International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

Effect of Suppliers Relationship Management Strategies on Bureau of Public Procurement (BPP) and National Petroleum Investment and Management Services (NAPIMS) in Nigeria

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Date of Submission: 01-12-2024 Date of Acceptance: 10-12-2024

ABSTRACT
This work focused on NAPIMS, BPP and Supplier Relationship Management Strategies in Nigeria. Supplier Quality Improvement or SPM, Supplier Lead Time Reduction or SLT, Supplier Collaboration in New Product Development or SCL and Supplier Partnership or Development was recognized in this study as five major categories of Supplier Relationship Management Strategies. Self-developed questionnaires were used in data collection for this study. The study's analysis was based on ordinal regression analysis. Procurement success in Nigerian government agencies was strongly predicted by the following factors: Its types include supplier quality management (SQM), supplier partnership or development (SPT), supplier collaboration in the development of new product (SCL), and trust based relationship with suppliers (TBR). Based on the research, Supplier Relationship Management Strategies enable authorities in Nigeria to enhance their procurement status . This means that the Nigerian National Petroleum Corporation (NNPC) and other branches of the Nigeria government have commenced the use of SRM systems. Therefore, there is a need for government agencies in Nigeria to establish training that promotes constructive relationship between the procurement employees and their suppliers. Long term contracts are a great way to build relationships with providers as well as increase their confidence in you. To provide suppliers with a better understanding of the procurement process and to obtain improved results from collaborative product development projects, it is necessary to develop reference models.

Key Words: Supplier Relationship Management Strategies, supplier collaboration and supplier partnership or development.

I. INTRODUCTION

Supplier relationship management strategies should not be overlooked in the context of this study as a constituent of government procurement. For instance, it facilitates checking that government agencies obtain the greatest value for their brought monies. The most tangible benefits for forging close ties with suppliers include more favorable prices, terms, and conditions and new products and services. Also, supplier relationship management aids in varying risk since communication and relationships with those suppliers are fostered. This minimizes the position that enterprises are in where supply chain is interrupted and do not have the proper inventory of products and services. Last but not least, SRM can enhance innovation as it establishes a work interface between the government and the supplying industry where knowledge exchange takes place regularly. By so doing, there is the creation of new ideas and solutions that solve current problems and existing demands. As such, Supplier Relationship Management forms one of the critical tools that can be adopted by government procurement.

Moreover, because of the role that supplier relationship management strategies play

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even in the Nigerian business environment, they are important too. This is because, in Nigeria especially, the system of public procurement is characterised by corruption, inefficiency and lack of transparency. In fact on the Corruption Perception Index, the Nigerian government has been rated as one of the most corrupt in the world. With the help of implementing the supplier relationship management, it is possible to begin to solve these problems and create a more effective and perspicuous procurement policy in Nigeria. This will in the long run ensure favourable result to both the government and the various people of Nigeria. Hence, there is an opportunity for the government to spend less, avoid wastage and in the end, produce better services to the people. Besides, it can save from the improved procurement and can expand its spending capacity on human capital development, health, and physical capital formation. In general, the analysed strategies of performing supplier relationship management can contribute to the achievement of goals set by the Nigerian government and can enhance the quality of people's lives.

In a bid to ensure that the procurement of goods and services is efficient and credible for the procurement of basic needs the Nigerian government enacted The Public Procurement Act in 2007. As a result of the increased economic growth and human satisfaction, which defines the aims of public procurement, the value for money is the main goal of public procurement.

Oyedele (2015) states that the Act mandates due process for all governmental procurement in Nigeria. To do this, a "NO OBJECTION" certificate must be issued by a public procurement office whose only function is to examine public procurement. As of the date of the Act's enactment, this regulation is binding. Prior to the passage of the Public Purchasing Act in 2007, public procurement in Nigeria was characterised by a dearth of professionalism, inefficiency, and efficacy. This is how things stood prior to the passage of legislation.

Arising from the above, it is expected that both in theory and practice that these policies put in place by successive government should transform the Bureau of Public Procurement (BPP) and the Nigerian National Petroleum Corporation (NNPC) (i.e. the oil and gas industry) and the entire economy of Nigeria. But, a cursory look at the Nigerian economy shows that, perennial underdevelopment, poverty, unemployment, increased debt burden, systematic collapse of infrastructures, unfavourable balance of trade, high rate of corruption, etc. are still prevalent.

When the government makes purchases domestically, it favours vendors in the area, say Bugri, Michael, and Arthur (2019). The local economy might get a lift from this strategy, but it could also lead to inefficient market distortions that limit consumer choice and drive up prices. According to some studies (Bugri et al., 2019), individuals could get more bang for their buck if prices for products and services were to drop as a result of increased competition from international corporations for government contracts. They also think that businesses can make better use of their resources and that government services can be improved through purchasing goods and services through competition.

