

SUPPLIER EVALUATION AND SUPPLY CHAIN PERFORMANCE OF ROAD CONSTRUCTION COMPANIES IN RIVERS STATE

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Abstract

This study investigated the correlation between supplier evaluation and supply chain performance of road construction companies in Rivers State. Supplier evaluation was the predictor variable and was treated unidimensionally, while supply chain performance was the criterion variable and was measured with cycle time reduction and productivity. The study adopted an explanatory research design with a correlational investigation type. The study population comprised 29 road construction companies. The study adopted a census method and administered structured questionnaire to project/operation manager, procurement manager, and quality assurance manager of the surveyed firms. Pearson Product Moment Correlation was used to test the hypotheses with the aid of the Statistical Package for Social Sciences (SPSS), version 25.0. The study found statistically significant positive correlation between supplier evaluation and measures of supply chain performance. Thus, the study concluded that supplier evaluation has a significant positive correlation with supply chain performance of road construction companies in Rivers State, and recommends that managers of road construction companies in Rivers State should prioritize supplier evaluation to ensure timely delivery of materials and reduce project cycle time. The study also recommends that managers of road construction companies in Rivers State should use supplier evaluation results to select suppliers that are reliable and competent to enhance productivity and overall performance.

Keywords: Cycle time reduction, productivity, supply chain performance, supplier evaluation

Introduction

The construction industry is crucial to economic development of nations, as it generates significant employment opportunities for both skilled and unskilled workers and contributes to structural development and investment stimulation (Unegbu et al., 2023). Road construction companies are essential in the construction industry, focusing on constructing and repairing roads and bridges, which support transportation and connectivity within communities and regions (Kangwook, 2024). However, the success of these companies depend largely on their supply chains, which ensure timely availability of high-quality materials, equipment and services necessary for project execution (Awaad et al., 2024).

Road construction firms, particularly in Rivers State, struggle to optimize their supply chain, especially when it comes to do with cycle time, cost, and productivity. Delays in material delivery often result in prolonged project timing, leading to increased costs and penalties for missed deadlines (Okoro, 2024). Additionally, poor supplier reliability, delay in delivery, and inefficient procurement processes contribute to cost overruns. Productivity is further hindered by the supply of substandard materials and defective equipment, which leads to rework, wastage, and reduced efficiency on construction sites. These challenges often stem from inadequate supplier evaluation (Awaad et al., 2024; Sakhare, 2024).

Finding suppliers who can deliver the desired quality products at the right time and in the right quantities at an acceptable price, plays a crucial role in enhancing supply chain performance (Wachiuri, 2019). Loppachere et al. (2011) opined that supplier evaluation is important due to companies' increasing reliance on suppliers and their rising involvement in supply chain. The ability of suppliers to meet today's material and service needs is frequently insufficient. Additionally, organizations must assess if a supplier is adequately prepared to meet the long-term demands and specifications of the business (Akintokunbo & Obom, 2021).

Although various studies highlight the importance of supplier evaluation in enhancing supply chain performance, few have examined its specific impact in Nigeria's road construction settings. This study addressed this gap by assessing supplier evaluation and supply chain performance of road construction companies in Rivers State. Fig. 1 provides a conceptual framework for the study.

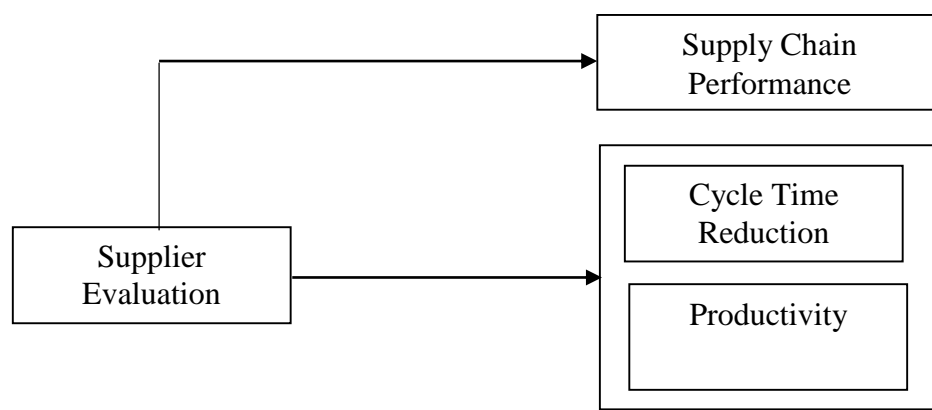


Fig. 1: Conceptual framework of relationship between supplier evaluation and supply chain performance of Road construction companies in Rivers State.

