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EFFECTS OF SUPPLY CHAIN MANAGEMENT (SCM) ON THE COMPETITIVE ADVANTAGE OF SELECTED INDIGENOUS AUTOMOBILE COMPANIES IN NIGERIA

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ABSTRACT

This study examined the effects of Supply Chain Management (SCM) on the competitive advantage of selected indigenous automobile companies in Nigeria, emphasizing the significance of raw material sourcing and product design on cost efficiency and consumer loyalty. The research employs a positivist philosophy with a descriptive and survey-based design, combining quantitative data from 50 Ministries, Departments, and Agencies (MDAs) and staff from three indigenous automobile companies. A structured questionnaire was used to collect data, and multiple regression and correlation analyses were conducted using SPSS to explore the relationships between raw material sourcing, product design, cost efficiency, and consumer loyalty. Findings from this research highlight the strategic importance of SCM in achieving cost efficiency through efficient raw material sourcing and in building stronger customer loyalty via sustainable product design. The study recommended that indigenous automobile companies should focus on establishing long-term partnerships with reliable suppliers to ensure a consistent supply of high-quality raw materials.

Keywords: Supply Chain Management, Competitive Advantage, Product Design

1.0 INTRODUCTION

1.1 Background to the Study

The rapid pace of globalization, technological advancements, and shifting customer expectations have revolutionized the way businesses operate. Organizations today are increasingly challenged to deliver products and services faster, cheaper, and with higher quality. In this context, Supply Chain Management (SCM) has emerged as a pivotal framework that integrates the flow of materials, information, and finances across the supply chain network to achieve operational efficiency and strategic business objectives. Effective SCM is no longer seen as a support function but as a critical enabler of competitive advantage, which can determine a firm's survival and growth in an intensely competitive marketplace. SCM focuses on optimizing the end-to-end processes involved in delivering goods and services to customers. This involves managing procurement, production, transportation, warehousing, and distribution activities in a synchronized manner. At its core, SCM seeks to minimize costs, improve customer satisfaction, and respond effectively to market dynamics. The ability to

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efficiently manage these processes directly impacts an organization's ability to achieve competitive advantage

In Nigeria's automobile industry, SCM plays a pivotal role in establishing a competitive edge. As Nigeria's economy continues to evolve, embracing SCM practices becomes a strategic imperative for indigenous companies. By optimizing supply chains and enhancing resource efficiency, SCM helps companies cut operational costs and improve overall financial performance. This study aims to explore the intricate relationship between sustainable supply chain management and competitive advantage within the context of indigenous automobile companies in Nigeria. Understanding how SSCM practices influence brand image and competitive advantage is crucial for the growth and long-term viability of indigenous companies in this dynamic market.

1.2 Statement of the Problem

Adeleye (2020), Nwankwo & Gbadamosi (2020), Carter & Rogers (2020), Adegbuyi et al., (2020) and Zhu (2020) have all contributed to the understanding of the challenges faced by indigenous companies in the Nigerian automobile industry. They highlight the need for supply chain management (SCM) to maintain a competitive edge against foreign brands. However, these companies face challenges in establishing raw material sourcing practices, product designs and balancing sustainability goals with competitiveness.

Adegbuyi et al. (2020) highlighted the importance of continuous improvement and innovation in SCM, while Nwankwo & Gbadamosi (2020) highlighted the perceived inferiority of indigenous brands compared to foreign brands. This study aims to provide a comprehensive analysis of how SCM practices and competitiveness intersect in the context of indigenous automobile companies in Nigeria, addressing the research gap and advancing our understanding of the challenges and opportunities faced by indigenous companies in a competitive global market.

1.3 Research Questions

The following questions are instrumental in addressing the research problems identified in this study:

i. How does raw material sourcing affect the cost efficiency of indigenous automobile companies in Nigeria?
ii. What is the relationship between product design and consumer loyalty towards products of indigenous automobile companies in Nigeria?

1.4 Research Objectives

The primary objective of this study is to evaluate the effects of Supply Chain Management (SCM) on the competitive advantage of selected indigenous automobile companies in Nigeria, and to achieve this, the following specific research objectives have been established to comprehensively address the key factors influencing cost efficiency and consumer loyalty within this context:

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i. To determine how raw material sourcing affects the cost efficiency of indigenous automobile companies in Nigeria.
ii. To examine the relationship between product design and consumer loyalty towards products of indigenous automobile companies in Nigeria.

1.5 Research Hypotheses

The hypotheses for this study aim to investigate the relationships between Supply Chain Management (SCM) practices and competitive advantage within the context of indigenous automobile companies in Nigeria and are stated in Null form as follows;

(H01): There is no significant impact of raw material sourcing on the cost efficiency of indigenous automobile companies in Nigeria.