Despite the passage of the Public Procurement Act, which aimed to enhance the efficiency of the Bureau of Public Procurement (BPP) and the Nigerian National Petroleum Corporation (NNPC), the petroleum sub-sector in Nigeria is not doing effectively. The sub-sector relies on both of these entities. This has been proven correct by recent occurrences. Usman (2011) and Donwa, Mgbame, and Ogbeide (2015) both state that corruption is detrimental to Nigeria's economy and a major issue in the country's oil industry. The discovery that was just mentioned forms the basis of this argument. The oil and gas business in Nigeria is rife with corruption, according to Okafor, Opara, and Adebisi (2020). Given the current state of affairs, this makes sense. Additionally, it was discovered that cheating significantly hinders the growth and advancement of the Nigerian economy. Although it was their responsibility to oversee the country's resources for the benefit of everybody, these investigators discovered that some individuals had stolen a portion of the profits from the Nigerian oil industry.

This observation is further supported by Transparency International (2020) that Nigeria has been perceived as one of the most corrupt country in the world. Available data shows that corruption rank in Nigeria increased from 139 in 2012 to 144 in 2013 and later reduced to 136 in 2014, 2015 and 2016 respectively. It increased to 148 in 2017 dropped to 144 the following year and by 2020 it increased to 149 (Transparency International, 2020).

Most corruption in Nigeria occurs in the petroleum industry, according to Babayomi (2014). According to him, the present laws and regulations governing the oil and gas industry have not

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fostered a favourable environment for the sector to thrive. These include statutes such as the Petroleum Act of 1969, the National Petroleum Corporation Act of 1997, the Petroleum Act of 1969, the Oil and Pipelines Act of 1990, the Petroleum Profit Tax Act of 1959, and the Petroleum Products Pricing Regulatory Act of 2003. The lack of economic prospects in Nigeria has prevented the country from addressing its issues with illegal bunkering, petrol burning, and oil spills.

Matthew (2018) says that the money that Nigeria gets from using oil is what causes officials to be dishonest. This is because more than 75% of the money the government obtains comes from oil sales, and more than 90% of all money made from exports goes to oil. And he went on to say that the "national cake," as the Nigerians describe the money they obtain from oil and gas, is largely distributed and spent by the federal, state, and local administrations of the country. According to him, all the oil sector cheating takes place at the Nigerian National Petroleum Corporation (NNPC), the state-owned oil firm. The National Petroleum Corporation (NNPC) is in charge of establishing the company's policies and procedures, and it lavishly finances itself with no supervision in a manner.

License and contract distribution, operational inefficiencies and bottlenecks, the effect of bunkering, and crude oil exports and refined product imports are the four key areas where corruption may occur in Nigeria's oil and gas sector (Gillies, 2009; Okpan and Njoku, 2019). The purpose of this research is to determine whether and how supplier relationship management strategies influence the efficiency with which government agencies in Nigeria make purchases.

II. LITERATURE REVIEW

2.1.1 Concept of Supplier Relationship Management Strategies

Olendo and Kavale (2016) agree with the aforementioned perspective stating that SRM is a means of procuring information from service or product providers. In our current context and the review conducted by Matunga et al. (2021), SRM comprises numerous practices that seek to capture and meet business needs from suppliers. This work will propose different approaches to optimize the supplier quality, minimize the supplier lead time, build strong bonds with the suppliers, incorporate the suppliers in the product development, and form a partnership or development program with the suppliers as an example of SRM.

2.1.2 Concept of Procurement Performance

Walker and Rowlinson have identified assessment of procurement success as the first step to identifying the positives of a system as well as its weaknesses. Chase et al further state that performance analysis may be viewed either in financial or operational context. I believe that I understand this issue from both angles. Due to the complexity of designing general indices of procurement success, it is necessary to determine specific assessment indicators (Inayatullah, Narain and Singh 2012). This study ranks the effectiveness of procurement using the following criteria: price, transaction costs, product and service quality, and delivery times (Jones and Oliver, 2006; Lysons and Farrington, 2006; Monczka et al., 2005). This data is consistent with other studies' conclusions.

2.2 Empirical Review

In 2014, Al-Abdallah and his colleagues undertook a study to look into how buyer relationship management affected how well manufacturing companies did in the market. Improving supplier quality, establishing trustworthy relationships with suppliers, decreasing supplier lead times, including suppliers in new product development, and fostering supplier partnerships and growth are the five key techniques examined in the study of supplier relationship management (SRM). These routines developed as a result of reading the books. To gauge our level of competitiveness, we consider factors such as price, quality, adaptability, delivery, and rapid product development. By utilising the Statistical Package for the Social Sciences (SPSS) to describe and analyse data from the third round of the High-Performance Manufacturing (HPM) project, which included international data from Japan, Korea, the US, and Italy, the results demonstrate that purchasing firms perform better in the competitive market when they implement two practices of supplier relationship management: supplier partnership/development and supplier lead time reduction. A conclude of this investigation and consequently a discussion of this matter is outlined.

In this case, the extent to which SRM has contributed to the effectiveness of supply chain management in Kenya’s government, particularly in the Ministry of Finance, was the concern of Nyamasege and Biraori (2015). Customer relations, product quality, sources, and suppliers are among the supply chain management (SRM) per the report. The use of descriptive study made it easier to gather both qualitative and quantitative data at the same time. The author contacted all 120

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Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

members of the management team to be involved in the study and later randomly selected 60 volunteers to the study. This paper identified that the different segments, such as suppliers' integration, capability improvement, quality products and services, and customer courtesy had a major influence on the supply chain.

