or overly formalized planning systems that may hinder innovation and organizational agility.

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Questionnaire

Key: SA = Strongly Agree,   A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree

S/N	Planning	SA	A	U	D	SD
1	Our firm has clear supply chain objectives aligned with business goals.					
2	We regularly forecast demand to guide our supply chain activities.					
3	There is a strategic plan for handling supply chain disruptions.					
4	Our supply chain planning reduces operational costs and improves efficiency.					
5	We use data analytics or software tools to support supply chain planning.					
	Sourcing					
6	We work with reliable suppliers that meet our quality standards.					
7	Supplier selection is based on performance metrics like cost and quality.					
8	We maintain long-term relationships with our key suppliers.					
9	Our firm engages in ethical and sustainable sourcing practices.					
10	There is a formal system for evaluating supplier performance.					
	SME Performance					
11	My business demonstrates strong financial health, with consistent revenue growth and effective cost management.					
12	My business operates efficiently, with streamlined processes and effective use of resources to achieve its goals.					
13	My business has ability to innovate and adapt to changing market conditions and customer needs.					
14	My business meets or exceeds customer expectations, resulting in high levels of satisfaction and loyalty.					
15	My business has strong growth potential and is well-positioned to scale its operations in the future.					