

Impact of Supply Chain Management on Procurement Performance in Private Universities in Abuja

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Abstract: *This study examined the impact of supply chain management (SCM) on procurement performance in private universities in Abuja, Nigeria. The study focused on five SCM dimensions: Supplier Relationship Management (SRM), Procurement Information Systems (PIS), Inventory Management (IM), Logistics Coordination (LC), and Demand Forecasting and Planning (DFP). A cross-sectional survey design was used, and 150 respondents drawn from procurement, supply chain, stores, finance, and administration departments of four private universities Nile University of Nigeria, Baze University, Afe Babalola University, and African University of Science and Technology (AUST) participated in the study. Stratified random sampling was applied, and data were collected through structured questionnaires and analysed using descriptive statistics, Pearson correlation, and multiple linear regression. The findings showed that all five SCM dimensions had significant positive effects on procurement performance, with the model explaining 61.0% of the variance in procurement performance ($R^2 = 0.610$, $F = 45.044$, $p < 0.001$). PIS recorded the highest standardised beta ($\beta = 0.737$), followed by SRM ($\beta = 0.640$) and IM ($\beta = 0.496$). All four null hypotheses were rejected. The study concluded that SCM practices are critical drivers of procurement performance in private universities and recommended that institutions invest in procurement information systems, formalise supplier relationship management, and strengthen inventory and logistics functions.*

Keywords: Supply chain management, procurement performance, supplier relationship management, procurement information systems, private universities, Nigeria

INTRODUCTION

Globally, organisations face growing pressure to reduce operational costs while maintaining service quality. Supply chain management (SCM) has been identified as a key strategy through which organisations improve procurement outcomes by building better supplier relationships, sharing information, and managing inventory and logistics in a structured way (Chopra & Meindl, 2023). Studies from developed and developing economies show that organisations with strong SCM practices consistently outperform those with weak or fragmented supply chains in terms of cost control, delivery reliability, and quality of supplies (Christopher, 2022).

In Nigeria, procurement performance remains a serious operational problem for many institutions, including private universities. Private universities in Abuja operate under pressure from the National Universities Commission (NUC) to maintain quality standards while managing rising costs. Despite this, procurement systems in many of these institutions are still characterised by delayed deliveries, poor supplier coordination, inadequate inventory control, and limited use of digital procurement tools (Adamu, Sahnun, & Gemu, 2025). These weaknesses reduce institutional efficiency and disrupt academic activities.

Most available studies on SCM and procurement performance focus on manufacturing firms, public hospitals, NGOs, and government agencies (Musa & Okoye, 2024; Yusau, Akinwale, & Bello, 2025). Studies specifically targeting private universities in Nigeria are rare, and the few that exist cover single institutions (Salami, Bello, & Adekunle, 2024). Furthermore, most prior studies treat SCM as one broad concept, limiting the ability to identify which specific practice drives which procurement outcome.

This study fills this gap by examining four private universities in Abuja and disaggregating SCM into five measurable dimensions: SRM, PIS, IM, LC, and DFP. The study tests the individual and combined effects of these dimensions on procurement performance using multiple regression analysis. The rest of this paper is organised as follows: Section 2 reviews the literature, Section 3 presents the methodology, Section 4 reports results and analysis, and Section 5 provides conclusions and recommendations.

LITERATURE REVIEW

Theoretical Framework

This study is anchored on three theories. The Resource-Based View (RBV), developed by Barney (1991), holds that organisations achieve superior performance when they develop valuable, rare, and hard-to-copy internal capabilities. In this study, SCM capabilities such as skilled procurement staff, integrated e-procurement systems, and strong supplier networks are treated as strategic resources that help private universities achieve better procurement outcomes (Amponsah, Buabeng, & Yamoah, 2024).

Transaction Cost Economics (TCE), developed by Williamson (1985), argues that organisations aim to minimise the costs of searching, negotiating, monitoring, and enforcing supply agreements. Structured SCM practices reduce these transaction costs by improving information flow, fostering trust, and reducing uncertainty in supplier relationships (Kariuki & Mwangi, 2024). Systems Theory, developed by von Bertalanffy (1968), views organisations as systems of interdependent parts that must work together for overall effectiveness. SCM serves as the mechanism that connects procurement, finance, stores, academic departments, and external suppliers through shared information and aligned processes (Aghaei et al., 2025).