Theoretical Framework

This study is predicated on the total quality management (TQM) theory propounded by Deming in the 1980s as a systematic approach to improving performance through continuous quality improvement (Ngangi & Omwenga, 2018). TQM theory progressed as an approach to quality that it is characterized by systematic, integrated organization-wide plan for enhancing quality of products (Tenner & DeToro, 1992). Deming (1986) based TQM around principles that are necessary for competitiveness in manufacturing and service settings. The theory emphasizes that quality should be built into every stage of production or service delivery.

TQM theory is relevant to this study as it provides a framework for understanding the relationship between supplier evaluation and supply chain performance. The emphasis of TQM on continuous quality improvement, defect prevention, and process efficiency, aligns with the need for effective quality control strategy to ensure that only high-quality materials enter a supply chain (Oppong, 2019). In line with the TQM theory, when companies like road construction companies adopt supplier evaluation, which is a critical quality control strategy, they reduce defects in raw material, reduce cycle time, minimize cost, enhance productivity, and overall supply chain performance (White & Davis, 2016).

Concept of Supplier Evaluation

The growing role and dependence on suppliers among firms has increased the need for objective supplier evaluation (Loppacher et al., 2011). Supplier evaluation is a mechanism for developing and advancing supplier relationships among supply chain partners (Sreejith &

Vinaya, 2017). It is a veritable tool for organizations success, because supply chains encompass all links necessary for conveying a product to final customers, with suppliers forming major links between raw materials, final product design and delivery (Ouko & Juma, 2020; Adiele & Ihunwo, 2022). Supplier evaluation accentuates the need to know if a supplier can guarantee sustained continuity of supply before engaging such supplier in contractual agreement (Kabutura & Mulyungi, 2016).

According to Akintokunbo and Obom (2021), supplier evaluation is the process of evaluating and approving potential suppliers. Sreejith and Vinaya (2017) opined that supplier evaluation refers to the practice of approving and evaluating potential suppliers using quantitative methods to make sure that the best classes of suppliers are made available to supply materials and services to an organization. Onukwulu et al. (2025) defined supplier evaluation as the process of quantifying the efficiency and effectiveness of supplier action. Similarly, Akintokunbo and Obom (2021) defined supplier evaluation as the process of assessing and monitoring suppliers in order to reduce costs and enhance performance.

According to Sreejith and Vinaya (2017) supplier evaluation is one of the activities executed by procurement staff and one whose effective execution determines the success or failure in the supply chain performance. The purpose of supplier evaluation is to compile a list of the best suppliers available (Otieno, & Odero, 2023). Supplier evaluation also involves examining the current suppliers to measure and monitor their performance in order to reduce costs, mitigate risks and drive improvement. In the context of road construction companies, supplier evaluation can help to determine a supplier's ability to supply the required materials that meets the goal of the construction company effectively and efficiently at the right quality and at the right time (Chemjor, 2015).

Supply Chain Performance

According to Inemek and Matthyssens (2013) performance in business measures how well an organization is doing. Supply chain performance determines how efficient and effective an organization achieve its objectives (Opara & Opara, 2016). It encompasses the efficiency and effectiveness of interconnected activities that facilitate the flow of goods, services, and information (Ikegwuru & Harcourt, 2019; Bulsara et al., 2014). Zhang and Okoroafo (2015) define it as capacity of the supply chain to deliver the right product to the right location at the appropriate time at the lowest cost of logistics.

Furthermore, Adiele and Ihunwo (2022) define supply chain performance as ability to meet end-customer needs, associated with ensuring the availability of product, deliver it on time in the right way and ensure appropriate inventory levels. It also exceeds the functional boundaries of organizations, i.e. production, distribution, marketing and sales, research and development. It also refers to the effectiveness and efficiency of a supply chain in delivering products and services. It encompasses metrics that assess resource utilization, competitiveness, and overall operational success within various industries (Lehyani et al., 2021).

