# Effect of Risk Management Strategies on Supplier Selection at the Lower Benue River Basin Development Authority, Makurdi, Nigeria

## *Efecto de las estrategias de gestión de riesgos en la selección de proveedores en la Autoridad para el Desarrollo de la Cuenca Inferior del Río Benue, Makurdi, Nigeria*

Aondofa Tyozenda
Joseph Sarwuan Tarka University, Nigeria
tyozenda.aondofa@uam.edu.ng
https://orcid.org/0009-0006-9848-3259

Comfort Adadu
Rev. Fr. Moses Orshio Adasu University Nigeria
comfortadadu2019@gmail.com
https://orcid.org/0000-0003-1423-3393

Avanenge Faajir
Rev. Fr. Moses Orshio Adasu University Nigeria
afaajir@gmail.com
https://orcid.org/0009-0001-4580-9546

Date of receipt: September 12, 2025
Date of acceptance: October 21, 2025
Date of publication: November 17, 2025

**This study examined the impact of risk management strategies on supplier selection at the Lower Benue River Basin Development Authority (LBRBDA) in Makurdi. It was motivated by the growing importance of effective supplier selection in public procurement and the need to assess how organizations manage**

**procurement-related risks. The research specifically examined the effects of risk avoidance, risk mitigation, and risk transfer on the supplier selection process. A cross-sectional survey design was employed, utilizing a census approach to cover the entire population of 101 staff members. From the questionnaires distributed, 86 were returned, representing an 85.1% response rate, considered statistically reliable. Data were gathered using structured questionnaires and analyzed using descriptive and inferential statistics, particularly multiple regression. Results indicated that each strategy had a significant positive effect on supplier selection: risk avoidance ($\beta = 0.415$, $p = 0.000$), risk mitigation ($\beta = 0.476$, $p = 0.000$), and risk transfer ($\beta = 0.365$, $p = 0.001$). The study concludes that adopting comprehensive risk management strategies significantly improves supplier selection in public sector procurement. The study recommends institutionalizing structured risk mitigation and avoidance into procurement planning, while strategically applying risk-transfer mechanisms to strengthen supplier reliability and resilience.**

**Keywords: Supplier selection, risk management strategies, public procurement, risk mitigation, risk avoidance, risk transfer, procurement resilience, procurement risk, organizational performance**

Este estudio exploró cómo las estrategias de gestión de riesgos influyen en la selección de proveedores en la Lower Benue River Basin Development Authority (LBRBDA), Makurdi. La investigación fue motivada por la creciente importancia de una selección eficaz de proveedores en la contratación pública y la necesidad de evaluar cómo las organizaciones abordan los riesgos relacionados con la adquisición. El estudio examinó específicamente los efectos de la evasión del riesgo, la mitigación del riesgo y la transferencia del riesgo en la selección de proveedores. Se utilizó un diseño de encuesta transversal, con un enfoque censal que abarcó toda la población de 101 empleados. De los cuestionarios distribuidos, se devolvieron 86, lo que representa una tasa de respuesta del 85,1%, considerada estadísticamente sólida. Los datos se recopilaron mediante cuestionarios estructurados y se analizaron utilizando estadísticas descriptivas e inferenciales, particularmente análisis de regresión múltiple. Los resultados indicaron que cada estrategia tuvo un efecto positivo significativo en la selección de proveedores: evasión del riesgo ($\beta = 0.415$, $p = 0.000$), mitigación del riesgo ($\beta = 0.476$, $p = 0.000$) y transferencia del riesgo ($\beta = 0.365$, $p = 0.001$). El estudio concluye que la adopción de estrategias integrales de gestión de riesgos mejora significativamente la selección de proveedores en la contratación del sector público. Se recomienda que la LBRBDA institucionalice la evasión y mitigación del riesgo de manera estructurada en la planificación de adquisiciones, aplicando estratégicamente mecanismos de transferencia de riesgos para fortalecer la fiabilidad y la resiliencia de los proveedores.

Palabras clave: Selección de proveedores, Estrategias de gestión de riesgos, Contratación pública, Mitigación del riesgo, Evasión del riesgo, Transferencia del riesgo, Resiliencia en la contratación, Riesgo en la contratación, Desempeño organizacional.

## 1. Introduction

Effective risk management is increasingly recognized as a foundational component of modern procurement systems, particularly in the selection of suppliers for large-scale public infrastructure projects. Globally, procurement processes are subject to a range of uncertainties, including supplier failure, market volatility, and geopolitical instability, all of which can jeopardize project delivery (Baldwin and Freeman, 2022). To mitigate these risks, organizations are adopting comprehensive risk management strategies that span the entire project lifecycle—encompassing risk identification, assessment, mitigation, and continuous monitoring. In advanced economies, regulatory frameworks and corporate practices integrate risk management into procurement functions. For instance, the European Union's Directive 2014/24/EU emphasizes transparency, sustainability, and accountability in public procurement (European Union, 2014). Similarly, multinational corporations such as Siemens employ structured risk evaluation tools to assess supplier performance, financial robustness, and ethical compliance, thereby reducing risks of delays and cost overruns (Siemens AG, 2021).

In contrast, developing economies like Nigeria continue to grapple with persistent procurement inefficiencies. Public sector agencies, including the Lower Benue River Basin Development Authority (LBRBDA), often face challenges such as unreliable suppliers, delayed project execution, and limited accountability. Despite reforms introduced through the Public Procurement Act of 2007 aimed at improving transparency and accountability in Nigeria, these challenges remain widespread (World Bank, 2019). Although notable projects, such as the Zungeru Hydroelectric Power Project, have demonstrated the successful application of risk management, systemic gaps in supplier assessment and risk mitigation continue to expose public procurement outcomes to avoidable vulnerabilities (Hydro Review, 2023).

Risk management strategies are structured approaches organizations adopt to identify, evaluate, and control threats that may hinder the achievement of strategic or operational objectives (Gurtu and Johny, 2021). Over time, these strategies have evolved from reactive to proactive systems, emphasizing resilience and foresight. The principal dimensions of risk management include risk avoidance, mitigation, transfer, retention, and sharing (Johnivan, 2024) Each dimension serves a unique purpose in managing procurement uncertainty: risk avoidance eliminates exposure through revised supplier strategies; mitigation reduces the likelihood or impact of risks through preventive mechanisms such as diversified sourcing or contract clauses; transfer shifts risk to third parties such as insurers; retention accepts manageable risks while planning for contingencies; and sharing distributes risks across multiple stakeholders to reduce concentrated exposure (Zsidisin et al., 2004; Tang, 2006).