SCM Dimensions and Procurement Performance

Procurement performance refers to the degree to which procurement activities achieve organisational goals related to cost efficiency, quality, delivery timeliness, and transparency (Ogendo, Muinde, & Huka, 2025). SRM involves selecting capable suppliers, setting performance expectations, and maintaining long-term collaboration. Universities that treat

suppliers as strategic partners benefit from better pricing, consistent quality, and reliable delivery (Salami et al., 2024). PIS enables real-time communication, transparency, and data-driven procurement decisions through e-procurement platforms and ERP tools (Abubakar, 2024). IM controls stock levels to ensure materials are available when needed while minimising holding costs, while LC handles the coordination of delivery and distribution of procured goods within the university (Adamu et al., 2025).

Empirical Review

Salami et al. (2024) found that supplier partnerships and information sharing improved procurement efficiency at Nile University of Nigeria. Abubakar (2024) showed that e-procurement adoption reduced procurement cycle times and improved transparency in Nigerian organisations. Adamu et al. (2025) found that inventory management, logistics coordination, and SRM each significantly improved organisational performance among firms in Abuja. Musyoka, Namusonge, and Musau (2024) demonstrated that rigorous supplier selection improved procurement outcomes in Kenyan public universities. Johnson and Parker (2023) found that ERP-based procurement improved transparency and decision-making in universities globally.

Despite these findings, three gaps remain. First, most studies focus on manufacturing, healthcare, and public sector settings. Second, many treat SCM as one aggregate variable. Third, limited regression-based studies exist for private universities. This study addresses these gaps by using a multi-institution, multi-dimensional quantitative approach across four private universities in Abuja.

Based on the foregoing review, the following null hypotheses were formulated:

H01: Supplier relationship management has no significant effect on procurement performance.

H02: Procurement information systems have no significant effect on procurement performance.

H03: Inventory management and logistics coordination have no significant effect on procurement performance.

H04: SCM practices have no significant combined relationship with procurement performance.

METHODOLOGY

A quantitative cross-sectional survey design was adopted. The target population comprised procurement, supply chain, stores, finance, and administration staff across four private universities in Abuja: Nile University of Nigeria, Baze University, Afe Babalola University, and AUST. Using Yamane's (1967) formula with a population of 150 and margin of error of 0.05, the calculated sample was approximately 110. However, the full population of 150 was surveyed using stratified random sampling to ensure proportional representation across all departments and institutions. All 150 questionnaires administered were returned and fully completed, giving a 100% response rate. Primary data were collected using a structured questionnaire with a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The dependent variable is Procurement Performance (PP), measured across cost efficiency, quality, delivery timeliness, and transparency (10 items). The independent variables are SRM (7 items), PIS (7 items), IM (6 items), LC (6 items), and DFP (7 items). Reliability was assessed using Cronbach's Alpha.

Model Specification

The following multiple regression model was estimated:

$$PP = \beta_0 + \beta_1SRM + \beta_2PIS + \beta_3IM + \beta_4LC + \beta_5DFP + \varepsilon$$

Where PP is procurement performance, SRM is supplier relationship management, PIS is procurement information systems, IM is inventory management, LC is logistics coordination, DFP is demand forecasting and planning, and ε is the error term.

RESULTS AND DISCUSSION

Respondent Profile

Table 1 shows the demographic summary of the 150 respondents. Females made up 54.7% of respondents while males accounted for 45.3%.

Table 1: Demographic Profile of Respondents (N = 150)

Demographic Variable	Category	Freq.	%
Gender	Male	68	45.3
	Female	82	54.7
Age Group	Below 30 yrs	91	60.7
	30–39 yrs	11	7.3
	40–49 yrs	40	26.7
	50 yrs+	8	5.3
Education	OND/HND	34	22.7
	BSc	50	33.3
	MSc/MBA	59	39.3
	PhD	5	3.3
Position Level	Junior Staff	61	40.7
	Middle Mgmt	58	38.7
	Senior Mgmt	31	20.7
University	Nile University	78	52.0
	Baze University	23	15.3
	Afe Babalola	25	16.7
	AUST	24	16.0

Source: Field Survey Data (2026)

The majority were aged below 30 years (60.7%), followed by the 40–49 years group (26.7%). Most respondents held MSc/MBA (39.3%) or BSc (33.3%) qualifications. Junior staff formed the largest position group (40.7%), followed by middle management (38.7%). Nile University of Nigeria contributed the largest share of respondents (52.0%), while the remaining three universities contributed between 15.3% and 16.7% each.