(H02): There is no significant relationship between product design and consumer loyalty towards products of indigenous automobile companies in Nigeria.

1.6 Scope of the Study

This study delves into the effects of Supply Chain Management (SCM) on the competitive advantage of selected indigenous automobile companies operating in Nigeria. Nigeria serves as the primary geographic context for this research due to its dynamic market, unique challenges, and growth potential within the automobile industry. The Nigerian automotive landscape is characterized by a mix of both indigenous and foreign automobile companies, making it an ideal setting to explore SCM's impact on indigenous firms (Yin, 2017).

The research centers on the automobile industry, a sector that plays a pivotal role in Nigeria's economy and industrial development. Given the industry's significance, investigating the interplay between SCM practices and competitive advantage within this specific sector holds relevance for both academia and industry stakeholders (Saunders et al., 2018). The study focuses on a selected group of indigenous automobile companies currently operating in Nigeria. Data will be collected directly from these companies, their customers and users to ensure the research's precision and applicability. These chosen companies represent a diverse range of experiences and challenges within the Nigerian automobile market, contributing to a holistic understanding of SSCM's impact (Bryman & Bell, 2019).

Consequently, this study's scope encompasses an exploration of SCM's influence on the competitive advantage of selected indigenous automobile companies operating within Nigeria's dynamic automobile industry. The research hones in on specific variables, incorporates a geographical and industry focus in the context of the Nigerian market. Through this comprehensive scope, the study aims to contribute to a deeper understanding of SCM's implications for indigenous companies in Nigeria's evolving automotive sector.

1.7 Limitations of the Study

This study explores the relationship between SCM, cost efficiency and consumer loyalty in indigenous automobile companies in Nigeria. However, its findings may not be generalizable due to geographical focus, industry specificity, data availability, and subjective assessment of

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brand image. The study's findings are contingent on the available data and may not fully apply to other industries. The researcher overcame this challenge by conducting comparative studies across different regions and industries, using a larger and more diverse dataset to enhance the generalizability of the findings.

2.0 LITERATURE REVIEW

2.1 Supply Chain Management (SCM)

The concept of SCM has evolved significantly over time. According to Christopher (2020), SCM is defined as "the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole." This definition emphasizes the importance of collaboration and integration across the entire supply chain. Contrastingly, Mentzer et al. (2020) offer a broader definition, considering SCM as a systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain. This perspective underscores the strategic and systemic nature of SCM, highlighting its cross-functional breadth.

Simchi-Levi et al. (2020) presents a more nuanced definition, focusing on the role of SCM in achieving a competitive advantage. They define SCM as the design and management of seamless, value-added processes across organizational boundaries to meet the real needs of the end customer. This definition places significant emphasis on the creation of value and the seamless integration of processes. In contrast, Hugos (2020) views SCM as “the art and science of integrating the flows of products, information, and financials through the entire supply chain from the supplier's suppliers to the customer's customers. This definition broadens the scope to include the integration of product, information, and financial flows.

2.1.2 Transition into Sustainable Supply Chain Management

The transition from traditional supply chain management (SCM) to sustainable supply chain management (SSCM) represents a significant shift in corporate strategies and operational models. This transition is not merely an additive process but a transformative one, where sustainability becomes a core component of supply chain strategies and practices. By incorporating variables such as strategic supplier relationships, pricing, and innovation/continuous improvement, this transition can be understood more comprehensively.

In defining SSCM, Carter and Rogers (2020) emphasize the integration of environmental and social considerations into supply chain management. They describe SSCM as the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes.

This definition highlights the balance of the triple bottom line: profit, planet, and people. Conversely, Ahi and Searcy (2020) focus on the operational aspects of SSCM, defining it as the management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental, and social, into account.

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This definition underscores the practical aspects of integrating sustainability into supply chain operations. Seuring and Müller (2020) offer a more process-oriented perspective, viewing SSCM as "the management of supply chain operations, resources, information, and funds to achieve sustainable environmental, social, and economic objectives." This definition highlights the importance of managing both tangible and intangible resources. In contrast, Pagell and Shevchenko (2020) define SSCM in the context of risk management and resilience, emphasizing the need for sustainable practices to enhance the supply chain's ability to withstand and adapt to external pressures and changes.

2.1.3 Components of Supply Chain Management (SCM)

Carter and Rogers (2020) highlight this as a fundamental component, emphasizing the need for companies to extend their focus beyond economic metrics to include environmental stewardship and social responsibility. This holistic approach contrasts with traditional SCM, which primarily focuses on efficiency and cost-effectiveness. For instance, supplier relationship management remains a core component in both SCM and SSCM. However, in SSCM, as Seuring and Müller (2020) argue, the focus shifts towards building relationships with suppliers who demonstrate commitment to sustainable practices. This includes evaluating suppliers not just on cost and quality, but also on their environmental and social performance, a practice less emphasized in traditional SCM.