At the same time, supplier selection remains a critical procurement function that involves evaluating and selecting vendors capable of delivering goods and services in alignment with cost, quality, reliability, and sustainability goals. Definitions of supplier selection emphasize its strategic role in ensuring organizational alignment and procurement performance. Leverick and Cooper (1998), as cited by Englund and Karlsson (2024), argue that effective supplier selection requires a multi-criteria approach that encompasses financial stability, technical expertise, prior performance, and compliance with ethical and environmental standards. In modern procurement, supplier evaluation has become

inseparable from risk management, as organizations strive to minimize disruptions and maximize value for money. Measures such as supplier capacity and historical reliability are increasingly used to assess project suitability (Harvard Kennedy School Government Performance Lab, 2021).

Despite global momentum toward integrated risk-based procurement systems, Nigerian public institutions, such as the LBRBDA, continue to operate with fragmented or underdeveloped supplier assessment mechanisms (Ojo et al., 2024). Project implementation failures in such agencies are often attributed to inadequate risk identification and ineffective supplier vetting procedures. In many cases, political interference, vendor financial instability, and non-compliance with contractual terms undermine procurement outcomes. These issues reveal a significant institutional gap in the application of strategic risk management within supplier selection processes, which this study seeks to address.

While prior studies have explored procurement practices and general risk issues in Nigeria's public sector, there is a limited body of empirical research explicitly focused on how risk management strategies influence supplier selection outcomes within sectoral institutions, such as the LBRBDA. Most available literature focuses on procurement efficiency or reform broadly, without disaggregating the role of specific risk dimensions such as avoidance, mitigation, or monitoring in shaping supplier performance. This leaves a critical gap in understanding how risk-oriented frameworks can be adapted to localized procurement environments, particularly those characterized by weak institutional capacity and high operational risk.

This study, therefore, aims to evaluate the effects of risk management strategies on supplier selection at the LBRBDA. It examines how integrating risk avoidance, mitigation, and continuous monitoring influences supplier-related decision-making and outcomes. Furthermore, the research proposes a contextualized framework to guide risk-based supplier evaluation in public procurement systems, aiming to enhance reliability, efficiency, and sustainability in infrastructure project delivery.

Given the strategic importance of infrastructure development and water resource management in Nigeria, the findings of this study have practical implications for procurement reform and institutional capacity building. By addressing a clearly defined challenge within a major government agency, the research contributes to both the academic literature on risk and procurement and to the practical discourse on enhancing public-sector efficiency in developing economies.

### 1.1. Statement of the Problem

Risk management strategies are central to effective supplier selection in both the private and public sectors of infrastructure projects. These strategies—risk avoidance, mitigation, and transfer—help organizations reduce disruptions, ensure supplier reliability, and achieve value for money. In public institutions such as the LBRBDA in Makurdi, however, recent documentation and interviews with procurement personnel reveal persistent challenges in implementing these strategies effectively.

Procurement records and audit reviews (2022–2024) indicate the absence of structured risk-avoidance frameworks, inconsistent mitigation practices, and limited use of risk-transfer instruments, such as performance bonds and insurance. These weaknesses have led to the engagement of high-risk suppliers, contract delays, and escalating project


360: Revista de ciencias de la gestión, N° 10, 2025 pp. 1-21 / ISSN 2415-5861

costs. Furthermore, findings from key informant interviews indicate that supplier capacity and past performance are not rigorously evaluated, thereby undermining the reliability and efficiency of procurement outcomes.

Although prior studies have examined the general relationship between risk management and supplier performance (Koufteros et al., 2012; Essien et al., 2018; Manavalan & Jayakrishna, 2019; Ojo, Uchenna, & Chidiebere, 2024), empirical evidence on how specific risk management dimensions influence supplier selection within Nigeria's public sector remains limited. This study, therefore, investigates how risk-avoidance, mitigation, and transfer strategies affect supplier selection outcomes at the LBRBDA, with an emphasis on supplier capacity and past performance as key selection criteria.

### 1.2. Objectives of the Study

The primary objective of this study is to examine the impact of risk management strategies on supplier selection at the LBRBDA in Makurdi. The specific objectives are to:

i. Assess the effect of risk avoidance on supplier selection at the LBRBDA in Makurdi.
ii. Evaluate the effect of risk mitigation on supplier selection at the LBRBDA.
iii. Determine the effect of risk transfer on supplier selection at the LBRBDA in Makurdi.

## 2. Literature review

### 2.1. Theoretical Framework

This study is underpinned by Transaction Cost Economics (TCE), a theory introduced by Oliver Williamson (1975; 1981) that provides a useful lens for analyzing how organizations manage procurement risks and select suppliers. TCE posits that firms aim to minimize transaction costs—such as search, negotiation, monitoring, and enforcement—by choosing the most efficient governance structure: market, hybrid, or hierarchy. These choices are shaped by three key variables: asset specificity, transaction frequency, and uncertainty.

TCE rests on several core assumptions:

- Bounded rationality: Decision-makers have limited cognitive ability and incomplete information.
- Opportunism: Parties may act in self-interest with guile.
- Asset specificity: Investments tailored to particular transactions are costly to redeploy.
- Uncertainty: Unpredictable circumstances make governance decisions more complex.

These assumptions are directly relevant to supplier selection and risk management in the public sector. For example, Peng (2020) highlights how behavioral uncertainty increases transaction costs when selecting unreliable suppliers. Poppo & Zenger (2002) extend TCE by integrating relational governance, showing that trust-based supplier relationships can mitigate risk more effectively than formal contracts alone. Similarly, Teece et al. (1997) link

TCE to dynamic capabilities in strategic sourcing, emphasizing the importance of flexibility and learning in supplier partnerships.

While TCE is useful, it has been critiqued for its overemphasis on cost reduction. Critics such as Ghoshal & Moran (1996) argue that it overlooks broader strategic factors, including innovation, organizational learning, and the development of trust-based supplier networks. Its static view of governance structures may also limit its adaptability to dynamic environments.