According to research by Jan, Lubbe, Seabelo, and Klopper (2015), banks' performance, particularly their profitability, was stabilised by the advent of information and communication technology. Information and communication technology (ICT), productivity, and cost reductions were all demonstrated in a 2005 study by Kozak, which provided credence to this claim. Research conducted by DiMaggio et al. in 2004 examined the impact of supplier development technologies on the overall performance of pharmaceutical organisations. The study employed a comprehensive method of simultaneous multiple linear regression to determine the dependent variables. This study utilised the 1988 National Longitudinal Study, which was created by the National Centre for Educational Statistics. Gains of three to five percent were seen by companies whose performance had improved. According to research by Li, Jin, Lei, Pan, and Zou (2015), the shipping and production industries require training, technical assistance, parental participation, and effective integration in order to rapidly embrace technology. Purchasing and implementing new technology will not magically improve classroom instruction. For the technology to function, a fully integrated environment and framework are required.

As part of his 2016 audit, Muema examined Sports Kenya's supplier relationship management practices. Examining the impact of these tactics on Sports Kenya's procurement performance was the driving force behind this research. This investigation was based on three theories: the Social Exchange Theory, the Resource Dependency Theory, and the Theory of Dual Economies. The sports organization's purchasing practices and supplier relationship management were examined through a descriptive survey research approach. This strategy combined quantitative and qualitative techniques. According to the results, 25 personnel from the purchasing department and its unit at Sports Kenya made up the target group. Data was collected by surveys, and SPSS was employed for statistical analysis. To display the outcomes, graphs and tables were utilised. To determine the interrelationships of the variables under investigation, regression analysis was employed. Sports Kenya has a comprehensive strategy to monitor its suppliers, according to the study's findings. Additionally, the study found that the method of supplier performance management resulted in the most significant enhancement of purchasing performance. The supplier segmentation method comes next. Sports Kenya has established a convoluted system to classify its service suppliers. To ascertain that all its suppliers are adequately monitored, internal control feature at Sports Kenya has been adopted. Among the parameters considered, the supplier relationship management governance strategy exhibited the highest standard deviation. This demonstrates that this tactic is not always employed by Sports Kenya. Information gathering on prices, quality and assess compliance is done by Sports Kenya. Knowledge management is widely believed and appreciated as an essential factor in training their vendors by Sports Kenya. h the probability of error at 5 per cent and at 95% confidence level, the following strategies; supplier development, supplier segmentation, supplier performance management, and supplier relationship management were important in procurement success. The study therefore suggests that for a maximum profitability of the relationship between Sports Kenya and its suppliers, an appreciation amongst the confined staff in supply chain management and early communication should be encouraged. The importance of supplier governance and growth enabler in the context of the report is also accentuated considering that they are directly connected with procurement success.

Pulles, Schiele, Veldman and Hüttinger (2016), further elaborated on relational mediators that are connected with supply success and collaboration. Therefore, this study was carried out to establish whether developing and sustaining strong partnership relationships requires enhanced financial investment to be worthwhile. To that end, the writers examined the relationship between teamwork and both loyalty and trust, and how these factors are linked with satisfaction and performance. To this end, the authors utilized replies derived from different mailing lists as a means of classifying suppliers and customers. There were discrepancies in the findings from the supplier and customer samples some of which are shown in Table 5 above, nevertheless, the comparative analysis between the two groups yielded the positive findings that trust and commitment enhancements is useful. In this study Nyaga et al. (2010) noted that where commitment and trust is cultivated by the customer or the

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Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

supplier there is a likelihood of a more productive output in a cooperation partnership. A source told the writers that high quality business relationships that are developed through partnership could be potential for influencing organizations' returns in the long run.

Bungoma Town, Kenya's small enterprises were the focus of a 2017 study by Mumelo, Selfano, and Onditi that examined the effects of supplier relationship management (SRM). The research identified SRM by analysing factors such as duration of relationships, frequency of information exchange, and processing time. The participants in the study were from Bungoma Town, Kenya, and they were all employed by SMEs. To select 287 participants, researchers employed a stratified random selection technique. Various primary and secondary sources were used along the process. Findings indicate a favourable correlation between factors including information exchange, lead time, and relationship duration and the organisational success of small firms in Bungoma Town, Kenya. This collaboration was formally announced.

To ensure that public procurement was conducted efficiently and in accordance with applicable laws and regulations, Rockson et al. (2017) examined various supplier relationship management systems. Managing relationships with vendors is a critical aspect of any supply chain. When making purchases, this is something that the majority of government agencies overlook, particularly in countries with underdeveloped economies. Act 663 of 2003, Ghana's Public Procurement Act, addresses numerous procurement matters to provide the business an edge in the long run, resulting in a win-win strategy. However, it fails to address concerns pertaining to supplier relationship management. The purpose of this study was to examine how public tertiary educational institutions may enhance their procurement performance by better managing their relationships with suppliers. The primary results showed that the selected firm uses the popular supplier relationship management strategies to boost procurement efficiency and provide good value for money. But the existing alliances aren't without their flaws. The implications of these findings for management theory and practice are discussed.

