

Assessing the influence of monitoring and knowledge – related challenges on compliance with public procurement law in North-West, Nigeria

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Received 13th December, 2019; Accepted 13th January, 2020

ABSTRACT: The increasing cases of non-compliance to public procurement Act (PPA) 2007 is a pervasive problem in public sector procurement of infrastructure, and this development poses a threat to achieving the main goals of enacting the public procurement Act 2007. Studies have shown that improving the knowledge based of procurement personnel and effective monitoring are correlates of compliance, but the nexus between these parameters and compliance lack empirical validation in the literature. This is aiming at purging the public sector competition, efficiency and transparency. This study explored the influence of knowledge and monitoring on compliance with public sector procurement law in Nigeria. A questionnaire survey involving 143 public sector procurement professionals in North-West Zone, Nigeria was undertaken to assess the influence of monitoring and knowledge related factors on compliance with public-sector procurement. The data were analyzed using partial least square-structural equation modeling (PLS-SEM). The PLS- SEM results show that monitoring and knowledge and compliance with public procurement Act are positively correlated. Knowledge and monitoring factors were responsible for 0.38 (38%) variance in compliance with PPA. The model goodness of fitness GoF indicated a well fitted figure of 0.537 which is above the threshold baseline. Based on the results therefore, improving monitoring and knowledge of personnel by the bureau of public procurement (BPP) can lead to total compliance with the PPA, hence, only trained and certified procurement personnel should oversee procurement process in all public sector organization.

Keywords: Challenges, compliance, knowledge, monitoring, procurement, public organization.

INTRODUCTION

It is over a decade (4th June 2007) that Nigeria joined the league of nations that enacted legislation on public procurement of goods and services. The Act contributed as well improved the country's standard of living through prudent public expenditure on capital goods and services. On the other hand, it is faced with many challenges and constraints that inhibits its implementation by the various organs of governments- Ministries, Departments and Agencies (MDAs). Many stakeholders have opined that having enacting the Act by the legislatives, despite all challenges associated with its implementation, is better

than what the country was before the enactment. This is because the reform has helped to confront the problems caused by corruption, fiscal irresponsibility, non-value for money, absence of public financial control, paucity and non-use of certified procurement staff. However, there are challenges of knowledge and monitoring which resulted in time and costs overrun in government expenditures (Ogbonna and Kalu, 2012).

Consequently, the huge cost incurred by the government in the procurement of goods and services could not be reasonable justified. The citizens were either disappointed

or were doubtful of the sincerity of the government. Jacob (2010) pointed out some positive impacts of the Act. These include, harmonizing the current policies and practices of government public procurement processes, accountability and transparency, establishing pricing standards and benchmark in the procurement system. These impacts and others are the core objectives of the Act as stated in part II section (4) (a)-(d). Therefore, the Act serves as tools which promote and integrate social and industrial policies of the central government. Through it, the domestic industry and employment opportunities will be boosted by giving preferences to national industry, in awarding procurement contracts to indigenous contractors and suppliers (Onyema, 2011; Jibrin et al., 2014; Olayiwola and Oyegoke, 2009).

Despite the positive impacts and benefits claimed to be obtained through the implementation of the guidelines in the Act, some shortcomings cannot be ruled out. These are being observed as challenges to the various MDAs as well as stakeholders in the procurement processes. Some of the prominent negative impact of the Act is the lengthy service delivery and failure of executive arm of government to fully implement the law. Others are inadequate personnel and competent professionals to handled procurement processes at the various MDAs or at the tender's board of the various procuring entities (Yahaya et al., 2019b).

For instance, timeframe before any award could be made is determined by the timely appropriation of the annual budget. The Act mandated that a period of about six weeks is required before spending. The six weeks is for advertisement. Another one to two months is required for processing, awarding and signing of agreement, if there is no complain from the various bidders. Such timeframe is lengthy and wasteful. The timeframe is capable of making the procurement process to be less thorough and shoddy (Yahaya et al., 2019).

This resulted in non-compliance with the Act by many government ministries, agencies and department (Agaba and Shipman, 2017). Fayomi (2013) stated that only 32% of the 2012 capital appropriation was utilized, while the executive arms said it was 52%. In 2001, only N36 billion was used out of the N140 billion of the first quarter capital funds released to the MDAs. This is attributed to the non-compliance on the Act by most MDAs due to nexus of knowledge and monitoring from the personnel responsible for it (Fayomi, 2013). Gelderman et al. (2010) stated that compliance occurs when the target performs a requested action, but is apathetic about it, rather than enthusiastic and puts in only a minimal or average effort. Several countries have instituted reforms in their procurement processes (Hunja, 2003; Onyema, 2011; Omagbon, 2016). This minimized the poor performance envisage in the procurement processes of most public sector due to lack of qualified procurement personnel, incorrect interpretation and application of some provisions of the procurement Act (PPA, 2007).

Country Procurement Assessment Report (CPAR)

prepared by a team of Government officials, World Bank and donor staff, and national consultants, reveals substantial inefficiency in public procurement and conclude that the principle of "value for money" is not achieved. This is true for both governments financed and donor financed procurement. The main findings of the 2002 Country Portfolio Performance Review of World Bank projects also reviewed slow project implementation and disbursement among other factors due to, a large extent of inadequate procurement planning, non-transparent procurement procedures and poor contract management. A review in 2002 of 132 works contracts which constitute an important part of public expenditure indicated that about 84% incurred cost-overruns of up to 30% of the initial amount (World Bank, 2004). Similar findings of public procurement weaknesses were recorded in the 1996 Country Procurement Assessment Report (World Bank, 1996).

