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Multiple Sourcing Strategy and Operational Efficiency of Automotive Manufacturing Companies in Nigeria

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Abstract : The study examined the relationship between multiple sourcing and operational efficiency of automotive manufacturing companies in Nigeria. The study adopted and explanatory research design. The population of this study consist of 37 accredited automotive manufacturing companies operating in Nigeria and 74 respondents comprising procurement managers and production managers provided primary data for the study through structured questionnaire designed in Likert 5- point scale. The reliability of the study instrument was determined using the Cronbach's Alpha reliability test, and 2 null hypotheses were tested using Pearson Product Moment Correlation with the aid of the Statistical Package for Social Sciences, version 25.0. Test of hypotheses revealed that multiple sourcing has a very strong, positive and statistically significant relationships with cost reduction, and a moderate, positive and statistically significant relationship with on time delivery. The study concludes that multiple sourcing significantly relates with operational efficiency of automotive manufacturing companies in Nigeria; and recommends that managers of the companies operating in the automotive industry must consider diversifying procurement sources to mitigate risks related to supply chain disruptions and supplier insolvencies.

Keywords: *Multiple sourcing, Operational efficiency, Cost reduction, On time delivery.*

1.0 INTRODUCTION

1.1 Background of the Study

The automotive industry in Nigeria is a dynamic and highly competitive sector due to its growing domestic market size (Nnamani, Ajagu & Nnamani, 2015), and is characterized by its advancement in technology, product diversification and changing market demand. The industry is crucial to creating jobs and bolstering the economy by making significant contributions to GDP and growth (Cross & Yusuf, 2020). With a significant move toward automation and electric vehicles, the automotive industry is evolving. In order to effectively meet changing expectations, manufacturers must optimize their supply chains and production processes as consumers and businesses depend more and more on automotive products (Kim et al., 2023). Among other limitations, supply chains face a number of difficulties, including reliance on a small number of suppliers, slow response to unforeseen events, buyer-supplier dynamics, and the channel they use for transactions. The automotive industry is disrupted by these supply chain problems, which makes their goods, services, and procedures more complicated. According to Ernst and Young (2023), the pandemic has had a negative impact on the vast majority of industrial products companies (97%) and the automotive industry. Supply chain managers must adopt a variety of tactics to get past the challenges and reduce and prevent vulnerability. Multiple sourcing is one such tactic. One of the most popular tactics for strengthening supply chains against disruptions is multiple sourcing (Jabberzadeh et al., 2018). Because automotive products are inherently complex and frequently consist of multiple parts, sub-assemblies, and variants, multiple sourcing strategies are necessary. Tight inventory control is encouraged by this tactic. In a multiple sourcing strategy, suppliers compete with one another on price, while key factors like technology, expertise, forecasting, cost, quality, and delivery are retained. Hou, Zeng, and Zhao (2010) assert that although suppliers are crucial to attaining supply chain excellence overall, they are also a significant cause of unpredictability and disturbance. To lower supply risk, they advise buyers to work with multiple suppliers.

From the review of the empirical literature, there is a dearth of research on the relationship between multiple sourcing strategy and operational efficiency in the automotive manufacturing firms. The few available studies are mostly focused on variables different from the one of the current studies. Kimuthia and Amuhaya (2023) studied the influence of sourcing strategies on organizational performance. Munyi, Namusonge and Simiyu (2020) investigated the effectiveness of strategic sourcing for improving firms' performance. Kanyoma, Khomba, Sankhulani, and Hanif (2013) studied sourcing strategy and supply risk management in the healthcare sector. Given the academic relevance of the examination object, the aim of the current study therefore, is to contribute to literature by examining the relationship between multiple sourcing and operational efficiency of automotive manufacturing firms in Nigeria. The specific objectives are to determine the connection between multiple sourcing and:

i) Cost reduction of automotive manufacturing companies in Nigeria
ii) On time delivery of automotive manufacturing companies in Nigeria

1.2 Research Questions of the Study

Based on the stated objectives, the following research questions were put forward:

i. What is the relationship between multiple sourcing and operational efficiency of automotive manufacturing companies in Nigeria?
ii. What is the relationship between multiple sourcing and operational efficiency of automotive manufacturing companies in Nigeria?