Scholars have identified various factors that influence supply chain performance. One of these factors is supplier evaluation (Ngangi & Omwenga 2018; Okoro, 2024). According to Awaad et al. (2024) supplier evaluation impacts supply chain performance as it assesses suppliers' capability to deliver materials timely, in the right quantities, and at the required quality. Similarly, Shi and Zhang (2023) argued that supplier evaluation affects supply chain performance by assessing suppliers' delivery performance, and quality standards, ensuring they meet the construction company's material requirements, ultimately contributing to project

success and maintaining competitive advantage in the market. In this study, cycle time reduction and productivity were adopted as measures of supply chain performance.

Cycle Time Reduction

According to Lathashankar et al. (2018), cycle time refers to the total time it takes for materials and equipment to move through the supply chain. Reducing cycle time is a critical measure of supply chain Performance which refers to the process of decreasing the time required to deliver a product to a consumer by identifying and implementing strategies to reduce cycle times within different parts of the supply chain, such as planning, procurement, manufacturing, logistics, and customer service (Wang et al., 2016). Han et al. (2013) opined that cycle time reduction is cycle involves getting rid of delays, duplication and inefficiency in a process to get faster turnaround times.

More specifically, cycle time reduction in the context of the construction firms refers to the strategies implemented to shorten the duration of construction processes, thereby decreasing project costs and risks. This is particularly crucial in high-rise projects, where efficient scheduling significantly impacts overall timelines (Han & Jong-Dae, 2004). According to Kumbhar et al. (2014) provides tremendous benefit to any manufacturing or construction company. Reducing cycle times makes it possible to respond more quickly to customer demand. In industries like road construction, where timely availability of materials and equipment is crucial, reducing cycle time helps prevent project delays, minimize downtime, and optimize resource utilization (Lathashankar et al., 2018).

Productivity

Productivity is the quantifiable value added by business activities, relative to their costs (Sheth & Sisodia, 2002, as cited in Ateke & Amanagala, 2020). Productivity is a critical measure of supply chain performance because it represents the ratio of output to input in a production process (Sharma & Sharma, 2014). The core focus of productivity is maximizing resource utilization to reduce costs and increase value creation. According to Battisti and Iona (2009), productivity involves achieving maximum possible profit from various resources to enhance societal welfare. Increased productivity is essential to improving living standards. Productivity is typically measured by output over a specific period, relative to the average output.

Productivity is defined as the capacity to generate greater output with limited inputs (Walter & Walters, 2010). It is a key economic metric for both individuals and corporations. It can tell businesses whether they are manufacturing their goods and services efficiently or how well individuals are working to achieve their goals (Sharma & Sharma, 2014). There are a number of ways to increase productivity, including supplier evaluation. Supplier evaluation plays a significant role in influencing productivity in road construction firms by ensuring that a supplier can deliver materials and equipment that meet required standards on time (Awaad et al., 2024; Sakhare, 2024).

Supplier Evaluation and Supply Chain Performance

Empirical literature related to supplier evaluation and supply chain performance exists. Otieno and Odero (2023) examined influence of supplier evaluation practices on supply chain performance of selected Kenyan county governments in Nyanza Region. The study revealed that supplier evaluation practice has positive significant effect on supply chain performance.

Akintokunbo and Obom (2021) on their part, investigated effect of supplier evaluation on supply chain performance of shipping firms in Rivers State. The result show existence of

significant positive relationship between supplier evaluation and supply chain performance of shipping firms in Rivers State. Similarly, Obura et al. (2021) assessed influence of supplier appraisal on procurement performance. The study concluded that firms which practice supplier appraisal gain from improved quality, customer satisfaction, and reduction in acquisition costs.

Also, Ouko and Juma (2020) examined effect of supplier evaluation on procurement performance of private health institutions in Kisumu County. Both descriptive and inferential statistics indicated that all the study's conceptualized variables (supplier quality commitment, supplier financial stability and supplier competence) significantly influenced procurement performance of private health institutions in Kisumu County.