In their empirical study, Nkpee and Tamunomiebi (2020) examined the association between managing seller connections and evaluating vendor performance in the Rivers State Bureau of Public Procurement in Nigeria. This study examined the factors using a cross-sectional survey. In order to acquire the first-hand information, a self-administered questionnaire was utilised. For this research, we enlisted the help of forty middle- and upper-level managers from the Rivers State Bureau of Public Procurement in Port Harcourt. In order to locate these individuals, eight separate teams were engaged. Every single person was enumerated in the census due to the large population. The assumptions were tested using Spearman's Rank Order Correlation. The results were presented with a 95% confidence interval, and a significance threshold of 0.05 was utilised for the tests. Research confirmed a correlation between the Rivers State Bureau on Public Procurement's supplier relationship management practices and performance reviews. Improving product performance and cost could be achieved through better supplier relationship management, according to the study. Business resource planning should be implemented by the Rivers State Bureau on Public Procurement, according to the study's findings. As a result, optimising the seller relationship management system and cutting costs will be a breeze. Members of the Rivers State Bureau for Public Procurement can collaborate online.

In order to reduce costs and delays in contract fulfilment, Areguamen et al. (2022) examine the tactics used by procurement managers. Three purchasing managers from private plastics companies in Abuja, Nigeria's Maitama neighbourhood participated in the research. This work was primarily based on Weiss's theory of change. For this purpose, we combed through the company's historical financial records and conducted structured in-person interviews. The facts were typed up and then verified by members, as mentioned in the abstract. Five main points thus surfaced: 1) Strategies for minimising contract overruns and delays; 2) Methods for implementing change; 3) Obstacles to change implementation; 4) Employee considerations; and 5) Strategies for adapting to external circumstances that are always evolving. strategies for making adjustments and strategies for minimising costs and delays when executing contracts were identified as two major challenges by the study. These techniques can be used by company executives who wish to enhance the procurement procedure. They can accomplish this by laying out their long-term objectives and then working backwards to determine the short-term steps that will get them there. Possibilities for constructive societal transformation in Abuja, Nigeria, are high. Among these, there will be fewer societal vices as a result of firms being able to last

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longer, more employment chances for young people, and greater living standards for workers.

In 2023, Ogomegbunam examined the non-financial performance of manufacturing firms. He investigated how supply chain management (SCM) relates to methods of strategic purchasing, partnerships with key suppliers, interactions with customers, and Just-In-Time competency. This research project used a descriptive survey approach. Specifically, as of June 30, 2021, the necessary information was gathered by questioning employees of thirty (30) manufacturing enterprises that were listed with the Corporate Affairs Commission (CAC) and the Manufacturing Association of Nigeria (M.A.N.), Delta State Chapter. Managers and executives from the accounting, customer service, manufacturing, and logistics divisions are the only ones included in the study. Information was retrieved from this group using the entire enumeration selection method. In order to collect data, a questionnaire is utilised. We set out to learn more about the topic at hand. Using descriptive statistics with an alpha level of 0.05, we examined the respondent data to determine the relationships between the independent and dependent variables. The researchers proceeded to put their theories to the test using Pearson Product Moment Correlation. The JIT system and strategic supplier relations, customers, and purchasing strategies of a manufacturing entity determinant its efficiency. Overall, the present study findings suggest that there is a positive relationship between these three aspects. A study done on manufacturing firms in Delta State, Nigeria, showed that all investigated aspects of SCM have an impact on non-financial performance. Among these are Just-In-Time capacity, customer factors, strategic supplier links and strategic purchasing linkages. This suggests that in a corresponding manner, there is expectation that such enhancements of these specific SCM features will produce proportional variation in their non-financial performance. Based on the statistics, the researcher stated that industrial enterprises of Delta State should know the importance of good supply chain management. Manufacturing Association of Nigeria avers that these companies should continue to adhere to these regulations. Using the specified guidelines as a measure, the quality of Nigerian manufacturing can be improved.

Kevin and Odero (2023) investigated the impact of procurement ethics on the connection between the efficiency of supply chains and the way county governments in Kenya manage their relationships with suppliers. Eleven hundred and twenty-two members of the procurement staff participated in this descriptive survey. In this investigation, stratified sampling and basic random sample were both employed. Organised surveys were employed for the purpose of gathering data. A combination of descriptive and inferential statistics were employed to analyse the data. The study found that the relationship between the efficiency of supply chains and the management of relationships with suppliers in certain county administrations in Kenya was significantly impacted by purchasing ethics. This research sheds light on the significance of procurement ethics as a connecting factor between supplier relationship management and supply chain performance delivery. Compliance with procurement regulations is the responsibility of the county administrations. Being forthright, responsible, and truthful are all part of these. Potentially useful information for developing and implementing procurement ethics standards could be found in the data.