2.0 LITERATURE REVIEW

2.1 Concept of Multiple Sourcing Strategy

An organization using a multiple sourcing strategy has business relationships with several suppliers, each of whom responds to the requirements and specifications of a specific quotation from the purchasing organization (Kinuthia & Amuhaya, 2023). One of the most popular methods for strengthening a supply chain's resilience to disruptions is the use of multiple sourcing (Jabbarzadeh et al., 2018). Several suppliers are included in multiple sourcing, also referred to as multi-sourcing strategy. The practice of contracting out services to multiple suppliers, typically in conjunction with some internally supplied components of service delivery, is known as multi-sourcing. By spreading procurement across several suppliers, multiple sourcing reduces risks and increases flexibility (O'Connor, 2022). It lessens dependency on a single source, reducing interruptions from problems like price increases or production delays. Multiple sourcing is used for two primary reasons. Additionally, it lessens reliance on individual suppliers. Other benefits of having competing suppliers include lowering the risk of becoming dependent on a single supplier or locked into a technical solution that may eventually become outdated. For example, Namdar et al. (2018) discovered that multiple sourcing offers a higher quality of service than single sourcing. Reduced supply chain risk, improved quality, and cost effectiveness are just a few benefits of using multiple sourcing (Burke, Carrillo & Vakharia, 2007). Dual or multiple sourcing frequently becomes the favored approach when faced with high demand uncertainty (Burke et al., 2007).
Through vendor competition, multiple sourcing helps the company select the best vendors, reduce costs, and increase agility and adaptability to changing conditions (Bhattacharya et al, 2018). When suppliers experience disruptions and are unable to provide the necessary services and raw materials, a multiple-sourcing strategy becomes even more crucial. It is possible to transfer the supplier's obligations to another supplier if the business is being negatively impacted by frequent supply chain interruptions. Selecting a multi-sourcing approach will guarantee that one is not reliant on a single supplier and can reduce the risks of supply disruption. One obvious strategy to reduce this risk is to use multiple sources (Sarah, 2020). Supply chain managers need to have a thorough understanding of their supplier networks and be able to classify suppliers based on their impact on revenue in the event of a disruption, in addition to their spending patterns. Therefore, multiple-sourcing strategies are frequently the best option in an uncertain manufacturing environment.

2.2 Concept of Operational Efficiency

For businesses to prosper in the fiercely competitive business environment, operational efficiency is a crucial prerequisite (Habib et al., 2022). An internal performance standard is referred to as efficiency. Businesses aim to function as efficiently and productively as possible in the modern world in order to adapt to these dynamic and unstable circumstances and improve their operational performance (Al-Quran et al., 2020). The ability of the business to establish and construct a superior network in response to market demands and product configuration strategies determines its potential for growth or development. The company's product strategy adjusts with the market demand in terms of modifying existing products, developing new or hybrid of the two choices (Sharifi et al., 2013). Modern supply chain performance efficiency is a critical concern for businesses (Wu et al., 2014). Businesses need to efficiently produce their output from inputs in order to thrive.

When assessing a company's performance, efficiency is crucial. It is a crucial component that can be applied to a variety of situations to appraise and analyze the performance of the company. Reduced production costs per unit, higher operating margins, and enhanced profitability are all possible outcomes of efficient operations (Derouiche et al., 2020). Efficiency evaluates cost-effectiveness, productivity, and resource utilization in order to optimize resources and minimize waste. Firms with high operational efficiency will likely perform better in today's competitive markets (Lee et al., 2019). Wu et al. (2014) state that businesses that do not understand the reality of the supply chain's success factors—low costs (supply chain costs), high quality (supply chain reliability), flexibility (supply chain agility), and quick response (responsiveness)—are bound to fail. Industries may perform poorly as a result of inefficient resource use (Habib et al., 2022). Operational efficiency is the basis for cost leadership strategies. The cost leader in any industry is

the one who is capable of producing goods and services similar to those of competitors but at the least cost. This necessitates that the company use the least amount of input to generate a specific level of output. With a significant competitive edge, the cost leader can easily choose to lower prices to the bare minimum needed to stay profitable and gain a bigger share of the market, which will compel rivals to lower their prices as well. Therefore, cost reduction and on-time delivery are used in this study to measure operational efficiency.