There is a knowledge gap on how knowledge and monitoring influence on compliance with the public procurement Act 2007 in most organization in the North-West Nigeria. Knowledge and monitoring influence can contribute to improved compliance of the procurement law in government organization in the study area. Only when the procurement law is well implemented, that it is easy to identify areas where there is need for improvement and review as recommended by researchers (Kakwezi and Nyeko, 2010; Onyema, 2011; Jibrin et al., 2014; Olusola et al., 2016). Organizations which do not have sound knowledge and monitoring in procurement activities means in their processes, procedures, and plans experience poor compliance and less value for money in their procured goods, works and services (Artley and Stroh, 2001; Amaratunga and Baldry, 2002).

LITERATURE REVIEW

Concept of public procurement

Public procurement means an acquisition, whether under formal contract or otherwise, of works, supplies and services by public bodies using publicly sourced finances. It involves the purchasing, hiring or obtaining by any contractual means of publicly needed goods, construction works and services by the public sector. It also includes situations in which public funds are mobilized to procure works, goods and services even if the government does not get directly involved.

Theoretical framework of the study

Compliance with public procurement

Compliance is a state of being in accordance with established guidelines, specifications, or legislation or the process of becoming so. It is, in general, conformity to a

rule, policy, standard or law that has been clearly defined. In most countries, generally means compliance with laws and regulations and these laws can have criminal or civil penalties when not observed properly, (Lyson, 2006). It also makes it easier for an organization to pinpoint flaws in its system or improve existing standards that fail to meet the company or business' goals. In a corporate setting, more and more companies are using "key performance indicators" for years to track data that can help to measure progress toward whatever goals a company has. Each compliance indicators are relevant to the organization's goals.

Essentially procurement compliance in organizations takes place both internally and externally. Internally, it is best practice for companies to implement the use of software applications to ensure obedience with processes involved in sourcing, buying, contracts and suppliers. According to a survey conducted using eight different procurement programs, those companies which ensured best practices in procurement compliance in demand management and contracts had the highest returns. Similarly, compliance with strategic is a best practice which is greatly regarded in terms of benefits.

Public procurement is an important function of any government. The magnitude of procurement outlays has a great impact on the economy and needs to be well managed. It has been estimated that financial activities of government procurement in all countries in the world are of the order of 10 to 30% of GNP (Calendar and Mathews, 2000). Public procurement devotes significant resources and time, to ensure the processes and the procedures are sound, transparent, shared and followed. Therefore, efficient handling of procurement outlays is always a challenge to many countries, especially the developing countries with many developmental agendas yet to be executed. Bureau for Public Procurement (BPP) has the mandate of monitoring procurement activities including the issue of procurement compliance in Nigeria (PPA, 2007).

Monitoring related factor

Monitoring of public procurement is continuous process of ensuring that procurement system in use, is properly implemented to meet intended objectives, obstacles toward achieving are identified and mitigated, feedback is provided to all involved in the system and for further improvement. Moreover, public procurement regulatory authority (BPP) issues standard regulations and rules which are used as guidelines to procurement professionals and procuring entities, which through them (BPP) set benchmark and evaluate procuring entities against that bench mark.

Knowledge related factor

Knowledge management is defined as "performing the

activities involved in discovering, capturing, sharing, and applying knowledge so as to enhance, in a cost-effective fashion, the impact of knowledge on the unit's goal achievement" (Becerra-Fernandez and Leidner, 2008). Effective knowledge management within an organization can lead to a competitive advantage. On average, construction firms that effectively manage their knowledge achieve a five percent increase in their return on bidding, return on assets, operating income to assets, and operating income to sales (Holsapple and Wu, 2011). Benefits of effective knowledge management include superior knowledge acquisition, superior storage and retrieval, superior sharing and dissemination, and superior decision-making (Holsapple and Wu, 2011).

For organization personnel to capture knowledge from their counterpart and private, they must understand the difference between tacit and explicit knowledge. Explicit knowledge is articulated in some sort of trade secret, patent, copyright, process, written instruction, or document (Nissen, 2006). Tacit knowledge on the other hand, is knowledge specific to an organization or firm and gained through experience (Nissen, 2006). Tacit knowledge is often more powerful than its explicit counterpart (e.g., reading a book about flying an airplane is not the same as having experienced flying), but it is also problematic: it does not flow freely; it is difficult to transfer; it is not easily understood by others; and it is often taken for granted until it is gone (Nissen, 2006). This is particularly the case when tacit knowledge walks out of the door in the minds and experiences of seasoned professionals who retire, quit, transfer or otherwise leave an organization.

The more knowledge an organization personnel has on procurement Act and its operation processes, the more likely the organization to be successful in its yearly procurement activity. Public sector organization, that rely on explicit knowledge for an efficient, accountable and economy are susceptible to be poorly in its organizational goals.

Public procurement prospects and challenges in Nigeria

Despite the challenges mention above facing the PPA (2007), the Act has attained numerous goals and achievement in terms of its said objectives. According to report on the BPP web site, that many states have adopted the PPA (2007) in conducting their procurement process e.g Kaduna, Lagos, Sokoto, Kogi, Kano, Osun and many more states. National and international agencies are now paying good attention to our procurement processes (Onyema, 2011). Fayomi (2013) mention about 8 to 9 prospects which the procurement Act (2007) succeeded such as: new orientation in the conduct of government business, transparency and accountability in government, good governance of public money, reduce influence of quacks contractors and increase rate in commitments to the principles of competency.