Nevertheless, TCE remains a valuable theoretical tool in procurement and supplier risk management. It provides a rational framework for deciding whether to avoid, mitigate, transfer, retain, or share risks. For instance, an organization like the LBRBDA might reduce transaction costs and uncertainty by selecting low-risk suppliers with proven capacity or by entering long-term contracts that incentivize reliability. Alternatively, risk transfer mechanisms such as performance bonds or insurance reflect governance strategies predicted by TCE.

In summary, TCE provides a structured framework for optimizing procurement decisions that involve risk, which can be enhanced through effective supplier selection strategies. Its application deepens the analytical depth of this study by connecting theoretical principles to the practical challenges the LBRBDA faces in its procurement operations.

### 2.2. Risk Management Strategies

Risk management strategies are critical frameworks for identifying, assessing, and responding to threats that may impede organizational goals. Scholars emphasize that these strategies should not operate in silos but must align with broader organizational objectives to maintain stability and resilience (Kaplan & Mikes 2016; Hopkin 2018; Bromiley et al., 2015). Increasingly, organizations are adopting proactive and systematic approaches, particularly in sensitive sectors such as water resource management, where effective procurement is crucial to project success (Aven, 2016; Bracci et al., 2024).

At the LBRBDA, risk management strategies include supplier screening, feasibility assessments, contractual risk-sharing, and PPPs (Ameh and Odusami, 2010; Patsanza, 2019; Zou et al., 2007). Despite external challenges such as environmental unpredictability (IPCC, 2022) and regulatory delays (World Bank, 2023), strategic risk management enhances procurement outcomes, sustainability, and resilience (Zavadskas et al., 2010; Holmes et al., 2025).

Kaplan and Mikes (2020) categorize risk responses into core strategies. This study focuses on three strategies—risk avoidance, risk mitigation, and risk transfer—as they most directly relate to supplier-related uncertainties in public procurement.

#### 2.2.1. Risk Avoidance

Risk avoidance entails steering clear of high-risk suppliers or practices based on historical failures, legal noncompliance, or systemic instability. For the LBRBDA, this may involve excluding vendors with poor delivery records or compliance issues. While it enhances

control and reduces uncertainty, overly conservative avoidance may limit access to competitive or innovative suppliers, particularly in dynamic markets.

#### 2.2.2. Risk Mitigation

Risk mitigation aims to minimize the probability and/or impact of supplier risks through proactive measures, including prequalification, performance audits, and environmental assessments. For the LBRBDA, these include contractor vetting and technical assessments. Though risk cannot be eliminated, this approach enhances procurement stability by minimizing disruptions and improving supplier confidence.

#### 2.2.3. Risk Transfer

Risk transfer reallocates exposure to third parties through mechanisms such as insurance, subcontracting, and performance bonds. The LBRBDA may, for instance, use contract clauses that shift financial and operational risks to suppliers or insurers. This requires robust enforcement mechanisms to prevent risk from rebounding due to non-performance or poor oversight.

### 2.3. Supplier Selection

Supplier selection is a strategic procurement function that identifies vendors capable of meeting performance, quality, and risk criteria. Modern selection frameworks go beyond price to evaluate capacity, past performance, compliance, and risk alignment (Ho et al. 2010; Tummala and Schoenherr, 2011). Models such as AHP, TOPSIS (Wind and Saaty, 1980), TCO Panjaitan (2025), and SPE Choy et al (2004) support systematic evaluation.

This study adopts a risk-based supplier selection approach—ideal for public institutions like the LBRBDA—where supplier reliability directly influences project sustainability and cost-efficiency.

#### 2.3.1. Supplier Capacity

Supplier capacity encompasses the operational and financial ability to deliver on contract terms. It includes infrastructure, scalability, and innovation capability (Monczka et al., 2009; Krause et al., 2007; Chopra and Meindl, 2017; Ho et al., 2010). In the LBRBDA context, high-capacity suppliers are those capable of adjusting to complex, large-scale project demands without compromising delivery timelines or quality.

#### 2.3.2. Supplier's Past Performance

Past performance offers a critical benchmark for supplier reliability. Foundational studies by Ondieki et al. (2023) emphasized contract adherence and product consistency, whereas newer insights (Hou et al., 2022; Matas et al., 2024) stress responsiveness and adaptability.

The LBRBDA's supplier evaluation considers not only delivery track records but also responsiveness under stress and compliance with evolving expectations.

### 2.4. Empirical Review

Omoruyi and Quayson (2023) assessed the effect of risk mitigation preferences on supplier commitment and procurement performance in South Africa's public health sector. Their study focused on the interplay between risk-sharing and risk-shifting strategies, employing a quantitative research design with structural equation modeling (SEM) to analyze data from procurement professionals and suppliers. The results indicated a significant positive relationship between risk-sharing strategies and supplier commitment, highlighting that equitable distribution of procurement risks enhances supplier engagement and performance. Furthermore, the study found that a balanced application of risk-sharing and risk-shifting strategies improved overall procurement outcomes by promoting accountability among contracting parties.

In the manufacturing context, Urbaniak et al. (2022) examined supplier evaluation and risk management strategies in Poland. Using a structured CATI survey targeting 151 medium- and large-sized firms, the authors explored risk retention practices. The findings revealed that organizations with established Quality Management Systems (QMS) and Environmental Management Systems (EMS) were more inclined to retain supplier-related risks. These firms leveraged internal compliance structures to manage disruptions rather than transferring risks externally, thereby preserving control over operational uncertainties and maintaining alignment with strategic standards.

Ghadge et al. (2017), in their study titled Using Risk Mitigation: A Buyer-Supplier Power and Dependence Perspective, investigated the role of risk-sharing contracts in managing demand uncertainty and price volatility in the automotive industry. Employing a quantitative approach through integer programming models and an industry-specific case study, the study illustrated how varying buyer-supplier power dynamics affect the efficacy of risk-sharing mechanisms. The findings emphasized that such contracts promote supply chain stability and long-term collaboration, especially when supported by mutual trust and strategic alignment between partners.