2.2.1 Cost Reduction: Cost refers to the aggregate expenditure required to execute particular operations. Koufteros, Lai, and Cheng (2007) defined cost as the aggregate of all expenses, encompassing inbound and outbound freight, warehousing expenses, third-party storage fees, order processing costs, direct labor costs, and administrative and service expenditures. Formulating a strategy focused on cost reduction involves evaluating the following elements: minimizing inventories, optimizing resource usage, enhancing work-in-process inventory turnover, and eradicating non-value-added activities. The predominant and critical metric for assessing the operational supply chain is expected cost. Cost reduction entails the elimination of waste and the enhancement of processes to decrease overhead and/or the cost of goods supplied. The lowering of costs will directly influence profitability, as a firm's efficacy and efficiency are occasionally assessed by its profitability. Kent (2018) asserts that for organizations to operate efficiently, they must implement methods focused on maximizing cost efficiency, necessitating enhancements in supply chain management. Cost reduction is the strategy employed by companies to diminish expenses and enhance profitability. Organizational success is most effectively assessed through cost reduction.

2.2.2 On Time Delivery: Rao, Rao, and Muniswamy (2011) define on-time delivery as the extent to which an organization's products and services fulfill consumer expectations. Delivery performance is characterized by delivery accuracy, delivery reliability, or on-time delivery. Timely delivery, often known as delivery accuracy, is a prevalent metric for assessing Order-to-Delivery performance (Forslund, Jonsson, & Matsson, 2008). On-time delivery signifies that a company can meet its delivery obligations as per the stipulated timeline, referred to as the delivery date. Failure to adhere to this schedule diminishes efficiency, considering that successful on-time delivery necessitates the effective coordination of all involved factors. The delivery process is applicable to both the dispatch of finished items and the incoming delivery of raw materials. (Dey, LaGuardia, & Srinivasan, 2011). The efficacy of delivery performance is fundamentally contingent upon the quality of information disseminated through distribution channels and the manner in which this information is conveyed. Delivery performance can be assessed based on many dates, including Delivery-to-request date and Delivery-to-commit date. Delivery is a crucial factor that enables organizations to maintain their operations and cultivate client trust, which eventually contributes to profitability. The punctual delivery process is an integral component of the supply chain and plays a crucial role in strengthening customer relationships.

2.3 Multiple Sourcing Strategy and Operational Efficiency

Kimuthia and Amuhaya (2023) examined the impact of sourcing strategies on the organizational performance of Muranga cooperative creameries in Kenya. The census technique was employed given the population size, and 76 employees were administered a semi-structured questionnaire using the pick-and-drop method. The study findings indicate that multiple sourcing positively and significantly influences the organizational performance of Muranga cooperative creameries in Kenya. O'Connor (2022) examined the effects of multi-sourcing on management control within the electronic products supply chain in the United States, revealing a significant impact. Multi-sourcing allows buyers to collect essential data for comparing costs and performance among various supply sources, thereby adjusting management controls in accordance with the power dynamics between buyers and suppliers. Munyi, Namusonge, and Simiyu (2020) examined the effectiveness of strategic sourcing in enhancing firm performance. A random sampling technique was employed to obtain a sample size of 375. The findings indicate that effective strategic sourcing enhances firm performance by employing various sourcing strategies and sustaining a manageable supply base. In a similar vein, Yamoah (2020) investigated the effects of strategic sourcing and supplier selection on the operations of Goldfields Ghana Limited. A convenient sampling technique was employed to establish a sample size of 100 respondents. The findings indicate that Goldfields Ghana Limited employs a multiple sourcing strategy, acquiring supplies from both local and international markets. Dede (2018) examined the influence of sourcing practices on procurement performance at the Kenya Bureau of Standards, emphasizing the notable effects of multiple sourcing on delivery time, quality, and product variety. The studies collectively highlight the beneficial impact of multi-sourcing strategies on organizational performance across various industries and regions. Kanyoma et al. (2013) examined the impact of a single sourcing strategy on the exacerbation or mitigation of persistent supply failures within Malawi's public healthcare delivery supply chain. The study utilized stratified random sampling alongside non-probabilistic purposive sampling to achieve a total sample size of 75 respondents. The study's findings indicate that single sourcing increases the risk of supply failure, as demonstrated by ongoing stockouts of medications in hospitals, which jeopardize the lives of numerous patients dependent on the public healthcare system. Based on the findings of previous studies, it can be concluded that the implementation of a multiple sourcing strategy positively impacts the supply chain for automotive companies in Nigeria.