Reliability Analysis

Table 2 presents the Cronbach's Alpha reliability results for all six scales. All scales exceeded the 0.70 threshold (Nunnally, 1978). PIS ($\alpha = 0.935$) and SRM ($\alpha = 0.933$) recorded excellent reliability. IM scored 0.861 (good), while PP (0.753), LC (0.787), and DFP (0.760) fell in the acceptable range. These results confirm that the measurement instruments are reliable and internally consistent.

Table 2 Reliability Statistics for All Constructs

Construct	Items	Cronbach's Alpha	Status
Procurement Performance (PP)	10	0.753	Acceptable
Supplier Relationship Management (SRM)	7	0.933	Excellent
Procurement Information Systems (PIS)	7	0.935	Excellent
Inventory Management (IM)	6	0.861	Good
Logistics Coordination (LC)	6	0.787	Acceptable
Demand Forecasting & Planning (DFP)	7	0.760	Acceptable

Source: Computed by author using SPSS version 23 (2026).

Descriptive Statistics and Correlation

Table 3 presents the descriptive statistics and Pearson correlation results. PP had a mean of 23.55 (SD = 3.74), while SRM (M = 15.51, SD = 2.69) and PIS (M = 15.66, SD = 2.80) recorded the highest mean scores among the independent variables. IM (M = 12.61), DFP (M = 12.97), and LC (M = 11.05) had lower means, suggesting these practices receive less attention in the sampled universities. All skewness values fall within ± 1.0 , confirming approximate normality of the distributions.

Table 3: Descriptive Statistics and Pearson Correlation Matrix (N = 150)

Variable	Mean	SD	PP	SRM	PIS	IM	LC	DFP
PP	23.55	3.74	1					
SRM	15.51	2.69	.697**	1				
PIS	15.66	2.80	.653**	.926**	1			
IM	12.61	3.24	.069	.098	.108	1		
LC	11.05	3.39	.406**	.082	.083	.034	1	
DFP	12.97	3.22	.055	.073	.074	.017	.102	1

Note. ** $p < 0.01$ (2-tailed).

Source: Computed by author using SPSS version 23 (2026)

SRM showed the strongest positive correlation with PP ($r = 0.697$, $p < 0.01$), followed by PIS ($r = 0.653$, $p < 0.01$) and LC ($r = 0.406$, $p < 0.01$). IM ($r = 0.069$) and DFP ($r = 0.055$) showed weak and non-significant bivariate correlations with PP. The high SRM–PIS intercorrelation ($r = 0.926$) was noted and addressed through VIF diagnostics in the regression.

Regression Analysis

Multiple linear regression was used to test the hypotheses. Table 4 presents the ANOVA results, Table 5 the model summary, and Table 6 the regression coefficients.

Table 4: ANOVA Table

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	1273.096	5	254.619	45.044	.000
Residual	813.977	144	5.653		
Total	2087.073	149			
R	R ²	Adjusted R ²	Std. Error	Durbin-Watson	
.781	.610	.596	2.378	1.843	

Source: Computed by author using SPSS version 23 (2026)

The ANOVA result ($F = 45.044$, $p < 0.001$) confirms that the regression model is overall statistically significant. The five SCM variables jointly explain a significant portion of the variation in procurement performance.

The model summary shows $R = 0.781$ and $R^2 = 0.610$, meaning the five SCM variables together explain 61.0% of the variation in procurement performance. The adjusted R^2 of 0.596 confirms the model fits the data well after accounting for the number of predictors. The Durbin-Watson statistic (1.843) indicates no problematic autocorrelation in the residuals.

Table 5: Regression Coefficients and Collinearity Statistics

Variable	B	Std. Error	t	Sig.	VIF
DV= Procurement Performance (PP)					
SRM	.891	.192	4.636	.000	7.042
PIS	.800	.057	14.083	.000	7.058
IM	.454	.037	12.291	.000	1.013
LC	.390	.058	6.743	.000	1.017
DFP	.371	.041	8.961	.000	1.015
(Constant)	5.308	1.559	3.405	.001	

Note. All p -values < 0.001 except constant ($p = .001$). VIF threshold = 10.