Similarly, Sorokina (2016) investigated supplier-related risk in the Russian outsourcing sector. Through expert surveys and algorithmic modeling, the study developed a structured risk-estimation tool to inform outsourcing decisions. The results suggested that firms frequently opted for risk retention, particularly when the perceived risks aligned with their internal capabilities. Organizations with robust monitoring and evaluation competencies were more inclined to internalize supplier risks, reflecting a deliberate and strategic approach to outsourcing under uncertainty.

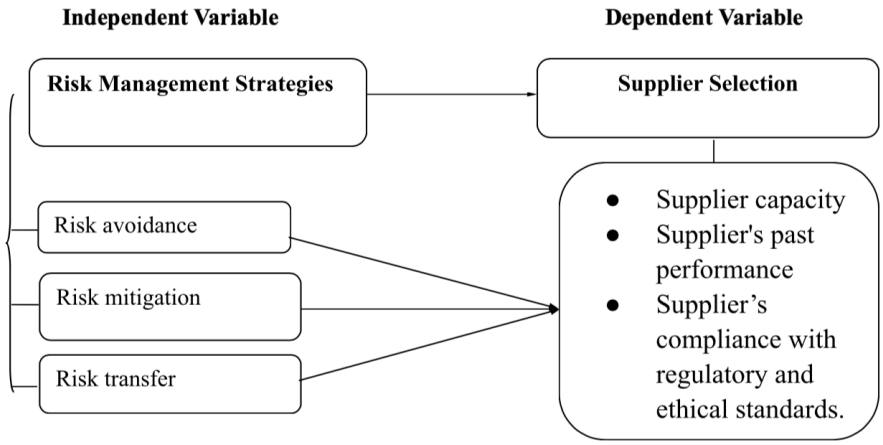
Ho et al. (2015) adopted a holistic perspective in examining supplier selection and risk mitigation across multiple industrial sectors. Using a systematic review methodology, they analyzed prevailing supplier selection frameworks and identified a trend in which firms deliberately retained risks through strengthened internal controls rather than engaging in external risk transfer. Their findings showed that risk retention was often a preferred strategy when firms possessed strong evaluation mechanisms and operational resilience.


360: Revista de ciencias de la gestión, N° 10, 2025 pp. 1-21 / ISSN 2415-5861

In a similar vein, Azadeh and Alem (2010) focused on supply chain risk and vendor selection in Iran's pharmaceutical sector. Their research employed a mixed-methods approach, combining deterministic, stochastic, and fuzzy Data Envelopment Analysis (DEA) to assess vendor risks. Results indicated that pharmaceutical firms tended to retain supplier risks, especially when collaborating with critical suppliers where external risk transfer was cost-prohibitive or ineffective. These organizations managed risk internally through continuous process optimization and enhanced internal oversight.

Together, these studies underscore the nuanced application of risk management strategies—particularly avoidance, mitigation, and transfer—in supplier selection decisions. They demonstrate that strategic alignment, organizational capability, industry context, and the nature of the procurement environment play crucial roles in determining which risk strategies firms adopt. Figure 1 presents the conceptual framework of this study, illustrating the relationships among the independent variables (risk management strategies—risk avoidance, mitigation, and transfer) and the dependent variable (supplier selection), with supplier capacity and past performance as key dimensions.

**Figure 1. Conceptual Framework Showing Independent and Dependent Variables with Their Dimensions**




**Source: own elaboration.**

## 3. Methodology

This study employed a correlational survey design to investigate the effects of risk management strategies—risk avoidance, mitigation, and transfer—on supplier selection at the LBRBDA. A census approach was employed, given the manageable population size of 101 stakeholders, comprising management staff, procurement officers, risk and project managers, and suppliers. Data was collected using a structured questionnaire divided into sections. Section A captured respondents' demographic information, such as role, years of experience, and department. Sections B, C, and D were designed to capture responses on independent and dependent variables based on the study's conceptual framework (see Figure 1). Each construct was assessed using multiple statements adapted from validated

scales in prior studies (e.g., Koufteros et al., 2012; Ho et al., 2015; Ghadge et al., 2017; Ojo et al., 2024; Essien et al., 2018; Manavalan & Jayakrishna, 2019). All items were rated on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), allowing for quantitative measurement of perception strength.

Risk avoidance included items assessing the extent to which the LBRBDA proactively avoids high-risk suppliers or procurement practices. Example items included:

"The Authority excludes suppliers with a record of contractual default," and "Risk assessments are conducted before supplier engagement."

Risk mitigation measured proactive efforts to minimize the likelihood and impact of supplier risks. Sample items included:

"The Authority regularly conducts supplier performance audits," and "Contingency plans are established for critical supply risks."

Risk transfer examined how the LBRBDA reallocates risk to third parties through contracts, insurance, or performance bonds. Example items were:

"Suppliers are required to provide performance guarantees," and "Procurement contracts include insurance or indemnity clauses to manage supplier risks."

Supplier selection (dependent variable) focused on the key criteria used in supplier evaluation and contracting decisions. Items assessed supplier capacity, past performance, and compliance with regulatory and ethical standards. Example statements included:

"Suppliers are evaluated based on technical and financial capacity," and "Past performance influences supplier shortlisting and selection decisions."

Face and content validation were assessed by three experts in procurement and project management to ensure clarity and alignment with the study's objectives. Factor analysis confirmed the instrument's validity (KMO = 0.932; Bartlett's test, $p < 0.000$). Reliability was assessed using Cronbach's alpha values exceeded 0.78, indicating strong internal consistency.

Data were collected through both physical and electronic questionnaires, ensuring respondents' flexibility and convenience. Multiple linear regression was employed to analyze the data, with supplier selection as the dependent variable and risk management strategies as the independent variables. The model was specified as

$$SS = \alpha + \beta 1RA + \beta 2RM + \beta 3RT + \varepsilon \quad \text{Eqn (1)}$$

where,

SS = Supplier Selection

RA = Risk Avoidance

RM = Risk Mitigation

RT = Risk Transfer

$\alpha$ = constant

$\varepsilon$ = error term

with an a priori expectation that all coefficients would be positive. Descriptive statistics summarized demographic data and trends, while inferential statistics, including t-values and p-values at a 5% significance level, tested the hypotheses. A decision rule was established for hypothesis testing, ensuring rigor in assessing the statistical significance of each risk management strategy's effect on supplier selection.