2.1.3.1 Raw Material Sourcing

Raw material sourcing are pivotal components of Supply Chain Management (SCM). In SCM, raw material sourcing transcend traditional boundaries, focusing not only on cost and efficiency but also on sustainability. According to Ketchen and Hult (2018), these relationships are grounded in collaboration and long-term partnerships, with a shared commitment to sustainability goals. This approach contrasts with traditional SCM, where raw material sourcing are often transactional and cost-driven. Tachizawa and Wong (2018) emphasize the importance of collaboration in SCM. Suppliers are viewed as partners in the journey towards sustainability, involving joint efforts in innovation, waste reduction, and ethical practices. This collaborative approach fosters a more resilient and responsive supply chain, capable of adapting to sustainability challenges.

A key aspect of raw material sourcing in SCM, as noted by Beske and Seuring (2018), is transparency. Open communication channels are essential for monitoring compliance with standards and for identifying areas for improvement. This level of transparency is often absent in traditional SCM models. raw material sourcing in SCM, as defined by Pagell and Wu (2018), involves selecting suppliers who not only offer competitive prices and quality but also adhere to environmental and social standards. This practice is integral to the overall sustainability of the supply chain, impacting everything from resource conservation to social responsibility. Gold and Heikkurinen (2018) discuss the challenge of balancing cost, quality, and sustainability in sourcing decisions. Sustainable sourcing often involves a premium, reflecting the higher costs associated with ethical labor practices and eco-friendly materials. This balance is a key differentiator from traditional SCM, which primarily focuses on cost and quality.

2.1.3.2 Product Design

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Product design, as a critical component of Supply Chain Management (SCM), refers to the process of conceptualizing and developing products that meet customer needs, incorporate sustainable practices, and align with the overall objectives of the supply chain. It plays a pivotal role in determining a company's competitive advantage, particularly in industries such as automobile manufacturing. Various scholars have provided extensive insights into the definition and concepts of product design, with a focus on its impact on sustainability and competitive advantage. Ulrich and Eppinger (2016) define product design as the activity of determining the product's form and function, translating customer needs into product attributes. They emphasize that product design encompasses not only aesthetics but also functionality, quality, and performance, which ultimately affect a company's market competitiveness. In the context of SCM, product design should integrate practices such as material selection, energy efficiency, and waste reduction (Ulrich & Eppinger, 2016). Baxter (2018) asserted that product design is a multidisciplinary process involving market research, engineering, and manufacturing to create products that meet customer expectations while maintaining cost-effectiveness. Baxter's work underlines the importance of considering environmental impacts during the design process, advocating for the incorporation of sustainable materials and processes to achieve long-term competitiveness (Baxter, 2018). Chiu and Okudan (2020) expand the concept of product design to include sustainability as a core principle. They argue that product design involves developing products that minimize environmental damage throughout their lifecycle, from raw material extraction to end-of-life disposal. Their research highlights the growing need for companies, especially in the automobile industry, to adopt eco-friendly materials and energy-efficient designs to reduce carbon footprints and improve brand image (Chiu & Okudan, 2020). Pigosso et al. (2019) suggest that sustainable product design is essential for achieving competitive advantage in industries with high environmental impact, such as automobile manufacturing. They argue that by integrating life cycle assessment (LCA) into the product design process, companies can identify potential environmental impacts early and make informed decisions that enhance both sustainability and profitability (Pigosso et al., 2019).

2.2 Competitive Advantage

Competitive advantage is a central concept in the field of business strategy, referring to the attributes or capabilities that allow a company to outperform its competitors. Porter, a leading authority on competitive strategy, defines competitive advantage as the position a company achieves when it can create more economic value than its competitors. He emphasizes the importance of either cost efficiency, differentiation, or focus as the basis for achieving this advantage (Porter, 2018) Contrarily, Barney's resource-based view (RBV) of the firm suggests that competitive advantage is derived from a firm's unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable. He argues that these resources and capabilities enable a firm to implement strategies that improve its efficiency and effectiveness (Barney, 1991 cited in Cahyono (2022).

Teece, Pisano, and Shuen (1997 cited in Astawa et al., 2021) propose the dynamic capabilities framework, suggesting that competitive advantage lies in a firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. This perspective views competitive advantage as dynamic and evolving. Some believed that competitive advantage is achieved by creating "blue oceans" of uncontested market space, as

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opposed to competing in oversaturated "red oceans." They emphasize the importance of innovation in creating new demand and making the competition irrelevant (Kim & Mauborgne, 2005 as cited in Astawa et al., 2021).