Table 1. Timeframe for appropriation of annual budgets (2008 to 2017).

Fiscal Year post PPA 2007	Date NASS Received Estimates from Mr. President	Date revised Estimates sent to Mr. President for assent	Date Mr. President assented to budget	Date appropriated capital budget released to MDAs	Time frame btw Mr. President presentation and signature	Time frame btw Mr. President assent and released to MDAs
2008	8th Nov. 2007	27th March, 2008	14th April, 2008	Not available	5 months 6days	
2009	2nd Dec. 2008	3rd Feb. 2009	10th March, 2009	First quarter, 2009	3 months 7days	NIL
2010	23rd Nov. 2009	25th March, 2010	22nd April, 2010	second quarter, 2010	5month	1 Month
2011	15th Dec. 2010	25th May, 2011	26th May, 2011	30th June, 2011	5 months 14days	1 Month 3 days
2012	13th Dec. 2011	15th March, 2012	13th April, 2012	June 2012	4 months	2 Months
2013	10th Oct. 2012	30th Jan. 2013	26th Feb. 2013	2nd quarter, 30th June 2013	4 months 15days	5 Months
2014	19th Dec. 2013	22nd April, 2014	21st May, 2014	30th June to Oct. 2014	5 months 2days	1 Month 6 days
2015	17th Dec. 2014	28th April, 2015	19th May, 2015	Second quarter, 2015	5 months 1 day	Less than one month
2016	22nd Dec. 2015	23rd March, 2016	06th May, 2016	13th May to Sept. 2016	4 month 14 days	5 days
2017	14th Dec. 2016	11th May, 2017	12th Jun. 2017	20th June to date 2017	6 months	7 days

Consequently, such kind of reforms must face different kind of challenges and obstacles despite its good prospects mentioned above from various angle of the country. Such challenges are obvious from MDAs, government officials, contractor, consultants and service providers, politicians and even some ordinary citizens where such projects are located. Onyema, (2011) mention about 6 to 8 challenges facing the PPA (2007) in Nigeria. Among such challenges are; refusing to accept the changes in the new procurement Act by various MDAs, political interference, non-inaugurating of the national council on Public Procurement (NCP), splitting of contract into smaller unit for easy approval, inefficient and ineffective structure of the public procurement cadre in the civil service rules, inability of the anti-corruption agencies to promptly try and dispose public procurement cases, poor enlightenment of the general public, late passage of annual budgets, poor screening of the technical and financial capabilities of the contractors and service providers during pre-qualifications, lengthy time frame in getting

agreement prepared and signed by the legal unit of MDAs, which resulting in late site possession and other more challenges.

According to Jibrin et al. (2014), such kind of challenges ranging from; lack of media publicity, enforcement, poor records management, organization culture, political interference, professionalism, organizational incentives, moral obligation and social influence, purchase's familiarity with the rules and regulation, top management support, high corruption, bad corporate governance and poor service delivery. He further concluded that non-definition of the cadre in the civil service rules, which impact negatively to the implementation process of the Act. In addition, lack of training, among procurement officers and professionals in the area so as to conduct a sound and acceptable public procurement process. In addition, the Act is inflexible and much bureaucratic systems which contribute in contract award, increase cost and unfair competition among bidders. However, Fayomi (2013) argued that most of those

challenges affecting the government policies were largely perceived by service users (suppliers and contractors) and stakeholders in the sector. To him, such service users are the catalysts which intentionally slow down the procurement process.

Similarly, Fayomi (2013), Jibrin et al (2014), Onyema (2011), Olayiwola and Oyegoke (2009) and Jacob (2010) have the view and belief that lengthy timeframe of procurement process, late passages of annual budget as shown in Table 1 has a serious negative impact on public procurement system in terms of efficiency, economy value for money, demand and needs of the beneficiaries, which also lead to high cost of projects, poor service delivery and other effect to the end user.

Looking at the above challenges, one can simply identify how such challenges impact on government policies. To include, agricultural programmes, mass housing scheme, N-Power programme, school feeding, free education and many other viable policies that may enhance the standard of living. For instance, chief executives

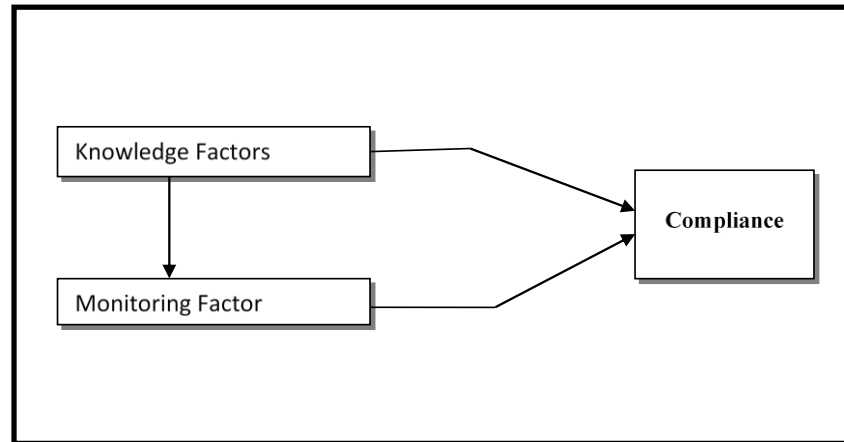


Figure 1. Conceptual frame work of PPA 2007 challenges on public sector procurement (PSP).

may collude with either the contractor or consultant during the bid evaluation and award of contract to divert some or complete money allocated to a project for his personal gain. Such mistrust and corruption habit pose a serious threat to the economic development and internal security management. According to established records from the Bureau of Public Procurement (2012), about N160 billion naira was secured to the country as a result of inflated contract cost as well as collusion between contractors and MDAs during developmental projects for the benefits of Nigerians.