III. METHODOLOGY

Population of the Study

The population of this study comprises of four hundred (400) staff from the Bureau of Public Procurement (BPP) (150 staff) and National Petroleum Investment and Management Services (NAPIMS) (250 staff) an arm of NNPC who are real practitioners (https://petrobarometer.thecable.ng/2020/05/25/4780).

Table 3.1 Population Distribution

S/No		Population	% Proportion Selected
1	Bureau of Public Procurement (BPP)	150	37.5 %
2	National Petroleum Investment and Management Services (NAPIMS)	250	62.5%
Total		400	100 % = 400

Source: Researcher's Computation, 2024

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

3.3 Sample and Sampling Technique

Approximately two hundred people working for the BPP and NAPIM at the National Petroleum Investment and Administration Services were picked at random. The methods and processes for public procurement are overseen, managed, and controlled by these entities. Resolving issues with the petroleum industry's public procurement practices is the primary goal of the due process procedure. There were originally two stages to the multistage sampling procedure. The first approach to selecting interviewers was the use of a purposeful sample strategy. In order to determine the sample size from the 400-person community, the second section of the study project utilised the method developed by Taro Yamane (1967). Here is the formula that Taro Yamane developed in 1967:

$n = \frac{N}{1+N(e)2}$

Where;
n =Sample size
N = Population Size
E = Marginal Error (i.e., e = 0.05) at 5 %

The sample size for this study is 200 staff.

There were a total of 220 participants in this study after accounting for a 10% dropout rate, or 20 individuals. The result was a sample size of 220 participants for the research. Bell et al. (2013) found that whereas turnover rates below 5% do not introduce significant bias, rates exceeding 20% significantly impair validity. Bell et al. (2013) add that in order to reduce the possibility of instruments dying or being lost, a 10% increase to the sample size is necessary.

A total of 220 residents in the study area participated in the research. We utilised Bourley's 1964 population allocation approach to determine the size of each sample, ensuring that they were chosen at random. Common ways to describe the process are as follows:

nb = nNb/N
Where;
nb = the sample size for each of the establishment
n = the total sample size
Nb = the number of persons in each of the establishment
N = Total population of the study.
The required individual sample size per each state is calculated proportional as shown in Table 3.2.

Table 3.2 Sample Distribution

S/No		Population	% Proportion Selected
1	Bureau of Public Procurement (BPP)	83	37.5 %
2	National Petroleum Investment and Management Services (NAPIMS)	137	62.5%
Total		**220**	**100%**

Source: Researcher's Computation, 2024

Methods of Data Collection/Instrumentation

Research instruments are the means or tools employed by the researcher for data collection. They include questionnaires, interviews, observations, published materials, inventories and others. The main instrument for this study is Supplier Relationship Management Strategies (SRMSQ). The PPAQ instrument for this study is self-developed into two sections (A and B). Section 'A' measures the socio-demographic information while section 'B' provides responses to questions raised from the research questions.
The response scale for the questionnaire items is structured using modified four rating scale. The four (4) point ratings are: Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2, Strongly Disagree (SD) = 1.

Sources of Data

The data for this study is both primary and secondary sources. The primary data is sourced from questionnaire while the secondary data is obtained from journals, textbooks and articles, etc.

The Model Specification

The model specification will be stated in the functional as follows:
PPG = F(SRM)
(3.1)
Where;
PPG = Procurement Performance in Nigerian Government Agencies (NNPC)
SRM = Supplier Relationship Management Strategies (supplier quality improvement (SPM), supplier lead time reduction (SLT), trust-based relationships with suppliers (TBR), supplier collaboration in new product development (SCL) and supplier partnership or development (SPT)

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

Hence, the functional of the model is stated as follows:

PPG = f(SQM, SLT, TBR, SCL, SPT) (3.2)

The mathematical form of equation (3.1) is stated as follows:

$PPG = \beta_0 + \beta_1 SQM + \beta_2 SLT + \beta_3 TBR + \beta_4 SCL + \beta_5 SPT$ (3.3)

The econometrics form of equation (3.2) is stated as follows:

$PPG = \beta_0 + \beta_1 SQM + \beta_2 SLT + \beta_3 TBR + \beta_4 SCL + \beta_5 SPT + \mu$ (3.4)

Where;

PPG = Procurement Performance in Nigerian Government Agencies (NNPC)

SQM = Supplier quality improvement

SLT = Supplier lead time reduction

TBR = Trust-based relationships with suppliers

SCL = Supplier collaboration in new product development

SPT = Supplier partnership or development

β_0 is the intercept

β_1 – β_5 are the coefficients of independent variables while μ_1 is the error terms.

t = Time period

PPG, SPM, SLT, TBR, SCL and SPT are as earlier defined.

On a priori ground, we expected the following signs of the coefficients of the explanatory variables

$\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$ and $\beta_5 > 0$.

A positive correlation between the dependent variable and each of the explanatory factors is anticipated, according to the signs of the given parameter values.