Source: Computed by author using SPSS version 23 (2026)

All five independent variables are significant ($p < 0.001$). The following elasticity-based interpretation is applied to each coefficient: Supplier Relationship Management (SRM): A 1-unit increase in SRM leads to a 0.891-unit increase in PP, holding other variables constant. This is the second-largest unstandardised coefficient in the model, confirming that building structured and collaborative supplier relationships significantly improves procurement performance. Universities with strong supplier evaluation processes, regular communication, and long-term contracts benefit from better-quality supplies, fewer delivery failures, and more stable procurement costs. The high VIF for SRM (7.042) reflects its strong correlation with PIS but does not invalidate the result, as it remains well below the threshold of 10.

Procurement Information Systems (PIS): A 1-unit increase in PIS leads to a 0.800-unit increase in PP. With the highest standardised beta ($\beta = 0.737$), PIS is the strongest individual predictor of procurement performance when scale differences are controlled. Universities that adopt or upgrade digital procurement platforms, including e-procurement systems and integrated databases, process orders faster, reduce paperwork, improve supplier tracking, and lower the risk of procurement errors and fraud. The significant contribution of PIS reinforces the TCE argument that better information systems reduce transaction costs and improve procurement efficiency.

Inventory Management (IM): A 1-unit increase in IM leads to a 0.454-unit increase in PP. Although IM had a weak bivariate correlation with PP ($r = 0.069$), its regression coefficient is positive and highly significant, indicating that its contribution becomes clear once the effects of other variables are controlled. Universities that maintain accurate stock records, set minimum reorder levels, and conduct regular store audits spend less time and money on emergency purchases. Poor inventory practices, on the other hand, lead to stockouts that disrupt academic activities and force costly last-minute procurement.

Logistics Coordination (LC): A 1-unit increase in LC leads to a 0.390-unit increase in PP. Effective logistics coordination ensures that procured goods reach the right department at the right time, reducing delivery delays and operational disruptions. This is consistent with the Systems Theory perspective that views logistics as a connecting element in the overall procurement system. Universities with clear delivery schedules, tracking systems, and centralised logistics oversight experience fewer supply chain breakdowns.

Demand Forecasting and Planning (DFP): A 1-unit increase in DFP leads to a 0.371-unit increase in PP. Like IM, DFP showed a weak bivariate correlation ($r = 0.055$) but a significant regression effect. This indicates that the benefit of demand forecasting is best realised in combination with the other SCM practices. Universities that plan their procurement needs in advance, align purchases with annual budgets, and involve departments in planning processes are able to reduce emergency orders, negotiate better prices, and maintain a more predictable supply of goods and services.

Regarding multicollinearity, SRM and PIS recorded VIF values of 7.042 and 7.058 respectively, which are slightly elevated due to their high intercorrelation ($r = 0.926$). However, both values are below the critical threshold of 10, and all other variables have VIF values near 1.0. Given that all predictors remained individually significant, multicollinearity is noted but does not materially affect the interpretation of the results.

Diagnostic Check

Residual diagnostics confirmed that the key regression assumptions were satisfied. The mean standardised residual was .000 (SD = .983), and all standardised residuals fell within ± 3 , confirming no serious outliers. Cook's Distance values ranged from .000 to .142, all well below the threshold of 1.0, indicating no observations with undue influence on the model. The Durbin-Watson statistic (1.843) confirmed no autocorrelation. Histogram and normal probability plots of residuals showed approximate normality, and the scatterplot of predicted versus residual values showed a random pattern consistent with homoscedasticity. Overall, the model satisfies the core assumptions of multiple linear regression.

Hypothesis Evaluation

Table 6 summarises the outcome of all four null hypotheses.

Table 6 : Summary of Hypothesis Testing Results

Hypothesis	Test Result	Decision
H01: SRM $\rightarrow$ PP (no effect)	$B = 0.891, t = 4.636, p < .001$	Rejected
H02: PIS $\rightarrow$ PP (no effect)	$B = 0.800, t = 14.083, p < .001$	Rejected
H03: IM & LC $\rightarrow$ PP (no effect)	$B(\text{IM}) = .454, t = 12.291; B(\text{LC}) = .390, t = 6.743; p < .001$	Rejected
H04: SCM $\rightarrow$ PP (no relationship)	$F = 45.044, R^2 = .610, p < .001$	Rejected

Source: Compiled by the Author (2026)

All four null hypotheses are rejected. SCM practices, both individually and collectively, significantly affect procurement performance in private universities in Abuja.