Thus, the objective of this research is to assess the influence of knowledge and monitoring on compliance (Figure 1) with the PPA 2007 in North-West Nigeria, which was instituted to address some of these observed anomalies.

H₁: Monitoring challenges has no significant effect on compliance with PPA 2007.

H₂: Knowledge challenges has no significant effect on compliance with PPA 2007.

H₃: Compliance challenges has no significant effect on public sector procurement.

H₄: Knowledge challenges has no significant effect on monitoring of public sector procurement.

RESEARCH METHODOLOGY

Research design

A research design can be explained as the strategy, plans and steps needed to answer research questions (Gacenga et al., 2012). It is a logical or systematic sequence that links the data to the research questions and to the conclusion of a study (Yin, 2003). It forms the basis of data analysis in any scientific research, is very essential and must be guided by scientific principles (Eldabi et al., 2002). However, this study adopted non-experimental research

design also known as survey research design. Survey research strategy comprises of process of collecting data through questionnaire and interview.

Research population

The population for this study comprises federal agencies that are operating in the study area (North-west geopolitical zone). The population frame consists of 143 organizations that carried out different category of operations in North-West States.

Sample and sampling frame

The sample unit for this study is procurement unit/departments while the sample elements are Directors, chief procurement officers and members of the tenders' board in the organisations. The sample frame consists of all federal government organizations on the national database of National Bureau of Statistics (NBS) 2015.

Sampling techniques

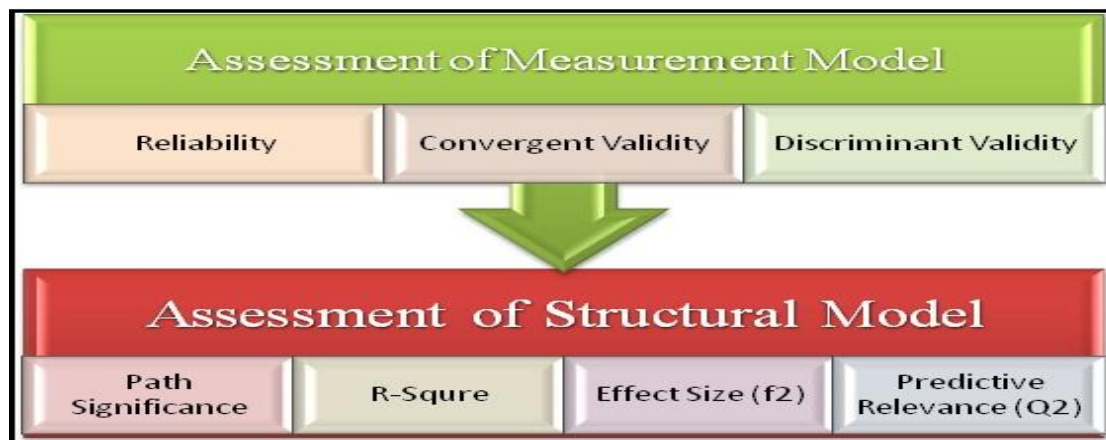
The study employed a stratified simple random sampling technique in drawing the sample size. This is achieved by dividing the population of 143 by the number of stratum (states in the North-West geopolitical zones). Samples within each state in the stratum (federal agencies) where drawn (Creswell, 2012). Each agency has common characteristics or identification means, in which other does not have such as, the name, functions and type of operation.

Sample size

The list of all federal agencies within the study area as contained by the domestic database of the National

Table 2. Population frame and sample size.

Parameter	Kaduna	Kano	Katsina	Jigawa	Sokoto	Kebbi	Zamfara	Total
Population	21	21	20	20	21	20	20	143
Sample	21	21	20	20	21	20	20	143

**Figure 2.** PLS-SEM evaluation criteria.

Bureau of Statistics (NBS) was aimed to assess and evaluate the procurement unit/departments. Total populations of 143 were sampled to determine the appropriate sample size for the study. With the tendency to reach all populations through the Bureau of Public Procurement Assistance on their contact addresses both at the offices and electronic means (e-mail address). Thus, sample sizes with a 95 percent confidence level, an acceptable 5 percent error margin, 100 percent distribution is assumed. It gives 143 respondents as sample size based on census method as shown in Table 2.

Method of data analysis

Partial least squares structural equation modelling (PLS-SEM) is a variance based second generation multivariate statistical tool used in establishing structural relationship between exogenous latent constructs and endogenous latent constructs. In order to establish the relationship between the research constructs and to test the hypotheses of the research, the partial least squares structural equation modelling was employed. In using PLS-SEM, two stage evaluation criteria were used. The first stage was the assessment of the measurement model to establish if the manifest items measured the underlying construct they supposed to measure. The second stage was the evaluation of the structural model which assess the interrelationships between the research constructs in the model (Ramayah et al., 2011).