### 3.1. Research Hypotheses

Based on the study objectives and conceptual framework, the following hypotheses were formulated:

$H_{01}$: Risk avoidance has no statistically significant effect on supplier selection at the LBRBDA in Makurdi.

$H_{02}$: Risk mitigation has no statistically significant effect on supplier selection at the LBRBDA in Makurdi.

$H_{03}$: Risk transfer has no statistically significant effect on supplier selection at the LBRBDA in Makurdi.

## 4. Results and discussion

This section presents and interprets the results of the regression analysis conducted to evaluate the effect of risk management strategies—risk avoidance, risk mitigation, and risk transfer—on supplier selection at the LBRBDA. The analysis also serves as the basis for hypothesis testing and for discussing the findings in line with the study objectives.

### 4.1. Model Summary and Goodness of Fit

The Model Summary in Table 1 provides key statistics that help to evaluate how well the regression model fits the data and explains the relationship between the independent variables (risk management strategies) and the dependent variable (supplier selection).

**Table 1. Model Summary**

| Model | R | R–squared | Adjusted R–squared | Std. error of the estimate | Durbin-Watson statistic |
|---|---|---|---|---|---|
| 1 | .887a | .787 | .773 | .251 | 1.812 |

a. Predictors: (Constant), risk transfer, risk mitigation, risk avoidance.

b. Dependent Variable: supplier selection

**Source: Author's Computations using SPSS 2025.**

This analysis is crucial for understanding the effectiveness of the risk management strategies employed by the LBRBDA in shaping its supplier selection process. The first statistic, R (0.887), is the correlation coefficient, which quantifies the strength and direction of the relationship between the independent and dependent variables. A value of 0.887 suggests a very strong positive relationship between the risk management strategies and supplier selection. This indicates that as the LBRBDA employs more effective risk management strategies, its supplier selection becomes increasingly aligned with these practices. A high R-value signals that the risk management strategies play a significant role in shaping the supplier selection decisions at the LBRBDA. The R-square value of 0.787 indicates that approximately 78.7% of the variance in supplier selection is explained by the three risk management strategies employed by the LBRBDA. This means that a large proportion of the variability in how suppliers are chosen can be attributed to risk-avoidance,

risk-mitigation, and risk-transfer strategies. A high R-squared value indicates that the model provides a strong explanation for supplier selection, reinforcing the idea that these strategies are critical to the organization's decision-making process. When considering the adjusted R-squared (0.773), which adjusts the R-squared for the number of predictors in the model, the value of 0.773 indicates that the model maintains a good fit even after accounting for the number of risk management strategies included in the regression. This suggests that the model is not overly complex, and the inclusion of multiple predictors (strategies) still provides a reliable and effective explanation of supplier selection at the LBRBDA. It further highlights the model's robustness and generalizability across different organizational contexts. The Standard Error of the Estimate (0.251) measures the average distance between the observed and predicted values. A relatively small standard error of 0.251 indicates that the regression model's predictions are quite accurate, meaning the model's estimations of supplier selection are close to the actual values. This suggests that the three risk management strategies can be reliably used to predict supplier selection with minimal prediction errors. Finally, the Durbin-Watson statistic of 1.812 lies within the acceptable range (1.5–2.5), indicating that the residuals are independent and that there is no significant autocorrelation. Collectively, these statistics confirm that the model provides a reliable and valid estimation of the relationship under investigation.

### 4.2. Regression Coefficients and Hypothesis Testing

The regression coefficients presented in Table 2 provide essential insights into the relationship between the independent variables (risk management strategies) and the dependent variable (supplier selection).

**Table 2. Regression Coefficients**

| Model | Unstandardized coefficients (B) | Standardized coefficients (Beta) | t | P-Value |
|---|---|---|---|---|
| **(Constant)** | 7.1737 | | 2.244 | .000 |
| **Risk avoidance** | .380 | .415 | 5.429 | .000 |
| **Risk mitigation** | .420 | .478 | 6.462 | .000 |
| **Risk transfer** | .340 | .365 | 4.533 | .001 |

a. Dependent Variable: Supplier Selection

The regression results reveal that all three risk management strategies—mitigation, avoidance, and transfer—significantly influence supplier selection at the LBRBDA. Amongst them, risk mitigation is the most influential risk management strategy affecting supplier selection at the LBRBDA, with a standardized beta coefficient (β) of 0.478. This implies that a one-unit increase in risk mitigation results in a 0.478-unit increase in supplier selection, assuming all other factors remain constant. The strength of this relationship is statistically significant, as indicated by a t-value of 6.462 and a p-value of 0.000, which is significantly lower than the conventional threshold of 0.05, underscoring the robustness of this finding.

This suggests that prioritizing risk mitigation strategies, such as proactive planning and control mechanisms, can substantially improve supplier selection outcomes.

Risk avoidance also exhibits a significant positive impact on supplier selection, with a beta value of 0.415. This indicates that each unit increase in risk avoidance corresponds to a 0.415-unit improvement in supplier selection, assuming other variables are constant. The result is supported by a t-value of 5.429 and a p-value of 0.000, confirming its statistical significance. Although slightly less influential than risk mitigation, risk avoidance remains a critical factor, reinforcing the importance of eliminating potential procurement risks before they materialize.

Risk transfer exhibits the least significant effect among the three strategies, yet it still maintains a positive and significant influence on supplier selection ($\beta = 0.365$, $t = 4.533$, $p = 0.001$). This suggests that measures such as shifting liability through insurance or contracts can contribute meaningfully to supplier evaluation, albeit to a lesser extent than mitigation or avoidance strategies.

These results collectively indicate that risk management strategies play a pivotal role in shaping supplier selection outcomes at the LBRBDA. The positive coefficients further suggest that strengthening institutional frameworks for risk analysis directly contributes to more reliable supplier performance and contract delivery.

4.3 Discussion of Findings

The findings corroborate the assumptions of Transaction Cost Economics (TCE), which postulates that organizations adopt governance structures and risk controls that minimize uncertainty, opportunism, and cost inefficiency (Williamson, 1981; Poppo & Zenger, 2002). The positive effect of risk avoidance and mitigation. confirm that reducing information asymmetry and enforcing contractual discipline lowers transaction costs and improves supplier reliability.