Thus, the study hypothesizes as follows:

$H_{01:}$ Multiple sourcing strategy does not significantly impact cost reduction of automotive manufacturing companies in Nigeria.

$H_{02:}$ Multiple sourcing strategy does not significantly impact on time delivery of automotive manufacturing companies in Nigeria.

3.0 RESEARCH METHODOLOGY

The survey approach was used in this study to ascertain the relationship between multiple sourcing and organizational efficiency. The approach is particularly suited for this study as it enables the researcher to obtain accurate data from respondents on the issue under study. The population for this study comprises the thirty- seven (37) accredited automotive companies operating in Nigeria, obtained from the Nigeria automotive design and development council. A census study was adopted by using the entire population as the sample size. However, three (2) copies of structured questionnaire were distributed to two managers in each of the 37 companies that made up the study population. These managers include the procurement managers, and production managers., as they are knowledgeable about the issues discussed in this study. Therefore, the total respondents for the study will be seventy- four (74) managers. The primary source of data collection is employed in the course of this research study. The structured questionnaire was utilized as the data collection instrument. Reliability test was carried out using the Cronbach Alpha analysis (with values> 0.70). The Pearson Product Moment correlation (PPMC) was used to examine the relationship between the multiple sourcing and the measures of organizational efficiency in the accredited automotive companies operating in Nigeria.

4.0 ESTIMATION OF RESULTS

The findings for the study are presented in this section. Detailed are the univariate data distribution for the variables and the test for the hypothetical statements of the study. From the 74 copies of questionnaire distributed, 71 (96%) copies were successfully retrieved from the field. Out of the retrieved copies (71), 4 copies were observed to have issues, hence only 67 (91%) copies were considered suitable for the analysis.

4.1 Univariate Distribution

The summary distributions for the major variables of the study are presented in this section of the study. The analysis assessed the extent to which the variables, multiple sourcing and organisational efficiency are manifested or expressed within the context of the target organisations.

Table 1: Summary distribution for the variables of the study

		Multiple Sourcing	Cost Reduction	On Time Delivery	Organizational Efficiency
N	Valid	67	67	67	67
	Missing	0	0	0	0
Mean		4.0000	4.2836	3.8742	4.0789
Std. Deviation		.64123	.59032	.68535	.59087
Skewness		-2.075	-2.932	-1.771	-2.308
Std. Error of Skewness		.293	.293	.293	.293
Kurtosis		2.697	7.862	2.072	4.410
Std. Error of Kurtosis		.578	.578	.578	.578

Source: Research Data, 2025.

The line chart above illustrates the summary distribution for multiple sourcing. Evidence from the analysis points to a mean distribution of x = 4.20 for multiple sourcing. This points to the substantiality of views that affirm to the multiple sourcing as a practice, evident in the behaviour of the target organisations. This finding result thus identifies multiple sourcing as clearly evident and as characteristic of the organisations investigated. The specified measures of efficiency are such that comprise of cost reduction (x = 4.2836) and on-time delivery (x = 3.8742), and with both measures summarised to obtain that for organisational efficiency with mean score x = 4.07; indicating that majority of the participants affirm and identify with the position of organisational efficiency as an attribute or feature of their organisations.