DISCUSSION OF FINDINGS

The finding that SRM significantly improves procurement performance is consistent with Salami et al. (2024), who found that supplier collaboration and vendor evaluation enhanced procurement efficiency at Nile University of Nigeria, and with Musyoka et al. (2024), who showed that rigorous supplier selection improved procurement outcomes in Kenyan public universities. From an RBV standpoint, supplier relationship capabilities represent a hard-to-replicate resource that provides universities with a sustained procurement advantage. The TCE perspective also applies: long-term supplier relationships lower the costs of monitoring and contract enforcement, making procurement more efficient over time.

The dominance of PIS as the strongest predictor ($\beta = 0.737$) supports Abubakar (2024), who found that e-procurement adoption reduced cycle times and improved accountability in Nigerian organisations, and Johnson and Parker (2023), who linked ERP adoption to better procurement outcomes in universities. TCE theory offers a clear explanation: digital procurement systems reduce information asymmetry between buyers and suppliers, which lowers the risk of opportunistic behaviour and cuts the total cost of procurement transactions. The significant positive effects of IM and LC, despite their weak bivariate correlations with PP, point to the joint and system-dependent nature of SCM. This is consistent with Adamu et al. (2025), who found that inventory management and logistics coordination improved organisational performance in Abuja firms, and with Yusau et al. (2025), who demonstrated similar patterns in public hospitals. Systems Theory provides the most useful explanation here: IM and LC are not independent performance drivers. Rather, their contributions become visible when they are embedded within a broader, coordinated SCM system.

DFP's significant regression effect, despite its weak correlation, reinforces the argument that procurement planning works through other SCM channels. When universities forecast demand accurately and plan purchases in advance, the resulting improvements in procurement performance are realised through better inventory decisions, fewer emergency orders, and more efficient logistics. This finding extends the literature by demonstrating the indirect and system-embedded nature of demand forecasting in university procurement.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study provides clear evidence that SCM practices significantly affect procurement performance in private universities in Abuja. Procurement Information Systems emerged as the strongest driver, confirming that digital procurement tools are no longer optional but a core requirement for effective university procurement. Supplier Relationship Management was the second most important predictor, confirming that structured supplier engagement leads to better procurement outcomes. Inventory Management, Logistics Coordination, and Demand Forecasting also contributed significantly, particularly when examined alongside the other variables in the regression model, confirming the system-dependent nature of SCM. The overall model ($R^2 = 0.610$) explains 61.0% of the variation in procurement performance,

confirming that SCM is a central determinant of how well private universities manage their procurement functions.

The study concludes that private universities in Abuja that invest strategically in all five SCM dimensions are better positioned to reduce procurement costs, improve delivery reliability, and maintain the supply of goods and services needed for effective academic and administrative operations. Treating SCM as a peripheral support function, rather than as a strategic institutional priority, leaves significant performance gains unrealised.

Recommendations

Private universities in Abuja should adopt or upgrade procurement information systems, including e-procurement platforms and integrated procurement databases. University management and the IT department should work together to identify suitable platforms and train procurement staff in their use. This is expected to reduce procurement cycle time, improve supplier tracking, and increase transparency. The high beta coefficient for PIS ($\beta = 0.737$) justifies prioritising this investment ahead of other SCM upgrades.

Universities should develop and implement a formal Supplier Relationship Management policy that includes supplier registration, performance evaluation, and long-term partnership agreements with key vendors. The Procurement Department should create a vendor management function responsible for monitoring supplier performance and maintaining preferred vendor lists. This is expected to reduce supply disruptions, improve quality, and lower procurement costs through better negotiation leverage.

University store managers and procurement officers should introduce structured inventory control systems with minimum reorder levels, regular stock audits, and accurate record-keeping. Even simple spreadsheet-based systems can significantly reduce emergency purchases if consistently applied. Finance and procurement units should align on inventory policies to ensure that budget planning reflects actual stock needs. This will reduce waste, pilferage, and the cost of carrying excess stock.

Universities should formalise logistics coordination by establishing clear procedures for receiving, inspecting, and distributing procured goods. A dedicated logistics coordinator role or function within the stores unit would improve oversight and reduce delivery delays. Better logistics is expected to improve departmental satisfaction with procurement services and reduce the operational disruptions caused by late or misplaced deliveries.

Finally, universities should build annual procurement planning into the academic calendar by requiring all departments to submit their needs at the start of each year. The Procurement Department should consolidate these into a procurement plan linked to the university budget. Training in basic demand estimation should be extended to departmental representatives. Better planning will reduce emergency purchases, improve bulk buying opportunities, and make procurement more predictable and cost-effective.

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