The dominance of risk mitigation in this study aligns with prior empirical findings by Ghadge et al. (2017) and Ho et al. (2015), which highlight that organizations with structured mitigation frameworks demonstrate superior procurement performance and resilience against supplier disruptions. Similarly, Ojo et al. (2024) observed that Nigerian public institutions that integrate risk-based procurement policies experience fewer contract failures and improved transparency in the evaluation of suppliers. Risk avoidance mechanisms, such as rejecting suppliers with poor delivery history, weak financial capacity, or legal noncompliance, help prevent downstream contract failures and project delays in the context of the LBRBDA. This finding aligns with Sorokina (2016), who demonstrated that organizations that prioritize low-risk suppliers tend to achieve higher procurement performance by minimizing operational disruptions. Similarly, Azadeh and Alem (2010) found that firms employing risk-avoidance strategies during vendor selection achieved greater supply continuity and reduced transactional losses. Moreover, Aven (2016) emphasizes that risk avoidance is a critical component of enterprise risk management in complex public projects, as it enables institutions to concentrate resources on trustworthy, technically competent suppliers. Collectively, these studies corroborate that the LBRBDA's emphasis on avoiding unreliable vendors makes a meaningful contribution to procurement efficiency and project success.

Risk transfer, while less influential than avoidance and mitigation, still proved significant, suggesting that contractual and insurance-based mechanisms remain critical in contexts where institutional enforcement may be weak or political risks are prevalent. This finding aligns with Urbaniak et al. (2022), who reported that selective use of risk transfer enhances supplier accountability without undermining collaborative relationships. Omoruyi and Quayson (2023) also confirmed that the balanced application of risk-sharing and risk-transfer tools promotes supplier commitment and reduces disputes in public-sector contracting. From a theoretical standpoint, TCE explains risk transfer as a governance response that redistributes uncertainty to partners best equipped to manage it, thereby lowering transaction costs and safeguarding organizational objectives (Williamson, 1975; Teece et al., 1997).

## 5. Conclusion and recommendations

### 5.1. Conclusion

This study investigated the effect of risk management strategies on supplier selection at the headquarters of the LBRBDA in Makurdi, Nigeria. The analysis confirmed that all three examined strategies—risk avoidance, risk mitigation, and risk transfer—are integrated into the LBRBDA's supplier selection process, and each has a statistically significant and positive influence on supplier selection.

Among these, risk mitigation emerged as the most influential, reflecting the Authority's strong preference for minimizing potential disruptions and ensuring procurement stability. Risk avoidance and risk transfer also demonstrated significant positive effects, particularly in evaluating suppliers with structured risk response mechanisms. This result highlights the crucial importance of proactive planning and control mechanisms, including supplier audits, contingency measures, and performance monitoring, in enhancing supplier reliability and procurement outcomes. While risk avoidance also contributes substantially by eliminating high–risk suppliers and strengthening compliance standards, risk transfer provides additional assurance through contractual and insurance-based instruments that more effectively distribute procurement risks.

Although the overall strength of the relationships was moderate, the findings underscore the growing importance of strategic risk management in public procurement. By incorporating these approaches, the LBRBDA enhances its ability to select reliable suppliers, reduces exposure to supply chain disruptions, and supports more resilient infrastructure development.

### 5.2. Policy Implications

The findings of this study have clear implications for policy and practice at the LBRBDA and other public sector institutions in Nigeria. While the Authority currently applies elements of risk management in procurement, the process remains fragmented. Institutionalizing these practices requires the establishment of structured mechanisms, policy alignment, and ongoing capacity development to ensure their effective implementation. First, the LBRBDA


360: Revista de ciencias de la gestión, N° 10, 2025 pp. 1-21 / ISSN 2415-5861

should develop and adopt a formal Risk Management Framework (RMF) tailored explicitly to supplier selection. This framework should integrate risk identification, assessment, and response planning into each stage of the procurement cycle, including prequalification, evaluation, and contract management. The RMF can be embedded within the Authority's Procurement Manual or Standard Bidding Documents (SBDs) to ensure consistency and enforcement. Second, establishing a Procurement Risk Assessment Committee (PRAC) would operationalize accountability. The committee, comprising procurement officers, internal auditors, and project and risk management experts, should be tasked with reviewing supplier risk profiles, verifying compliance documents, and approving supplier selection decisions based on risk ratings.

Third, the LBRBDA should institutionalize mandatory supplier risk scoring, using a quantitative checklist or an automated tool to evaluate financial capacity, delivery history, regulatory compliance, and safety performance. Only suppliers meeting minimum risk thresholds should be shortlisted. Fourth, capacity-building and training programs should be organized for procurement staff to enhance their competence in applying risk analysis tools, interpreting supplier risk data, and conducting risk-based evaluations. This can be supported through collaboration with the Bureau of Public Procurement (BPP), the Institute of Procurement, Environmental and Social Standards at Joseph Sarwuan Tarka University, Makurdi (IPESS, JoSTUM), and professional associations such as the Chartered Institute of Purchasing and Supply Management of Nigeria (CIPSMN).

Finally, digitalizing supplier risk monitoring through an integrated e-procurement system would improve transparency and data-driven decision-making. Such systems can flag high-risk suppliers, track contract performance, and generate risk intelligence dashboards for management oversight.

By implementing these operational mechanisms, the LBRBDA can move from reactive procurement risk control to a systematic, proactive, and data-informed risk management approach, thereby improving supplier reliability, procurement efficiency, and institutional accountability.