4.2 Bivariate Analysis

Presented in this section is the result on the test for the hypotheses on the relationship between multiple sourcing and the measures of organisational efficiency. These comprise cost reduction and on-time delivery. The results are presented on the table 1.

Table 2: Relationship between multiple sourcing and organisational efficiency

		Multiple Sourcing	Cost Reduction	On Time Delivery
Multiple Sourcing	Pearson Correlation	1	.804**	.456**
	Sig. (2-tailed)		.000	.000
	N	67	67	67
Cost Reduction	Pearson Correlation	.804**	1	.715**
	Sig. (2-tailed)	.000		.000
	N	67	67	67
On Time Delivery	Pearson Correlation	.456**	.715**	1
	Sig. (2-tailed)	.000	.000	
	N	67	67	67

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 reveals a correlation coefficient of 0.804** between multiple sourcing and cost reduction, indicating a very strong positive relationship between multiple sourcing and cost reduction. Moreso, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong and statistically significant relationship between multiple sourcing and cost reduction. This further implies that multiple sourcing can be used to achieve cost reduction among automotive companies in Nigeria. Based on this, we reject the null hypothesis that there is no significant relationship between multiple sourcing and cost reduction of automotive companies in Nigeria and accept the alternate hypothesis that there is a very strong, significant relationship between multiple sourcing and cost reduction of automotive companies in Nigeria.

Furthermore, Table 2 reveals a correlation coefficient of 0.456** between multiple sourcing and on time delivery, indicating a moderate positive relationship between multiple sourcing and on time delivery. Moreso, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong and statistically significant relationship between multiple sourcing and on time delivery. This further implies that multiple sourcing can be used to achieve on time delivery among automotive companies in Nigeria. Based on this, we reject the null hypothesis that there is no significant relationship between multiple sourcing and on time delivery of automotive companies in Nigeria and accept the alternate hypothesis that there is a moderate, significant relationship between multiple sourcing and on time delivery of automotive companies in Nigeria.

5.0 DISCUSSION OF FINDINGS

As shown from the results of the correlation analysis with respect to the relationship between multiple sourcing and operational efficiency, it was shown that there is a very strong, positive and statistically significant relationship between multiple sourcing and cost reduction. The results of the correlation analysis with respect to the relationship between multiple sourcing and on time delivery show that there is a moderate positive relationship between the variables. These results imply that multiple sourcing has a significant relationship with operational efficiency in terms of cost reduction and on time delivery. The findings agree with the report that multiple sourcing has a positive and significant influence on organizational performance of cooperative creameries (Kimuthia & Amuhaya, 2023); and that of Kanyoma et al., (2013) that single sourcing exacerbate the risk of supply failure as a result of late delivery.

The current findings also support the result of Namusonge and Simiyu (2020) that the successful implementation of strategic sourcing improve firms' performance through the adoption of multiple sourcing strategies and at the same time maintaining manageable supply base. The findings of the study further corroborate the view that found that current sourcing at Goldfields Ghana is multiple as these suppliers purchase domestically as well as internationally. These findings indicated that an improvement in the multiple sourcing architecture would lead to an improvement in operational efficiency of the automotive companies in Nigeria.

6.0 CONCLUSION AND RECOMMENDATIONS

Based on the presentation and discussion of results, it is concluded that multiple sourcing improves the operational efficiency of automotive companies in Nigeria. This is based on the fact that the indicators of operational efficiency (cost reduction and on time delivery) used in the study in the study relates positively and significantly with multiple sourcing. Multiple sourcing will aid more on reducing ordering, inventory, logistics and delivery cost, at the same time, achieving discounts between the companies and its suppliers. Therefore, it is recommended that managers of the companies operating in the automotive industry must consider diversifying procurement sources to mitigate risks related to supply chain disruptions and supplier insolvencies. By leveraging the presence of multiple suppliers, they can negotiate better terms, prices, and conditions.

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