Lee et al (2021) also suggested that competitive advantage arises from the collective learning in the organization, especially in coordinating diverse production skills and integrating multiple streams of technologies. They emphasize the role of core competencies in enabling a company to access a wide variety of markets. These definitions, while varied, highlight different aspects of competitive advantage, ranging from market positioning and resource capabilities to innovation and core competencies. Each perspective offers a unique lens through which to understand and achieve competitive advantage in various business contexts. Porter defines competitive advantage as the ability of a firm to create superior value for its customers and superior profits for itself (Keller, 2018) emphasizes cost efficiency, differentiation, and focus strategies as key to achieving this advantage.

2.2.1 Consumer Loyalty

Consumer loyalty is increasingly recognized as a crucial measure of competitive advantage in the modern business landscape. There are various perspectives on how consumer loyalty serves as a barometer for competitive advantage. Consumer loyalty refers to a customer's consistent preference for a brand over its competitors. Oliver (2018) defines it as a deeply held commitment to re-buy or re-patronize a preferred product or service in the future, despite situational influences and marketing efforts having the potential to cause switching behavior. Also, Reichheld (2018) differentiates between emotional and behavioral loyalty.

Emotional loyalty relates to how strongly customers feel about a brand, while behavioral loyalty refers to their actual purchasing behavior and frequency. Aaker (2018) posits that customer loyalty provides a competitive edge, as loyal customers are less likely to switch to competitors, even in the face of price changes or competitors' promotional efforts. Keller (2018) links consumer loyalty to brand equity, suggesting that loyal customers contribute to a stronger brand, which in turn serves as a competitive advantage by ensuring consistent revenue streams and reducing marketing costs.

2.2.2 Cost Efficiency

Cost efficiency is a fundamental competitive strategy that aims to position a firm as the lowest-cost producer in its industry. This strategy is central to achieving a competitive advantage, as it allows a company to offer products or services at prices lower than its competitors, attracting price-sensitive customers and increasing market share. According to Porter's (1980) seminal work, cost efficiency is one of three generic strategies (alongside differentiation and focus) that firms can adopt to achieve competitive advantage. More recent studies have expanded on this idea, emphasizing that cost efficiency is not just about reducing costs but also about maintaining acceptable levels of quality and service. Ghemavat (2020) highlights that achieving cost efficiency requires firms to optimize all aspects of their operations, from sourcing raw materials to manufacturing and distribution. By doing so, companies can reduce costs significantly while still meeting customer expectations (Ghemavat, 2020).

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Sull and Turconi (2021) define cost efficiency as a strategy that leverages economies of scale, efficient production processes, and tight control over overhead costs. These scholars argue that firms following a cost efficiency strategy must ensure cost reductions across all business functions, including procurement, logistics, and marketing. However, they caution that firms pursuing this strategy must avoid compromising the quality of their products, as doing so can erode customer trust and brand reputation (Sull & Turconi, 2021). Several scholars have identified the key elements necessary for implementing a successful cost efficiency strategy. Kumar and Mishra (2021) argue that one of the primary drivers of cost efficiency is achieving economies of scale, which allow firms to reduce per-unit costs by producing large volumes of goods. The ability to spread fixed costs over a larger output base reduces overall expenses, making the firm more competitive in price-sensitive markets (Kumar & Mishra, 2021).

2.3 Theoretical Framework

The strategic management of indigenous automobile companies in Nigeria faces unique challenges and opportunities. To navigate this landscape effectively, this study adopts the theoretical framework of Market Orientation Theory and the Resource-Based View (RBV) Theory. Market Orientation, as conceptualized by Kohli and Jaworski (1990), and further developed by Narver and Slater (1990), revolves around the premise that understanding and meeting customer needs is paramount for business success. This theory advocates for a customer-centric approach, where continuous information gathering about customers and competitors informs decision-making (Kumar et al., 2016). The integration of efforts across all organizational departments is seen as crucial in this approach, emphasizing a holistic adoption of market orientation beyond just the marketing department.

However, this theory has faced criticism for its potential myopia. Critics argue that an overemphasis on current customer needs can lead to a short-term focus, potentially at the expense of long-term innovation and adaptation to future market changes (Homburg et al., 2016). Furthermore, the theory's reactive nature, focusing on responding to existing market conditions, may inhibit a company's ability to be a market leader through innovation. Ethical concerns also arise, particularly regarding the aggressive pursuit of customer satisfaction, which can lead to privacy invasions or cultural insensitivity in global markets. Additionally, the resource-intensive nature of implementing a market-oriented strategy poses challenges, especially for smaller organizations with limited resources.