### 5.3. Recommendations

Based on the findings of this study, the following recommendations were made:

i. The LBRBDA should maintain a strong emphasis on selecting suppliers with proven track records of reliability and timely delivery. Suppliers with documented cases of inconsistent performance or contractual breaches should be excluded to reduce the likelihood of procurement-related disruptions.

ii. The LBRBDA should enhance its supplier assessment processes by integrating clear criteria for evaluating risk mitigation capabilities. This includes emphasizing the presence of contingency plans, insurance coverage, and robust risk-sharing mechanisms. During prequalification and tender evaluation, risk mitigation should be treated as a weighted criterion equal in importance to cost and technical competence.

iii. The LBRBDA should develop and disseminate practical guidelines for implementing risk avoidance, mitigation, and transfer strategies. These frameworks could include models for joint ventures (JVs) and public-private partnerships (PPPs), as well as internal contingency planning, to ensure that procurement officers consistently apply risk-based decision-making tools.

iv. Procurement and project staff should be provided to the LBRBDA to enhance their use of modern risk assessment tools, supplier risk profiling, and data-driven evaluation techniques. Partnerships with the Bureau of Public Procurement (BPP), Institute of Procurement, Environmental and Social Standards, Joseph Sarwuan Tarka University, Makurdi (IPESS, JoSTUM), and the Chartered Institute of Purchasing and Supply Management of Nigeria (CIPSMN) can help ensure that capacity development aligns with national and international best practices.

v. The LBRBDA should deploy an e-procurement platform that includes automated supplier risk scoring and contract performance dashboards. Such systems would enable real-time tracking of supplier compliance, financial health, and risk exposure, thereby strengthening the Authority's ability to implement proactive risk mitigation and transfer measures.

### 5.4. Suggested Areas for Further Study

Despite the empirical and methodological strengths of this study, certain limitations constrain its generalizability and contextual depth. First, there is a noticeable reliance on foreign literature and comparative frameworks from developed economies. While these sources provide valuable theoretical insights, they may not fully capture the unique institutional realities, political dynamics, and governance challenges that characterize Nigeria's public procurement environment. Future research should therefore expand the use of local and regional empirical studies, particularly those focusing on the evolving risk management practices of the Nigerian public sector. Second, although this study briefly acknowledges the influence of political interference on procurement outcomes, it does not provide an analytical exploration of how such interference shapes the implementation of risk management strategies at the LBRBDA. Subsequent research should incorporate qualitative approaches, such as key informant interviews and document analysis, to uncover informal norms, bureaucratic bottlenecks, and political pressures that often influence supplier selection and contract administration. Third, the exclusive use of a quantitative design—while methodologically appropriate for testing relationships—limits deeper understanding of the behavioral and institutional dynamics underlying risk management adoption. Future studies could employ a mixed-methods approach that combines survey data with qualitative field insights to provide richer insights into how procurement officers perceive and manage risks in politically sensitive environments. Finally, the analysis could benefit from a more critical engagement with Nigeria's public policy implementation context, contrasting empirical results with on-the-ground realities such as weak enforcement, limited autonomy of procurement officials, and institutional capacity constraints. Exploring these dimensions


360: Revista de ciencias de la gestión, N° 10, 2025 pp. 1-21 / ISSN 2415-5861

would deepen the understanding of why risk management strategies, despite their proven effectiveness, often face implementation gaps in the Nigerian public sector.

Author's role

AT: Conceptualization, Methodology, Software, Formal Analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing and Visualization

CA: Validation, Supervision and Project Administrtion

AF: Validation, Supervision and Project Administrtion

## references


**Ameh, O. J., and Odusami, K. T.**

2010 Professionals' ambivalence toward ethics in the Nigerian construction industry. *Journal of professional issues in engineering education and practice, 136*(1): 9-16.

**Aven, T.**

2016 Risk assessment and risk management: Review of recent advances on their foundation. *European Journal of Operational Research, 253*(1): 1-13.

**Azadeh, A., & Alem, S. M.**

2010 A flexible deterministic, stochastic and fuzzy Data Envelopment Analysis approach for supply chain risk and vendor selection problem: Simulation analysis. *Expert Systems with Applications, 37*(12): 7438-7448.

**Baldwin, R., and Freeman, R.**

2022 Risks and global supply chains: What we know and what we need to know. *Annual Review of Economics, 14*(1): 153-180.

**Bracci, E., Bruno, A., D'Amore, G., & Ievoli, R.**

2024 The integration of performance management and risk management in the public sector: an empirical case. *Journal of Management Control, 35*(1), 137-163.

**Bromiley, P., McShane, M., Nair, A., and Rustambekov, E.**

2015 Enterprise risk management: Review, critique, and research directions. *Long range planning, 48*(4): 265-276.

**Chopra, S., and Meindl, P.**

2016 Supply Chain Management–Strategy, Planning, and Operation 6th Edition.

**Choy, K. L., Bun Lee, W., and Lo, V.**

2004 Development of a case based intelligent supplier relationship management system–linking supplier rating system and product coding system. *Supply Chain Management: An International Journal, 9*(1): 86-101

**Englund, S., and Karlsson Hakala, M.**

2024 Strategic Partnerships in the Automotive Industry Defining Collaboration Approaches in Volvo Cars' Parts Supply and Logistics.

**Essien, E., Lodorfos, G., and Kostopoulos, I.**

2019 Antecedents of supplier selection decisions in the public sector in Nigeria. *Journal of Public Procurement, 19*(1): 15-45.

**European Union.**

2014 Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC. *Official Journal of the European Union*, L 94, 65-242. Retrieved on the 11 January, 2025 from https://eur-lex.europa.eu/eli/dir/2014/24/oj

**Ghadge, A., Dani, S., Ojha, R., and Caldwell, N.**

2017 Using risk sharing contracts for supply chain risk mitigation: A buyer-supplier power and dependence perspective. *Computers & Industrial Engineering, 103*: 262-270.

**Ghoshal, S., and Moran, P.**

1996 Bad for practice: A critique of the

transaction cost theory. *Academy of management Review, 21*(1): 13-47.

**Gurtu, A., and Johny, J.**

2021 Supply chain risk management: Literature review. *Risks, 9*(1): 16.

**Harvard Kennedy School Government Performance Lab.**

2021 "RFP Writing: Evaluation & Selection Criteria." Retrieved 11 February, 2025 from https://govlab.hks.harvard.edu/files/govlabs/files/module_6_rfp_writing_evaluation_and_selection_criteria_gpl_rfp_guidebook_2021.pdf

**Holmes, F., Shukla, M., & Dhurkari, R. K.**

2025 Design of multi-criteria decision framework for supplier evaluation and supply chain sustainability risk (SCSR) management. *British food journal, 127*(5): 1730-1755.

**Ho, W., Zheng, T., Yildiz, H., & Talluri, S.**

2015 Supply chain risk management: a literature review. *International journal of production research, 53*(16), 5031-5069.