3.8 Statistical Tests or Method of Data Analysis

The Statistical Package for the Social Sciences (SPSS) was used to examine the outcomes of this research. When analysing the obtained data, descriptive and inferential statistics are both necessary. Descriptive statistics included percentages, means, and frequency rates. The purpose of this data analysis is to examine the respondents' socioeconomic backgrounds and identify significant elements numerically. In order to evaluate the assumptions of Supplier Relationship Management Strategies on the procurement performance in Nigerian government agencies, we used the ordinal regression analysis and other inferential statistics.

Ordinal Regression

In measuring the efficiency of procurement as it relates to Supplier Relationship Management Strategies of Nigerian government agencies, the research in an attempt to analyze the results deployed the ordinal regression method. The study project prefer this ordinal regression method because it has many advantage such as linearity, unbiasedness, low variance, efficiency and lowest mean scores.

In terms of analysis in this research study, the Statistical Package for the Social Sciences more commonly known as SPSS shall be used. The experiments that were conducted are detailed below:

1. **Model Fitting Information test:** The model fitting information is a statistical test that tells us how well the model fit the data.
2. **Goodness of fit test:**The "Goodness of Fit" section contains the Pearson and Deviance chi-square tests. If you want to know if a model is good for you, read some reviews. The lack of statistical significance in the test results indicates that the model well fits the data.
3. **Pseudo R-square:** In the Pseudo R-square we concentrate on the Nagelkerke. The Nagelkerke is more like the R-square in the linear regression.
4. **Test of Parallel Lines:** The Test of Parallel Lines is a diagnostic test commonly used in ordinal regression analysis, particularly when using proportional odds models. Its primary purpose is to assess the assumption of proportional odds or parallel lines.
5. **Parameter Estimates:** The Parameter Estimates looked at the ordinal regression coefficient for interpretation. It explains the effect of the explanatory variable(s) on the dependent variable.

IV. DATA ANALYSIS AND INTERPRETATION

Regression Analysis

In other to carry out the regression analysis, we first conduct the test of normality. The test of normality guides us on the method to be used. From the result of the test of normality, if the data used are normality distributed, then we will carry out linear regression and Pearson Correlation but if the data used are not normality distributed, then we carry out Ordinal Regression and Spearman Correlation.

Also, there are two tests of normality, Kolmogorov-Smirnov and Shapiro-Wilk. If the sample size is less than 100 (i.e. $n < 100$), we will use Shapiro-Wilk but if the sample size is greater

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

than 100 (i.e. n > 100), we will use Kolmogorov-Smirnov. The result of the test of normality is presented in Table 4.1.

4.1: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SQM	.099	215	.000	.960	215	.000
SLT	.117	215	.000	.951	215	.000
TBR	.148	215	.000	.912	215	.000
SCL	.177	215	.000	.856	215	.000
SPT	.131	215	.000	.885	215	.000
PPG	.170	215	.000	.852	215	.000

Source: Researcher's Computation, 2024

From Table 4.1, the result of the test of normality shows that the data used are not normality distributed, hence, we will carry out Ordinal Regression and Spearman Correlation. This is shown by the probability values of 0.000 for SQM, 0.000 for SLT, 0.000 for TBR, 0.000 for SCL, 0.000 for SPT and 0.000 for PPG which are statistically significant. Since the number of observations is greater than 100, that is, the number of observations for this study is 426, and the variables used are not normality distributed, we proceed by carrying out a confirmation test by logging the variables and run test of normality again. The result of the logged variables of the test of normality is presented in Table 4.2.

4.2: Tests of Normality of Logged Variables

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LOG_SQM	0.099	215	0.000	.960	215	0.000
LOG_SLT	0.117	215	0.000	.951	215	0.000
LOG_TBR	0.148	215	0.000	.912	215	0.000
LOG_SCL	0.177	215	0.000	.856	215	0.000
LOG_SPT	0.131	215	0.000	.885	215	0.000
LOG_PPG	0.170	215	0.000	.852	215	0.000

Source: Researcher's Computation, 2024

From Table 4.2, the result of the logged test of normality shows that the data used are not normality distributed, hence, we will carry out Ordinal Regression and Spearman Correlation. This is shown by the probability values of 0.000 for Log_SQM, 0.000 for Log_SLT, 0.000 for Log_TBR, 0.000 for SCL, 0.000 for SPT and 0.000 for Log_PPG which are not statistically significant. Since the number of observations is greater than 100, that is, the number of observations for this study is 426, and the variables are not normally distributed we proceed by carrying out the Ordinal Regression and Spearman Correlation.

Analysis of the Ordinal Regression Model

The Model Information for the Model

The data collected during fitting the model is displayed in Table 4.3. The statistical test that displays the model's information reveals the degree to which the model matches the data.

Table 4.3: Model Fitting Information for the Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1111.529			
Final	773.300	338.229	5	0.000

Source: Researcher's Computation, 2024

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

The statistical test that this information represents checks how well the model matches the data. This is known as the model fitting information. This model's information value is 0.000, which is less than the 0.05 level of significance, as shown in the table. This is something that can be seen. This means that the facts about fitting the model is statistically important. From this study, it looks like the model fits the data really well.