Evaluation of the measurement model entails assessing the individual item reliability, the internal consistency of the

models through Cronbach's alpha and composite reliability, convergent validity and discriminant validity (Hair et al., 2012; Memon and Rahman, 2013; Wong, 2016). The structural model is assessed by evaluating the individual path coefficients, the coefficient of determination (R^2), the effect size (f^2), the predictive relevance (Q^2) and the Goodness-of-Fit (GoF) of the model (Hair et al., 2014; Lowry and Gaskin, 2014). This two stage evaluation criteria is presented in Figure 2.

Preliminary list of factors

After a comprehensive and detailed literature review (Yahaya et al. 2019b; Azeem, 2003; Forgor, 2007; Dobler and Burt, 1996) was conducted, the challenges of public sector organization procurement are depicted in Table 3. The questionnaire comprises of two sections. The first section consisted of the respondents' personal information while the section two consisted of the main part of the questionnaire. The section was categorized into three groups in accordance with the nature of the variable identified from literature: Monitoring (MC), knowledge (KRC) and compliance (CMPC).

RESULTS

Demographic of respondents

This study sought to know the demographic profile of the respondents in the sample. The demographic features

Table 3. Procurement challenges in public sector procurement.

Code	Procurement Challenges
Monitoring	
MC1	Poor monitoring of procurement processes by CSO and media houses
MC2	Less emphasis given to monitoring of contractors, suppliers by the Act after the award
MC3	Less frequent of review and revocation of contract by the BPP due to Irregularities and Non compliance
MC4	Non- supervision of procurement officer by the BPP at the various levels
MC6	Lack of integrity of personnel and failure of MDAs to grant access to information to prospective bidders
MC7	Lack of streamlined quality control practices
MC8	Unwillingness of Leaders to govern well/supervised
Knowledge & Research	
KRC1	Most personnel lack frequent training and workshops
KRC2	Timeframe to undergo training by procurement officers and staff inadequacy
KRC3	Timeframe to undergo training by procurement officers and staff inadequacy
KRC4	Lack of experience and knowledgeable personnel on procurement cadre
KRC5	Non familiarity with the rules and regulation by most procurement officers
KRC6	Insufficient personnel on the procurement cadre
Compliance	
CMPC1	Poor Media Publicity
CMPC2	Lack of Enforcement by the regulatory body BPP
CMPC3	Poor Record management by the various MDAs
CMPC4	Lack of Organizational Culture
CMPC5	Lengthy service delivery by both MDAs and Contractors
CMPC6	Much Bureaucracy
CMPC7	Non-use of E-procurement systems by MDAs as an option
CMPC8	Inflexibility of the Act
CMPC9	The needs for Bank guarantees and Bid Bond before advance payment
CMPC10	Lack of moral obligation and social influence from stakeholders in the procurement process
CMPC11	Inadequate details and composition of personnel to handled and monitor procurement units
CMPC12	Non inclusion of State government in the Act during Implementation

observed in this study contain type of organization, years of experience, professional background and gender. The study found that 42.9, 38.4, and 18.70% of the 143 respondents were from tertiary institutions, federal parastatals, and contracting firms, respectively. Likewise, their working experience ranged from 1 to 35 years, while males constituted 86.5% and females 13.5% of the population. Furthermore, the professional with various discipline (Quantity surveyors, Architects, Lawyers, Engineers and Accountant) are 36.6, 12.6, 19.4, 24.7 and 6.7% respectively. Their location was state capital areas, across Nigeria.

Measurement model assessment

PLS-SEM in research provides an opportunity to examine reliability and to differentiate validity during scale growth by means of a confirmatory factor analysis (Hair et al., 2010). The purpose of the external model analysis is to

measure the accuracy and validity of the variables and latent variables observed. There are four types of evaluating the accuracy and validity of the measurement system, such as internal consistency reliability, construct reliability, convergent validity and discriminatory validity (Hair et al., 2012).

SmartPLS assesses internal consistency reliability and builds values for Cronbach's alpha and Jöreskog's (ρ_c) in the model as shown in Table 4. The values above 0.70 are acceptable (Hair et al., 2012); therefore, all values in the design of the model met the threshold criteria for Jöreskog's. Although both Cronbach's alpha and (ρ_c) are used for constructs reliability, (ρ_c) is also used based on the composite reliability (CR) approach, because it requires responsiveness to the number of items. For indicator reliability (Hair et al., 2011), an external loading of variables (observable) on the corresponding variable (latent) greater than 0.50 is desirable. Table 4 displays the outer loading from 0.540 to 0.830. Indicator accuracy is averagely being achieved for most construct. The average

Table 4. Reliability and validity of construct.

Latent construct	Indicators	Loadings Indicator	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)	AVE
Monitoring	MC1	0.71	0.761	0.630	0.550
	MC2	0.57			
	MC3	0.54			
	MC4	0.56			
	MC6	0.54			
	MC7	0.61			
Knowledge & Research	KRC3	0.79	0.827	0.689	0.615
	KRC5	0.73			
	KRC6	0.83			
Compliance	CMPC3	0.68	0.884	0.853	0.601
	CMPC4	0.55			
	CMPC5	0.62			
	CMPC6	0.70			
	CMPC7	0.63			
	CMPC8	0.75			
	CMPC9	0.64			
	CMPC10	0.66			
	CMPC11	0.72			
	CMPC12	0.61			

extracted variance (AVE) is calculated to measure convergent validity (Hair et al., 2016; Fornell and Larcker, 1981). The generic acceptance criterion for convergent validity is that the AVE for all variables should be greater than 0.50 (Hair et al., 2016). Table 4 displays the values that affirm the accuracy and validity of the measurement method.