On the other hand, the Resource-Based View (RBV), as articulated by Barney (1991), posits that a firm's unique, valuable, and inimitable resources are the key to achieving and sustaining a competitive advantage. This view assumes resource heterogeneity and immobility, suggesting that these unique resources, which are not easily transferable between firms, are what differentiate a firm in the marketplace (Kozlenkova et al., 2016). Despite its widespread acceptance, RBV has not been without criticism. A primary concern is its tautological nature, where resources are deemed valuable because they provide a competitive advantage, leading to circular reasoning (Kraaijenbrink et al., 2016). The theory has also been criticized for its internal focus, often underestimating the role of external market forces and industry dynamics. Identifying which resources will provide a sustainable competitive advantage is another challenge, as the theory offers limited practical guidance. Moreover, RBV has been critiqued for overlooking the importance of dynamic capabilities in rapidly changing industries and for

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its overemphasis on firm-specific resources, potentially neglecting the value of collaborative strategies like alliances and partnerships.

In practice, a synthesis of Market Orientation and RBV theories could offer a more comprehensive strategy for businesses. By integrating the external focus of Market Orientation with the internal emphasis of RBV, firms can develop a more balanced approach to achieving competitive advantage. This integrated perspective acknowledges the importance of both adapting to market needs and leveraging unique internal resources, providing a nuanced framework for strategic decision-making in the complex business landscape of today.

2.4 Empirical Review

Khanal et al. (2023) study investigates the impact of Green Supply Chain Management (GSCM) practices on organizational performance using Structural Equation Modeling (SEM) and multivariate statistical analysis. The research highlights the mediating role between operational efficiency, organizational performance, and GSCM practices. The findings suggest that GSCM practices play a crucial role in enhancing organizational performance by improving operational efficiency. However, the lack of a specified study location may limit understanding of the cultural and economic context of the findings. This study extends the concept of green practices in SCM, aligning with Al-Maathidi and Al-Shammari's (2023) focus on GSCM but with a broader analytical approach.

Wijaya's (2023) Investigated the influence of entrepreneurial strategy and social capital on sustainable supply chain management (SCM) and organizational performance. Utilized Partial Least Square analysis. The study which was conducted in Indonesia used Partial Least Square (PLS) analysis to explore the influence of entrepreneurial strategy and social capital on organizational performance and sustainable supply chain management (SCM). The research concluded that both entrepreneurial strategy and social capital positively affect organizational performance and sustainable SCM practices. This study aligns with Afnan & Minwir (2023) research in Bahrain on green supply chain management, highlighting the importance of strategic approaches in supply chain management for organizational performance.

Norzawani, Suheil, Nik and Afif (2023) conducted a literature review in Malaysia to highlight the intersection of supply chain risks, GSCM practices, and organizational performance. The study underscores the importance of managing supply chain risks and implementing GSCM practices to enhance organizational performance. This research direction aligns with Silitonga, Marla and Sarah (2023) study on the impact of supply chain management practices on competitive advantage and organizational performance, emphasizing the strategic importance of SCM in achieving organizational goals.

Afnan and Minwir (2023) Explored the impact of Green Supply Chain Management (GSCM) practices on organizational performance. The study, which was conducted in Bahrain, utilized PLS-SEM, investigated the relationship between specific green supply chain management (GSCM) practices and organizational performance. The findings indicate a positive correlation between GSCM practices and various measures of organizational performance. This research complements Norzawani et al. (2023) study on the intersection of supply chain risks, GSCM practices, and organizational performance, emphasizing the impact of sustainable and green practices in supply chain management.

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Silitonga, Marla and Sarah (2023) study in Bandung, Indonesia, used multiple linear regression and path analysis to examine how supply chain management influences competitive advantage and indirectly affects company performance. The research highlights the critical role of SCM practices in gaining a competitive edge and improving organizational performance. This study complements Hejazi's (2022) research in Saudi Arabia on the association between organizational performance and supply chain management practices, both emphasizing the strategic significance of SCM in enhancing organizational outcomes.

2.5 Research Gap

While previous studies, such as those by Khanal et al. (2023) and Afnan & Minwir (2023), have focused extensively on Green Supply Chain Management (GSCM) practices and their impact on organizational performance, there is a noticeable gap in examining the specific relationship between Sustainable Supply Chain Management (SSCM) and competitive advantage, particularly in the context of indigenous automobile companies in Nigeria. Most of the empirical literature has centered around GSCM, entrepreneurial strategy, and supply chain risk management, as demonstrated in studies conducted in locations such as Indonesia, Malaysia, Bahrain, and Saudi Arabia. However, these studies lack a detailed investigation of how raw material sourcing affects cost efficiency or how product design influences consumer loyalty—key elements of competitive advantage—within the unique economic and cultural framework of Nigerian automobile companies.

Moreover, the current body of research predominantly employs methodologies such as Structural Equation Modeling (SEM) and Partial Least Square (PLS) analysis to explore broad organizational performance metrics. There is limited empirical focus on how specific SCM practices directly contribute to distinct competitive strategies like cost efficiency and consumer loyalty. Therefore, this study addresses the gap by investigating the role of SCM in enhancing cost efficiency and consumer loyalty, which are crucial for the competitive advantage of indigenous automobile companies operating in Nigeria. This contextual focus will provide insights that are currently underexplored in the empirical literature.