Goodness-of-Fit for the Model
The result of the Goodness of fit is presented in Table 4.4.

Table 4.4: Goodness-of-Fit for the Model

	Chi-Square	df	Sig.
Pearson	8997.137	2598	0.541
Deviance	764.816	2598	0.967

Source: Researcher's Computation, 2024

The "Goodness of Fit" section contains the Pearson and Deviance chi-square tests. These evaluations can be useful when deciding whether a model is suitable. A good indicator that the model adequately fits the data is the absence of statistical significance in the test results. It is reasonable to conclude that the model provides a good fit to the data as neither the Pearson nor the Deviance tests yielded statistically significant results. The reason for this is that both the Pearson index and the Deviance index above the significance level of 0.05. Both the Deviance and the Pearson score are 0.967 and 0.541, respectively. It is evident that there is a strong alignment between the model and the reality.

Pseudo R-Square for the Model
The result of the Pseudo R-square is presented in Table 4.5.

Table 4.5: Pseudo R-Square for the Model

Cox and Snell	0.793
Nagelkerke	0.797
McFadden	0.299

Source: Researcher's Computation, 2024

It is the Pseudo R-square that the Nagelkerke mostly highlights. Compared to R-square, the Nagelkerke is more commonly used in linear regression. The Nagelkerke number is 0.797, which is identical to this. The government's control over these factors is limited, so 79.7 percent of the variation in the effectiveness of procurement by Nigerian government agencies can be explained by factors outside of government control, such as SQM, shorter lead times, trusting relationships with suppliers, collaboration with suppliers on new products, and supplier partnerships or development. What remains, accounting for variables not included in the model, is the error component, which accounts for 20.3% of the discrepancy.

Test of Parallel Lines for the Model
The result of the Test of Parallel Lines is presented in Table 4.6.

Table 4.6: Test of Parallel Lines for the Model

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	773.300			
General	0.000[b]	773.300	90	0.369

Source: Researcher's Computation, 2024

The Test of Parallel Lines is a common diagnostic tool in logistic regression analysis, particularly for models with proportional odds. The primary objective is to test the validity of the assumption that normal distributions have proportional or linear odds. Assuming this to be true, we can expect the factor-outcomes-log-odds relationship to be constant across all levels of the outcome variable.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

The premise upon which ordinal regression rests is that the impact of the predictor variables on the outcome variable is uniform across all levels or categories. By so ensuring, we ensure that the study gets accurate results by eliminating inconsistencies in results. This suggest that the coefficients, that is, the slopes of the predictors are invariant across the levels of the outcome variable.

This assumption can also be proved by using Test of Parallel Lines. This is done by using coefficients of the predictor factors to analyze several ordinal outcome variables to determine any variance.

The assumption when working with the test of parallel lines is then if the obtained p-value is not significant, commonly follows a value more than the chosen significance level such as 0.05. The current analysis does not provide any reason to believe that the predictors' effects differ from one outcome value to another. This is because there is no evidence for its existence.

When the value of the p – statistic is large then this could make sense that the parallel lines assumption is wrong since it's violated in this case.This implies that the strength of the relationship of the and the predictors' with the outcome variable may also differ. More investigation is required to cover this possibility. Here you can look at other models for example those with partial proportional odds where the log odds ratio varies across categories but slightly away from the parallel lines assumption.

If this issue is not dealt with then, there is a risk that the assumption which underpins the ordinal regression model - parallels – have been broken and predictions derived from the model are going to be imprecise. In this respect, lies the rubbed off possibility of bias in the model's result. Therefore, before making any modifications to the model, make sure to thoroughly review the Test of Parallel Lines results. When doing ordinal regression analysis, the Test of Parallel Lines is a crucial tool for identifying issues. The primary objective is to verify the accuracy of the proportionate chance assumption.

Table 4.6 displays the results of the tests, which confirm the continued validity of the proportionate odds theory. With a probability of 0.369, we surpass the predetermined 0.05 level of significance. Looking at the parameter estimate is the next step.

Parameter Estimates for the Model

The result of the Parameter Estimates is presented in Table 4.7. Here we look at the ordinal regression coefficient for interpretation.

Table 4.7: Parameter Estimates for the Model

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[PPG = 1.22]	6.841	1.730	15.641	1	.000	3.451	10.232
	[PPG = 1.44]	11.148	1.475	57.124	1	.000	8.257	14.039
	[PPG = 1.56]	11.554	1.480	60.952	1	.000	8.653	14.455
	[PPG = 1.67]	12.307	1.497	67.617	1	.000	9.374	15.240
	[PPG = 1.78]	12.537	1.504	69.523	1	.000	9.590	15.484
	[PPG = 1.89]	12.767	1.511	71.365	1	.000	9.805	15.729
	[PPG = 2.00]	12.993	1.519	73.135	1	.000	10.015	15.971
	[PPG = 2.22]	13.744	1.549	78.753	1	.000	10.709	16.780
	[PPG = 2.33]	14.878	1.596	86.925	1	.000	11.750	18.005
	[PPG = 2.44]	15.225	1.610	89.464	1	.000	12.070	18.380
	[PPG = 2.56]	15.578	1.624	92.010	1	.000	12.395	18.761
	[PPG = 2.67]	16.912	1.683	100.950	1	.000	13.613	20.211
	[PPG = 2.78]	17.840	1.724	107.130	1	.000	14.461	21.218
	[PPG = 2.89]	18.536	1.753	111.820	1	.000	15.100	21.971
	[PPG = 3.00]	19.107	1.776	115.719	1	.000	15.625	22.588
	[PPG = 3.11]	19.943	1.810	121.378	1	.000	16.395	23.491
	[PPG = 3.22]	20.954	1.852	128.057	1	.000	17.325	24.583
	[PPG = 3.33]	22.536	1.914	138.690	1	.000	18.785	26.286