Discriminating validity can be assessed using three approaches, such as cross-loading, Fornell and Larcker criteria (Fornell and Larcker, 1981) and the HTMT ratio (Henseler et al., 2015). In order to assess the external consistency of the model, first, cross-loadings were checked, which found that no indicator loads were higher than the opposing design (Henseler et al., 2015). The second measure is the Fornell and Larcker test, which measures the square root of the AVE, and this should be higher than its correlation with any other latent constructs in the system. In contrast, the most recent criterion for verifying discriminatory validity is heterotriat-monotriat ratio (HTMT) (Henseler et al., 2015), which has been adopted and measured in this study. As a rule of thumb, an HTMT value greater than 0.85 is considered a potential discriminatory validity (Hair et al., 2012). Table 5 shows that all values are less than 0.85, which confirms the discriminant's validity.

Structural model assessment

The inner structural model assessment helps to investigate

the empirical data to confirm the underlying theory (Hair et al., 2016). This study confirms the model validation using different tests on the structural level. The structural model can be assessed using path coefficient value (β) and T-statistics, the coefficient of determination (R^2), predictive relevance (Q^2), and the goodness of fit (GOF) index.

The coefficient of determination (R^2) analysis

R^2 is determined by an exogenous latent model, which predicts an endogenous latent construct. In this analysis, one exogenous latent construct (public sector organization) clarify the endogenous model (monitoring, knowledge and research and compliance challenges). The representation is shown at three points, such as soft (0.25), medium (0.50) and significant (0.75) (Hair et al., 2016; Hair et al., 2011). In this analysis, the endogenous latent construct value is $R = 0.38$ and 0.11 which means that 38% and 11% of the endogenous latent construct is explained by the exogenous latent construct. The model is reliable to describe the endogenous latent construct and is considered to be soft because it describes more than 38% and 11% of the variance explained.

Path coefficient estimation and T-Test estimation

The path coefficient for PLS-SEM is similar to the regression analysis and the standardized beta coefficient)

Table 5. Discriminant's validity HTMT.

Construct	Compliance	Monitoring	Knowledge & Research
Compliance	0.775		
Monitoring	0.7279	0.742	
Knowledge & Research	0.6140	0.6087	0.784
Public Org.	0.3177	0.3257	0.2970

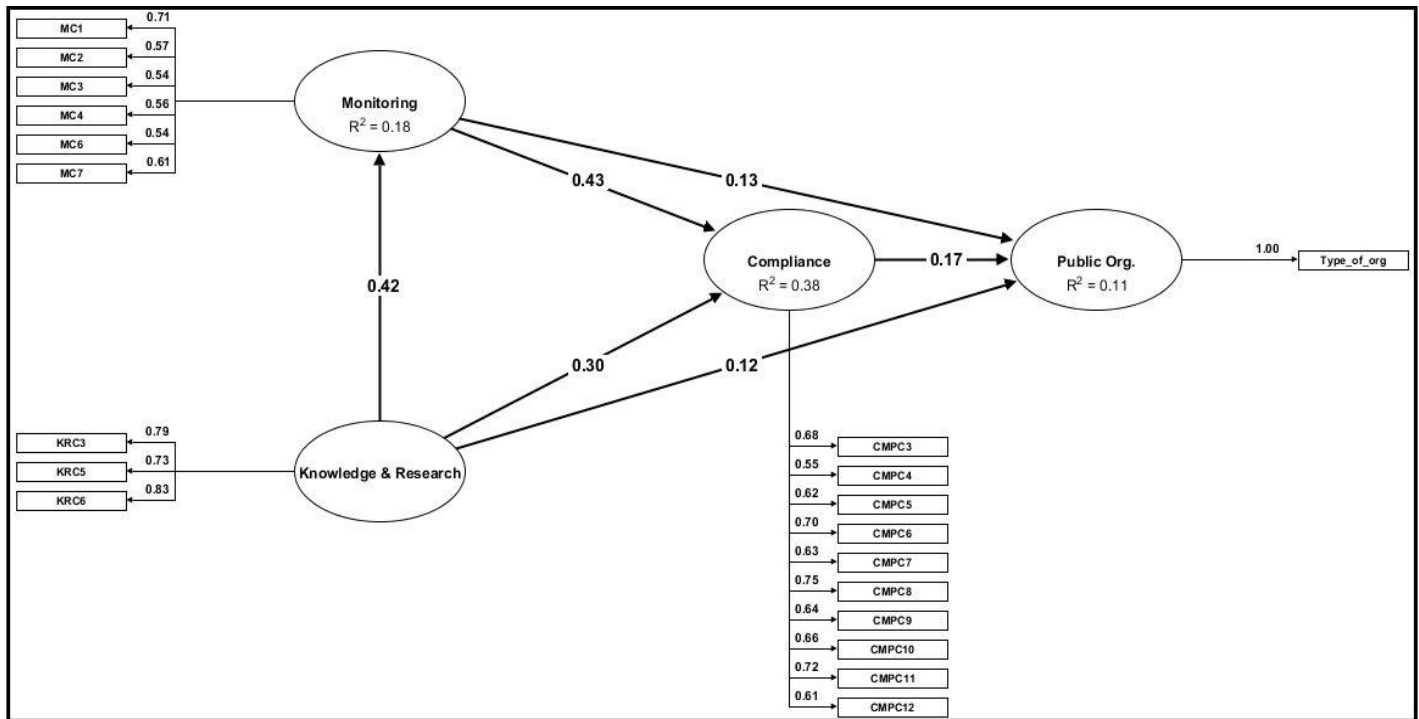


Figure 3. Hypothesis SEM model.