3.0 METHODOLOGY

3.1 Research Philosophy

The philosophy of research encompasses the principles guiding the process of data collection and analysis. For the present study, a positivist philosophy was chosen for conducting the research. This philosophy aligns with the testing of hypotheses introduced in the first chapter and advocates the use of quantitative methods. It prioritizes the use of various quantitative techniques and emphasizes the importance of objective analysis. Its rigorous approach to data collection and analysis can generate reliable and generalizable findings (Creswell, 2009).

3.2 Research Design

The research design suitable for the study on the indigenous automobile industry in Nigeria is a combination of descriptive and survey methods. The descriptive aspect of the research involves systematically collecting, analyzing, and presenting factual and objective information about the industry. This includes data on product design and raw material sourcing.

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Complementing the descriptive method, the survey approach was utilized to gather primary data from a targeted group of respondents, which includes staff from the selected indigenous automobile companies and relevant stakeholders in the Ministries, Departments, and Agencies (MDAs). The survey was conducted using a structured questionnaire, designed to elicit responses that are quantitative in nature.

3.3 Population of the Study

The study focuses on the intersection of Supply Chain Management (SCM), and Competitive Advantage within the context of the indigenous automobile companies in Nigeria. The primary population for this study encompasses the staff and management of all nine indigenous automobile companies, as reported by the Bureau of Public Procurement (BPP, 2024). In addition, the study involves a significant segment of customers, specifically targeting Ministries, Departments, and Agencies (MDAs) in Nigeria. A total of 943 MDAs, as identified by ThisDay (2024), are considered for participation.

The inclusion criteria for these MDAs will be the utilization of vehicles from these indigenous companies for a period exceeding two years. This criterion is essential to assess the long-term impact of SSCM on brand image and competitive advantage. The data on MDAs and indigenous automobile companies, as sourced from ThisDay (2024) and BPP (2024), will ensure that the study's sample is both relevant and representative of the broader spectrum of stakeholders in Nigeria's automotive sector.

3.4 Sampling and Sampling Technique

This study examines Supply Chain Management (SCM) and Competitive Advantage in the Nigerian indigenous automobile industry. A nuanced sampling approach is used, with a sample size of 50 MDAs, resulting in a margin of error of approximately 13.86%. The methodology uses a stratified sampling technique, categorizing MDAs into distinct strata based on attributes like size, location, or vehicle usage patterns. A random sample of 50 MDAs is selected, ensuring a balanced representation of various segments. The study also includes staff from three recognized indigenous automobile companies. This ensures a comprehensive understanding of internal company dynamics and external market interactions. However, the stratified sampling technique faces criticism for its complexity and potential for sampling bias. Additionally, it can be more time-consuming and costly compared to simple random sampling due to the need for detailed population information.

3.5 Data Collection Instrument

The study used a structured questionnaire with 40 questions to gather data on the competitive advantage of indigenous automobile companies in Nigeria. The first section will include 5 demographic questions to gather background information, such as qualifications, experience, job role, and industry experience. The remaining 35 questions addressed specific areas, such as raw material sourcing and product design, The questionnaire will be a mix of multiple-choice and Likert-scale to elicit quantitative insights. To facilitate efficient distribution, the questionnaire was created and shared using Google Forms, which offers advantages like ease of distribution and streamlined data collection.

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3.6 Methods of Data Analysis

The study on indigenous automobile companies in Nigeria embarks on a multifaceted analysis, integrating various aspects such as product design and. This comprehensive examination is crucial for understanding the dynamics that influence cost efficiency, consumer loyalty and competitive advantage in the sector.

To achieve the study's objectives, a methodical approach utilizing multiple regression and correlation analyses will be employed. These statistical techniques are particularly adept at unraveling complex relationships between multiple independent variables and a single dependent variable, providing a nuanced understanding of the factors at play. The Statistical Package for the Social Sciences (SPSS) will serve as the primary tool for this analysis, given its robust capabilities in handling and analyzing large datasets.

The investigation begins by exploring the challenges in supplier relationships and raw material sourcing, assessing their impact on the cost-effectiveness of the companies. This analysis will extend to examining the relationship between sustainable pricing strategies and consumer loyalty, a critical aspect for long-term business success.

3.6.1 Model Specification

The revised study model for the indigenous automobile industry in Nigeria focuses on understanding how various independent variables influence two key dependent variables: cost efficiency and consumer loyalty. The model is structured to capture the intricate relationships and impacts of these factors

Independent Variables:

Raw Material Sourcing (RMS): Evaluating the difficulties and challenges faced in maintaining supplier relationships and sourcing raw materials.