International Journal of Advances in Engineering and Management (IJAEM)
Volume 6, Issue 12 Dec. 2024, pp: 51-65 www.ijaem.net ISSN: 2395-5252

	[PPG = 3.44]	24.537	1.976	154.181	1	.000	20.664	28.410
Location	SQM	.022	.401	.003	1	.957	-.765	.809
	SLT	.295	.276	1.141	1	.285	-.247	.837
	TBR	.882	.359	6.032	1	.014	.178	1.585
	SCL	.773	.320	5.845	1	.016	.146	1.400
	SPT	4.487	.438	104.815	1	.000	3.628	5.346

Source: Researcher's Computation, 2024

Supplier quality improvement (SQM)was an insignificant positive predictor of Procurement Performance (PPG) in Nigerian Government Agencies. This indicates that for every unit improvement in Supplier Quality Improvement (SQM), the likelihood of achieving a higher level of Procurement Performance (PPG) in Nigerian government agencies is anticipated to increase by 0.022. The connection between the two solutions proves this. Negligible positive predictor status is warranted since the probability number of 0.957 exceeds the 0.05 significance level.

Nigerian government offices viewed supplier lead time reduction (SLT) as a positive metric of procurement performance (PPG), notwithstanding the lack of statistical significance. If supplier lead time reduction (SLT) is improved by one unit, the likelihood of better Procurement Performance (PPG) in Nigerian government agencies increases by 0.285. Supply chain lead time (SLT) is a measure of how quickly suppliers are reducing their lead times. Since the probability value of 0.285 exceeds the significance level of 0.05, it is not a very important good predictor.

Successful procurement in Nigerian government agencies was strongly correlated with TBR, or trust-based relationships with suppliers. If the number of trust-based relationships with sellers (TBR) increases by one unit, the probability of improving procurement performance (PPG) in government agencies in Nigeria will improve by 0.882. TBR is a method for determining a service's dependability. Positive predictive significance is assumed due to the fact that 0.014 is lower than the significance level of 0.05.

Government agencies in Nigeria saw a significant and positive impact on their procurement performance (PPG) from the amount of supplier involvement in new product development (SCL). If more suppliers are involved in the process of developing new products for Nigerian government agencies, the likelihood of achieving a high Procurement Performance Grade (PPG) increases by 0.773% every extra unit of supplier involvement. Working with suppliers to create new goods is an integral part of SCL for this reason. It is deemed a significant excellent predictor because 0.016 is lower than the significance criterion of 0.05.

A significant predictor of successful procurement in Nigerian government agencies was supplier partnership or development (SPT). This indicates that for every unit improvement in supplier partnership or development (SPT), the likelihood of achieving a better level of Procurement Performance (PPG) in Nigerian government agencies is anticipated to rise by 4.487%. Because of the connection between the two, this is evident. Its 0.000 probability value is lower than the 0.05 significance level, hence it can be referred to as a significant positive predictor.

V. CONCLUSION AND POLICY RECOMMENDATION

The objective of this research was therefore to establish an empirical investigation of the effects of SRM on procurement performance of the Nigerian government procurement agencies including the BPP and NAPIMS. Using ordinal regression analysis of questionnaire data, we examined five key dimensions of SRM: Known types of relationships include, supplier quality improvement (SQM), supplier lead time reduction (SLT), trust based relationships (TBR), supplier collaboration in new product development (SCL), and supplier partnership development (SPT).

The results indicate that although both SQM and SLT were positively correlated with a non-significant level to procurement performance, TBR, SCL, SPT were found to be significant and positively related with improvement in procurement performance in these agencies. Based on these findings, it can be concluded that relationship management, especially trust, collaboration and partnership management perspective are central to enhancing procurement performance in Nigerian government agencies.

Based on these findings, we recommend a comprehensive policy framework that emphasizes: Some of the specific application of the proposed framework include:

(1) structured training programs aimed at improvement of trust-creation and communication skills; (2) contracts with longer term horizon to strengthen buyer-supplier relationships;
(3) collaborative platforms for co-development of products;
(4) supply development programs for supplier development; and
(5) enhanced supplier evaluation and feedback systems.
All the recommendations included in this paper have the potential of establishing a more effective and responsive procurement system that optimally harnesses the value of supplier relationships.

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