(Henseler et al., 2009). The significance of the hypothesis is checked by measuring the value β of each path on the model, as shown in Figure 3. To assess the model hypothesis, a higher value of β represents the high impact of the exogenous latent construct on the endogenous construct of the hypothesized model. The significance level (p -value) is checked by the T-statistics test of each β value of the hypothesized model. Using PLS-SEM, the significance of the hypothesis can be determined with the aid of the bootstrapping method for each path coefficient. This study set the bootstrapping sample to 999 for the generation of standard errors, the significance of the path coefficient and the T-statistics values (Hair et al., 2011). The test result shows the significance of the relationship, as all values were found to be above the threshold.

H₁ hypothesized that monitoring challenges has no significant influence on compliance with the procurement Act. The findings in Table 6 and Figure 3 disconfirm the insignificant relationship ($\beta = 0.431$, $T = 6.439$, $p = 0.000$).

Therefore, H₁ is rejected. That knowledge and research has no positive influence on compliance with the procurement Act 2007 was hypothesized in H₂. The result opposes the hypothesis ($\beta = 0.295$, $T = 4.439$, $p = 0.000$). Knowledge and research (H₃) was also predicted to have no influence on public sector procurement ($\beta = 0.120$, $T = 1.404$, $p = 0.161$), hence, H₃ is supported. Moreover, the results from Table 6 also provide empirical support for H₄, in which the knowledge and research substantially influence monitoring ($\beta = 0.422$, $T = 5.24$, $p = 0.000$).

However, the beta coefficient (β) value describes the strength between exogenous and endogenous latent constructs. The higher the value of variance, the higher the effect will be. Table 7 and Figure 3 shows the calculation results and comparison of both compliance challenges ($\beta = 0.169$) on public sector organization procurement. This indicates that most public sector organization do not comply with the procurement Act in their procurement process, which post a serious challenge.

Table 6. Path Coefficient and T-Statistic value.

Effect	Original Coefficient	Mean Value	Standard Error	T-value	P-value
Compliance -> Public Org.	0.1696	0.1726	0.0906	1.8719	0.0615
Monitoring -> Compliance	0.4312	0.4372	0.0670	6.4388	0.0000
Monitoring -> Public Org.	0.1254	0.1316	0.1033	1.2140	0.2250
Knowledge & Research -> Compliance	0.2951	0.2951	0.0665	4.4392	0.0000
Knowledge & Research -> Monitoring	0.4218	0.4341	0.0805	5.2367	0.0000
Knowledge & Research -> Public Org.	0.1204	0.1246	0.0857	1.4037	0.1607

Table 7. Effect size (f^2).

Effect	Cohen's f^2
Compliance -> Public Org.	0.0201
Monitoring -> Compliance	0.2466
Monitoring -> Public Org.	0.0117
Knowledge & Research -> Compliance	0.1155
Knowledge & Research -> Monitoring	0.2164
Knowledge & Research -> Public Org.	0.0121

Assessing effect size (f^2)

Effect size is the relative contribution of a particular exogenous construct in predicting endogenous construct (Chin, 1998). This is determined by excluding the subject construct from the model to determine the changes that its exclusion made to the structural model R^2 . The effect size is determined based on Cohen's f^2 .

Table 7 shows the effect sizes of the exogenous constructs on the endogenous constructs. Firstly, two of the exogenous constructs have small effect sizes on public organization (compliance and knowledge) having 0.020 and 0.012 effect sizes, respectively. All these effect sizes are considered small on public sector organization procurement by the exogenous construct based on the submission of Cohen (1988). Lastly, MC and KRC have a medium effect size on CMPC as indicated by value of 0.246 and 0.120.

Assessing Goodness-of-Fit (GoF)

Goodness of fit provides a global criterion of assessing the overall quality of PLS model. However, unlike the covariance-based Structural Equation Modelling (CB-SEM), there is no generally accepted goodness of fit measure to evaluate PLS models (Trinchera and Russolillo, 2010). A global quality measure of the structural model is also provided by the average redundancy index, computed as:

$$\overline{Red} = \frac{1}{J} \sum_{j=1}^J Red_j \quad (1)$$

Where J is the total number of endogenous latent variables in the model. As aforementioned, there is no overall fit index in PLS path modeling. Nevertheless, a global criterion of goodness of fit has been recently proposed by Amato et al. (2005), the GoF index. Such index has been developed in order to take into account the model performance in both the measurement and the structural model (Tenenhaus et al., 2005). For this reason, the GoF index is obtained as the geometric mean of the average communality (Com) index and the average R^2 value:

$$GoF = \sqrt{\overline{Com} \times \overline{R^2}} \quad (2)$$

Where: R^2 is the average value is obtained as in equation (3) and Com is the average communality of the AVE value obtained in Table 4.