Product Design (PD): Investigating the practices of managing and responding to product designs and consumer demands.

Dependent Variables:

Cost efficiency (CE): Measured in terms of production efficiency, profitability, and cost savings.

Consumer Loyalty (CL): Assessed through metrics like repeat purchases, brand advocacy, and customer retention.

Model Equations:

The relationships in the model can be represented by the following regression equations:

Cost efficiency Model:

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$CE = \beta0 + \beta1(RMS) + \beta2(PD) + \epsilon$

Consumer Loyalty Model:

$CL = \beta0 + \beta1(RMS) + \beta2(PD) + \epsilon$

In these equations:

CE and CL represent Cost efficiency and Consumer Loyalty, respectively. β0 is the intercept in each equation.

β1−β2 are the coefficients for the independent variables.

ϵ represents the error term.

This model hypothesizes that the independent variables (RMS, PD) have a direct impact on both cost efficiency and consumer loyalty. The multiple regression analysis will reveal the extent to which each independent variable and each aspect of brand image influences cost efficiency and consumer loyalty. The coefficients β_1-β2 will provide insights into the strength and direction of these relationships. By incorporating these specific dimensions of brand image, the study aims to provide a more nuanced understanding of the factors driving consumer loyalty and cost efficiency in Nigeria's indigenous automobile industry.

4.0 RESULTS AND DISCUSSION

4.1 Test of Hypotheses

Test of Hypothesis One (H01): There is no significant impact of raw material sourcing on the cost efficiency of indigenous automobile companies in Nigeria.

Table 1: Model Summary

odel		Square	Ad justed R Square	St d. Error of the Estimate
	767[a]	589	.58 7	.33 314

a. Predictors: (Constant), RMS

A regression analysis model summary (Table 1) is presented with correlation coefficient (R) = 0.767, implying strong positive relationship between the predictor variable (RMS) and dependent variable. The Adjusted R Square value of 0.587 has been derived implying the actual R Square of 0.589 out of which 0.589 is explained by the model referred specifically to the model due to 0.589 in the R Square value. The standard error of the estimate (0.33314) reflects the average distance from data points to the regression line, and the smaller the better. For the most part, the data seems to match with the model.

Table 2: ANOVAa

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Model		Sum of Squares	f	Mean Square		ig.
	Regression	42.259		42.259	380.773	.000[b]
	Residual	29.521	266	.111		
	Total	71.781	267			

a. Dependent Variable: CE
b. Predictors: (Constant), RMS

The ANOVA results for the regression model are given in Table 2. Model variance and residual variance are represented by variability explained by the model (regression sum of squares 42.259) and unexplained variability (residual sum of squares 29.521). The regression has one degree of freedom (df) and the residual has 263 degrees of freedom (df) (df model = 1, df residual = 266), and mean square is 42.259 F statistic is 380.773, indicating that our model is highly significant. Our confirmation of this is represented with a p value (Sig.) of .000 which confirms that the predictor versus the dependent variable relationship is statistically significant at a 95 percent confidence level. Such a result indicates a strong predictive power of the model.

Table 3: Coefficientsa

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta		ig.
	(Constant)	1.069	.154		.964	000
	MS	.759	.039	.767	9.513	000

a. Dependent Variable: CE

The coefficients of the regression model are listed in Table 3. Where raw material sourcing (RMS) has an unstandardized coefficient (B) of 0.759 which means for each unit increase in RMS, cost efficiency (CE) increases by 0.759. The baseline value of CE when RMS is zero is represent by 1.069, or a constant value of 1.069. RMS is found to have a very strong positive relationship with CE; its standardized coefficient (Beta) is 0.767. Showing that RMS is a strong predictor of consumer loyalty is the t-value (19.513) adn the p value (Sig.) of .0000 which suggests that this relationship is highly statistically significant.

Test of Hypothesis Two (H02): There is no significant relationship between product design and consumer loyalty towards products of indigenous automobile companies in Nigeria.

Table 4: Model Summary

odel		Square	Adjusted R Square	Std. Error of the Estimate
	669[a]	448	.446	.39048

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a. Predictors: (Constant), PD

The regression model in Table 4 predicts consumer loyalty function of product design (PD). .669, the R value, is strong positive correlation between PD and consumer loyalty. A product design explanation accounts for approximately 44.8 % of the variation in consumer loyalty since the R Square value is .448. This Adjusted R Square, .446, accounts for the number of predictors in the model. The .39048 of the standard error of the estimate is the average distance of the observed values from the regression line. The results show that product design explains a substantial amount of the variance in consumer loyalty in general.