These results substantiate the argument that supplier evaluation enhances supply chain performance. Thus, we hypothesize as follows:

H₀₁: Supplier evaluation does not significantly relate to reduced cycle time in road construction firms in Rivers State.

H₀₂: Supplier evaluation does not significantly relate to productivity in road construction firms in Rivers State.

Methodology

This study examined the relationship between supplier evaluation and supply chain performance of road construction companies in Rivers State. This study adopted an explanatory research design with a correlational method of investigation. The population of the study consisted 29 road construction companies in Rivers State. This study employed a census. However, copies of structured questionnaire were administered to project/operation manager, procurement manager and quality assurance manager of each of 29. To establish validity of the instrument, the questionnaire was subjected to scrutiny by academic and industry experts. Reliability was evaluated through the application of Cronbach's Alpha test for internal consistency. A value of 0.70 or greater validated the reliability of the instrument, signifying that it produces consistent and stable results (Nunnally, 1978). The result of the reliability test is presented in Table 1 below. Pearson Product Moment Correlation (PPMC) was used to test the formulated hypotheses. The probability criterion of a 0.05 significance level was adopted for accepting the null hypotheses at ($P > 0.05$) or rejecting the hypotheses at ($P < 0.05$).

Table 1: Reliability Test - Cronbach's Alpha Analysis

S/N	Variables	Number of Items	Cronbach's Alpha Coefficients
1	Supplier Evaluation	4	0.934
4	Cycle Time Reduction	4	0.787
5	Productivity	4	0.796

Source: SPSS Output of data analyses (2025)

Analysis and Result

Table 2: Descriptive Statistics of Supplier Evaluation

	N	Sum	Mean	Std. Deviation	Variance
Supplier financial capacity is evaluated before engaging suppliers for road construction projects.	74	265	3.58	.759	.576
Supplier commitment to quality standards is considered during supplier selection.	74	289	3.91	.924	.854
Technical competence and industry experience of supplier are assessed prior to awarding contracts.	74	285	3.85	1.043	1.087
Supplier performance is monitored and reviewed using key quality and delivery metrics.	74	272	3.68	1.008	1.017
Valid N (listwise)	74				

Source: SPSS Output of data analyses (2025)

Table 2 revealed that most responses regarding supplier evaluation items are concentrated on the higher end of the Likert scale, which ranges from 1 to 5. Due to this concentration, the mean scores are all above 3.00. Specifically, the question “Supplier commitment to quality standards is considered during supplier selection” had the highest sum of 289 and the highest mean score of 3.91, indicating that this item has the strongest influence on supplier evaluation. Also, the question “Technical competence and industry experience of supplier are assessed prior to awarding contracts” recorded the highest standard deviation of 1.043 and variance of 1.087, showing that responses for this item were more widely spread compared to other questions.

Table 3: Descriptive Statistics of Cycle Time Reduction

	N	Sum	Mean	Std. Deviation	Variance
Timely delivery of road construction projects is ensured.	74	276	3.73	.926	.857
Work stoppages are minimized to enhance overall project speed and efficiency.	74	296	4.00	.828	.685
Procurement lead time is reduced to support timely project execution.	74	299	4.04	.560	.313
Necessary project approvals, permits, and sign-offs are obtained promptly to prevent delays.	74	281	3.80	1.007	1.013
Valid N (listwise)	74				

Source: SPSS Output of data analyses (2025)

Table 3 revealed that most of the responses with respect to cycle time reduction are on the higher side of the Likert scale which ranges from 1 to 5. The mean scores are greater than 3.70. Specifically in the result, question 3 which sought to ascertain the extent to which procurement lead time is reduced to support timely project execution, has the highest sum of 299 and therefore the highest mean score of 4.04. This also indicates that this item has the strongest influence on the variable. Also, question 4 which sought to determine the extent to which necessary project approvals, permits, and sign-offs are obtained promptly to prevent delays, has the highest standard deviation of 1.007 and variance of 1.013, indicating that responses spread most in question 4 compared to other questions.