$$\overline{R^2} = \frac{1}{J} R^2(\varepsilon_j; \varepsilon_q: \rightarrow \varepsilon_j) \quad (3)$$

Akter et al. (2011) submitted a rule of thumb for examining GoF. It is considered small, medium and large if the values are 0.1, 0.25 and 0.36 respectively. Accordingly, the GoF of the research structural model is calculated based on equation (2) and (3) above. This provide the GoF of the current study as seen below:

$$GoF = \sqrt{0.589 \times 0.490}$$

$$GoF = \sqrt{0.289}$$

$$GoF = 0.537$$

Based on the Akter et al. (2011), the model GoF of 0.537 is considered large. Therefore, the research model fitted very well. The model is therefore good.

DISCUSSION OF FINDINGS

This study assessed the influence of monitoring and knowledge and research on compliance with the public procurement Act 2007 by public sector organizations. Partial least square (PLS) approach was adopted to analyses the hypothetical model developed from the

structural equation model result and as a multivariate tool of analyzing such problem (Henseler, 2017). The results indicated that monitoring and knowledge and research has a significant influence on compliance, ($\beta = 0.43$, $T = 6.439$, $p = 0.000$; $\beta = 0.295$, $T = 4.439$, $p = 0.000$) with a significance at $p < 0.05$ level of significance. The coefficient of determination of the two exogenous on the endogenous construct was found to be 0.38, which means that about 38% of the variance in the compliance were emanating from monitoring and knowledge and research variables. Thus, the findings rejected hypothesis H_1 and H_2 .

A subsequent further analysis shows that compliance has no significant influence on public sector procurement ($\beta = 0.169$, $T = 1.872$, $p = 0.062$) with $p > 0.05$ significance level. The coefficient of determination R^2 was found to be 0.11 for the three exogenous constructs on public sector organization, which is being describe as small or soft (Hair et al., 2016; Hair et al., 2011). However, the goodness of the fitness (GoF) of the model in general has shows that the model is fitted very well (GoF = 0.537) which is being considered as large and above the threshold value of 0.35 according to Akter et al. (2011) rule of thumb. This also indicated that most public sector organization carried out their procurement process not in line the procurement Act 2007 provision in purchasing government work, services and goods. This was found to be as the major challenge affecting the procurement system today, due to much bureaucracy, inflexibility of the Act and inadequate details in constituting personnel to handled and monitor procurement units/departments.

The finding agrees with the study of Omagbon (2016) which assess the compliance of Nigerian local government council with the public procurement Act. The study discovered some hitches that prevent non-compliance with the Act by the local council, such as political interference in the procurement cycle by most local government authorities. Fayomi (2013) argued that issues of misconception and criticisms among other have contributed towards the non-compliance with the Act by most organizations and government parastatals. Similarly, in their assertion Jibrin et al. (2014) attributed the non-compliance with the Act is challenges of awareness (Knowledge) in most public sector organization, which corroborate the current study that knowledge and research have significant influence in compliance with the Act. Similarly, Yahaya et al. (2019a) study in challenges of procurement Act 2007 in the implementation of government policies related to construction projects, pointed non-compliance as part of the problem hindering construction projects executing by government. In addition, the level of implementation and compliance was very poor based on their findings. But, in the other hand, the result of the study is not in agreement with Kusi et al. (2014) which confirms that a tertiary institution in Ghana (Takoradi Polytechnic) complies with the Ghana public procurement Act 2003 (Act 663) very well. There only challenges are excessive bureaucracy, cumbersome documentation processes and inadequate storage facilities.

Musanzikwa (2013) in his study to evaluate the public procurement system challenges in developing countries with a case study of Zimbabwe, they pointed some factors such as; political interference, corruption, indigenization policy, incompetence and delays in implementation of awarded projects as the major issues in the sector. Inadequate of monitoring and knowledge and research in the procurement system has affected the main goals of the Act in the past years. This entire problem has happened due to non-compliance with the Act by most government organization when conducting their procurement processes for the fiscal year. As result, government policies and physical infrastructure provision such as road, water, electricity, hospital and project cost overrun where emanating always (Zadawa et al., 2017).

Conclusion and recommendation

This study presented an assessment-based model of influence of knowledge and monitoring on compliance with the procurement Act 2007 to reduce the level of corruption, delay on public projects and increase the value for money gain by the public when executing government projects or works. Procurement laws are meant to be used by the procurement entities (MDAs) as procurement guide directing them on the right path in conducting their procurement processes. Monitoring and knowledge of the public sector organization was identified as the major factors affecting the compliance with the procurement Act 2007. This subsequently affects the attainment of the main goals of the procurement, especially the value for money and efficiency. The study concluded that, improving monitoring and knowledge of personnel by the Bureau of Public Procurement (BPP) can lead to total compliance with the Act and motivate those procurement officers in organization by given them comprehensive training on the area. Thus, the study has recommended that only those trained and certified procurement personnel will be allowed to head and oversee the affairs of procurement process in all government organization. These will result in achieving the main aim of the system within a short period of time and governance system will be improve in terms of accountability, transparency and economy. This study's results provide valuable information for procurement professionals' government personnel and practitioners to maintain sound implementation as a contribution to sustainable procurement processes.

CONFLICT OF INTEREST

All authors have no conflicts of interest to report.

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