**Ho, W., Xu, X., and Dey, P. K.**

2010 Multi-criteria decision-making approaches for supplier evaluation and selection: A literature review. *European Journal of Operational Research, 202*(1): 16-24.

**Hou, Y., Khokhar, M., Zia, S., and Sharma, A.**

2022 Assessing the best supplier selection criteria in supply chain management during the COVID-19 pandemic. Frontiers in Psychology, 12, 804954.

**Hopkin, P.**

2018 *Fundamentals of risk management: understanding, evaluating and implementing effective risk management.* 5th ed. Kogan Page Publishers.

**Hydo Review.**

2023 Units commissioned for the 700 MW Zungeru hydropower plant in Nigeria: retrieved on 11 January, 2025 from https://www.hydroreview.com/africa/units-commissioned-for-the-700-mw-zungeru-hydropower-plant-in-nigeria/

**IPCC.**

2022 Climate Change 2022: Impacts, Adaptation and Vulnerability. Intergovernmental Panel on Climate Change.

**Johnivan, J. R.**

2024 Common types of risk in project management. *Project-Management.com.* Retrieved 17 July, 2025 from https://project-management.com/types-of-risk-in-project-management/

**Kaplan, R. S., & Mikes, A.**

2016 Risk management—The revealing hand. *Journal of Applied Corporate Finance, 28*(1): 8-18.

**Kaplan, R. S., & Mikes, A.**

2020 Managing risks: A new framework. *Harvard Business Review, 90*(6): 48–60.

**Koufteros, X., Vonderembse, M.A. and Doll, W.J.**

2012 Developing and validating measures of manufacturing flexibility and its impact on performance. *Journal of Operations Management, 30*(1-2): 128-145.

## references

**Krause, D. R., Handfield, R. B., & Tyler, B. B.**

2007 The relationships between supplier development, commitment, social capital accumulation and performance improvement. *Journal of operations management, 25*(2): 528-545.

**Manavalan, E. and Jayakrishna, K.**

2019 A review of internet of things (IoT) embedded sustainable supply chain for industry 4.0 requirements. *Computers and Industrial Engineering, 127*: .925-953.

**Matas, J., Perez, N., Ruiz, L., & Riquelme-Medina, M.**

2024 Firm disruption orientation and supply chain resilience: understanding mechanisms to mitigate disruption impact. *Journal of Business & Industrial Marketing, 39*(13): 82-95.

**Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L.**

2009 *Purchasing and supply chain management.* South-Western.

**Ojo, A. K., Uchenna, D. B., & Chidiebere, N. F.**

2024 Risk management in public procurement in the public sector, Cross River State, Nigeria. *American International Journal of Business Management, 7*(12): 232–237.

**Omoruyi, O., & Quayson, M.**

2023 Assessing Risk Mitigation Preference Effect on Supplier Commitment and Procurement Performance in the Public Health Industry in South-Africa.

**Ondieki, M. A., Biraori, O. E., & Priscilla, M.**

2023 Supplier's past performance criteria and its effect on procurement performance in county governments in Kenya. *East African Journal of Business and Economics, 6*(1): 162–174.

**Panjaitan, D. S., Bahagia, N., Raja, A. C. A., & Abduh, M.**

2024 Total cost of ownership factors in procurement and technology economic assessment: A systematic literature review. In *E3S Web of Conferences* (Vol. 484, p. 01022). EDP Sciences.

**Patsanza, E.**

2019 *Mitigating financial risk using construction bonds.* RICS Construction Journal. Retrieved 18 July, 2025 from https://ww3.rics.org/uk/en/journals/construction-journal/mitigating-financial-risk-using-construction-bonds.html

**Peng, G. Z.**

2020 *Toward behavioral transaction cost economics: Theoretical extensions and an application to the study of MNC subsidiary ownership.* Springer Nature.

**Poppo, L., and Zenger, T.**

2002 Do formal contracts and relational governance function as substitutes or complements?. *Strategic management journal, 23*(8): 707-725.

**Siemens AG.**

2021 Corporate Responsibility and Sustainability Report 2021. Retrieved on the 11 January, 2025 from https://plm.sw.siemens.com/en-US/opcenter/quality/supplier-assessment-portal.

## references


**Sorokina, E.**

2016 Modeling and Estimation of the Risk When Choosing a Provider. Published in *Russian Journal of Management Science, 5*(2).

**Tummala, R., and Schoenherr, T.**

2011 Assessing and managing risks using the supply chain risk management process (SCRMP). *Supply Chain Management: An International Journal, 16*(6): 474-483.

**Tang, C. S.**

2006 Perspectives in supply chain risk management. *International journal of production economics, 103*(2): 451-488.

**Teece, D. J., Pisano, G., and Shuen, A.**

1997 Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7): 509-533.

**Urbaniak, M., Zimon, D., Madzik, P., and Širová, E.**

2022 Risk factors in the assessment of suppliers. *Plos one, 17*(8): e0272157.

**Williamson, O. E.**

1975 Markets and hierarchies: analysis and antitrust implications: a study in the economics of internal organization. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.

**Williamson, O. E.**

1981 The economics of organization: The transaction cost approach. *American journal of sociology, 87*(3): 548-577.

**Wind, Y., and Saaty, T. L.**

1980 Marketing applications of the analytic hierarchy process. *Management science, 26*(7): 641-658.

**World Bank.**

2023 *Drivers of delays in procurement of infrastructure projects.* EFI Governance Global Practice, Public Finance and Procurement. https://openknowledge.worldbank.org/handle/10986/40380

**World Bank.**

2019 *Assessment of procurement systems in Nigeria: Benchmarking public procurement 2019.* Washington, DC: World Bank Group.

**Zavadskas, E. K., Turskis, Z., & Tamošaitiene, J.**

2010 Risk assessment of construction projects. *Journal of civil engineering and management, 16*(1): 33-46.

**Zou, P. X., Zhang, G., & Wang, J.**

2007 Understanding the key risks in construction projects in China. *International journal of project management, 25*(6): 601-614

**Zsidisin, G. A., Ellram, L. M., Carter, J. R., and Cavinato, J. L.**

2004 An analysis of supply risk assessment techniques. *International Journal of Physical Distribution & Logistics Management, 34*(5): 397-413