Table 3: Descriptive Statistics of Productivity

	N	Sum	Mean	Std. Deviation	Variance
Output per labour hour is maximized through workforce efficiency initiatives.	74	295	3.99	.836	.698
Material utilization rates are optimized to reduce waste.	74	273	3.69	.661	.436
The frequency of rework is minimized through quality-focused execution.	74	315	4.26	.703	.495
Project tasks are completed within scheduled timelines while meeting specified quality standards.	74	292	3.95	.949	.901
Valid N (listwise)	74				

Source: SPSS Output of data analyses (2025)

Table 3 shows that most of the responses with respect to productivity are on the higher side of the Likert scale which ranges from 1 to 5. The mean scores are greater than 3.60. Specifically in the result, question 3 which sought to ascertain the extent to which the frequency of rework is minimized through quality-focused execution, has the highest sum of 315 and therefore the highest mean score of 4.26. This also indicates that this item has the strongest influence on the variable. Also, question 4 which sought to determine the extent to which project tasks are completed within scheduled timelines while meeting specified quality standards, has the highest standard deviation of 0.949 and variance of 0.901, indicating that responses spread the most in question 4 compared to other questions.

Table 4: Correlation between Supplier Evaluation and Cycle Time Reduction

		Supplier Evaluation Cycle Time Reduction	
Supplier Evaluation	Pearson Correlation	1	.821**
	Sig. (2-tailed)		.000
	N	74	74
Cycle Time Reduction	Pearson Correlation	.821**	1
	Sig. (2-tailed)	.000	
	N	74	74

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

Source: SPSS Output of data analyses (2025)

In Table 4, it is observed that the correlation coefficient between supplier evaluation and cycle time reduction is 0.821**, indicating a very strong and positive correlation between the variables. Furthermore, the probability value ($p = 0.000$) is less than the critical value of 0.05, demonstrating that the correlation is statistically significant. This suggests that effective supplier evaluation contribute significantly to cycle time reduction among road construction companies in Rivers State. Consequently, the null hypothesis, which states that there is no significant relationship between supplier evaluation and cycle time reduction, is rejected.

Table 5: Relationship between Supplier Evaluation and Productivity

		Supplier Evaluation	Productivity
Supplier Evaluation	Pearson Correlation	1	.866**
	Sig. (2-tailed)		.000
	N	74	74
Productivity	Pearson Correlation	.866**	1
	Sig. (2-tailed)	.000	
	N	74	74

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

Source: SPSS Output of data analyses (2025)

Table 5 indicates a correlation coefficient of 0.866** between supplier evaluation and productivity, suggesting a very strong positive correlation between supplier evaluation and productivity. More so, the probability value ($P = 0.000$) is less than the critical value (0.05), this shows that there is a very strong significant correlation between supplier evaluation and productivity. Based on this, we reject the null hypothesis that there is no significant relationship between supplier evaluation and productivity of road construction companies in Rivers State.

Discussion of Findings

This study assessed the correlation between supplier evaluation and supply chain performance of road construction companies in Rivers State. The tests conducted in the study showed that supplier evaluation has a very strong positive correlation with cycle time reduction and productivity which were used to represent supply chain performance. These findings align with the results of the study of Otieno and Odero (2023) which showed that supplier evaluation management practice has positive significant effect on supply chain performance.

The current findings also corroborate the results of Akintokunbo and Obom (2021) that supplier evaluation has significantly positive correlation with supply chain performance of shipping firms in Rivers State. Similarly, the findings of this study compares with the report that supplier appraisal is a significant predictor of procurement performance (Obura et al., 2021); and that supplier development significantly influence procurement performance (Ouko & Juma, 2020).

Conclusion and Recommendations

In line with the findings of this study and its consistency with the results of previous studies, we conclude that supplier evaluation has positive significant correlation with supply chain performance of road construction companies in Rivers State. Thus, supplier evaluation is a key imperative for improving supply chain performance of road construction firms in Rivers State. Consequently, we recommends that:

1. Managers of road construction Companies in Rivers State should prioritize supplier evaluation to ensure the timely delivery of materials and reduce project cycle time.
2. Managers of road construction companies in Rivers State use supplier evaluation results to select suppliers that are reliable and competent to enhance productivity and overall performance.

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