Table 5: ANOVAa

Model	Sum of Squares	f	Mean Square		ig.
Regression	32.863		32.863	15.531	000[b]
Residual	40.558	66	.152		
Total	73.420	67			

a. Dependent Variable: CL
b. Predictors: (Constant), PD

The ANOVA results for a regression analysis for PD as a predictor and CL as dependent variable are shown in Table 5. The p value (Sig.) for the regression model also shows it to be significant (.000). With F-value of 215.531, the model explains a considerable part of variance in consumer loyalty. The regressiion sum of squares (32.863) is the amount of variation in CL that is explained by PD and the residual sum of squares (40.558) is the amount of variation which is not explained by PD. Overall, our results indicate that CL is dominated by PD.

Table 6: Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		ig.
(Constant)	1.507	.166		.095	000
D	.609	.041	.669	4.681	000

a. Dependent Variable: CL

A regression model predicting consumer loyalty (CL) from product design (PD) is presented in Table 6. For every unit increase in PD, the loyal consumer exhibits an increase by 0.609 units, and this is equivalent to an unstandardized coefficient of 0.609. A strong positive relationship between PD and CL, with a standardized Beta coefficient of 0.669, is indicated in the standardized Beta coefficient of 0.669. This confirms that the PD is significant to CL since the t value of 14.681 and the significance level of 0.000. Furthermore, the baseline level of CL

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when PD=0 is represented by constant 1.507. On the whole, the table indicates a large and significant influence of product design on consumer loyalty.

4.2 Findings

Raw Material Sourcing and Cost Efficiency

The study revealed that there is a significant impact of raw material sourcing on the cost efficiency of indigenous automobile companies in Nigeria. This finding resonates with Khanal et al. (2023), which emphasizes the role of supply chain practices in enhancing organizational performance. Efficient raw material sourcing can lead to cost reductions and improved operational efficiency, aligning with the broader implications of green supply chain management practices that aim to enhance performance. However, unlike the GSCM focus on environmental sustainability, the current study highlights a more direct cost-related approach, underscoring the strategic importance of local sourcing in achieving competitive advantage.

Product Design and Consumer Loyalty

Findings from the analysis revealed that there is a significant relationship between product design and consumer loyalty towards products of indigenous automobile companies in Nigeria. This finding correlates with Ujianto et al. (2022), which discusses the significance of product design innovation in achieving competitive advantage. The emphasis on design aligns with the notion that innovative and consumer-oriented products can strengthen loyalty, as supported by the findings of Afnan & Minwir (2023), which highlighted how strategic approaches in SCM can lead to enhanced customer satisfaction. Both studies suggest that product design is critical for maintaining consumer interest and loyalty in a competitive market.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study has elucidated the effects of Supply Chain Management (SSCM) on the competitive advantage of selected indigenous automobile companies in Nigeria, emphasizing the significance of raw material sourcing and product design. By employing a quantitative approach, the research analyzed the interrelationships among these variables and their effects on competitive advantage of selected indigenous automobile companies in Nigeria.

The analysis demonstrated that effective raw material sourcing is a fundamental driver of cost efficiency for indigenous automobile companies. The ability to procure raw materials at competitive prices not only lowers production costs but also enables companies to offer more attractive pricing to consumers. In a market where affordability is paramount, strategic sourcing can serve as a significant advantage. This finding emphasizes the need for companies to cultivate strong supplier relationships and adopt innovative approaches to manage their supply chains, ultimately reducing vulnerability to market fluctuations.

Product design emerged as another pivotal factor influencing consumer loyalty and brand perception. The study's results indicate that a strong emphasis on aesthetics, functionality, and innovation can significantly enhance consumer engagement with automotive products. As

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consumers become increasingly discerning, indigenous automobile companies must prioritize research and development efforts to align their offerings with evolving consumer preferences. This focus on design not only fosters loyalty but also positions companies as leaders in innovation within the automotive sector, thereby enhancing their overall competitiveness.

5.2 Recommendations

These recommendations are tailored to address each hypothesis and their respective findings, ensuring that companies can effectively navigate the challenges of the automotive market while maximizing performance and competitiveness.

i. Indigenous automobile companies should focus on establishing long-term partnerships with reliable suppliers to ensure a consistent supply of high-quality raw materials. Companies can leverage technology to enhance supply chain transparency, reduce costs, and mitigate risks associated with fluctuations in raw material prices. Additionally, diversifying sourcing options and considering local suppliers can help reduce dependency on international markets, thereby fostering a more resilient supply chain.

ii. It is crucial for automobile companies to invest in research and development (R&D) to innovate and refine their product designs. This investment should include gathering consumer insights through surveys, focus groups, and market research to align products with customer preferences. Companies can also explore collaborations with design firms and academic institutions to enhance their design capabilities and incorporate cutting-edge technology, ensuring that their vehicles not only meet but exceed consumer expectations.

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