Mediation Model for Improving Compliance with Public Procurement Manual that Affects Cost Performance of Construction Projects in Nigeria

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Abstract

Implementation of the procurement manual for construction project procurement in most developing countries and especially in Nigeria is facing challenges, which is affecting performance of construction project cost-wise. The conflict of interest factors in construction procurement practices were identified as one of the foremost causes of noncompliance with the procurement manual which affects the cost performance of construction projects. A structured survey questionnaire was used in collecting data from the procurement entities of nine randomly selected Nigerian public universities. Process Macro was used for the mediation analysis and the result proved that, the mediation effects of enforcement mechanism on conflict of interest factors that affects cost performance of construction projects was positive and totally different from zero; the bootstrapped confidence intervals within which the mediating effects occur did not involve zero either. These signify mediation occurrence in the study mediation model. The study recommends the initiation of enforcement actions in the form of penalties to defaulters by all procurement entities. The study re-echoes the need for the establishment and empowerment of the national procurement regulatory commission responsible for ensuring due compliance with the procurement manuals.

Keywords: Mediation Model, Compliance, Procurement Manual, Cost Performance

INTRODUCTION

As a vital economic sub-sector, the construction industry in most countries has underwent different forms of reforms which set the phase for the issuance of construction procurement guidelines or procurement manuals for sustainable procurement of construction projects [1, 2]. In Europe, the EU tendering and procurement directives has been formulated and adopted since 1970s, applicable to all the EU member countries [3]. In Australia procurement manuals were developed within the Department of Finance at Federal level as specified in the Financial management and accountability Act 1997 (FMA Act). In Malaysia, tendering and procurement processes are regulated in accordance with the financial procedure Act 1957 and government contract Act 1949 (OECD, 2007). In South Africa, there were a number of procurement reforms that were targeted towards effective public procurement practices [4]. Similar, the establishment of procurement regulatory manual in Ghana was reported by Ameyaw, Mensah [5]; in Kenya by Sang and Mugambi [6] as well as in Uganda by Eyaa and Pross [7].

Nigeria is still in the process of fulfilling its basic infrastructural needs as a developing nation [8]. This has necessitated the introduction of several public procurement reform initiatives, including the enactment of the Public Procurement Act (PPA, 2007) as the policy governing public expenditure in the country. The PPA 2007, subsequently, highlighted the public procurement manual as the procedural guideline for public procurement processes including construction procurements by the public procurement entities. However, effective implementation of the procurement manual among construction project parties has not been achieved [9]. According to the literature, conflict of interest among construction project parties was highlighted as one of the major factors causing the non-compliance with the procurement manual that affects the performance of construction projects cost-wise [10, 11]. Similarly, Shehu [12] posited that, in most developing countries including Nigeria, poor cost performance of construction projects is directly linked with conflict of interests at both pre-contract and post-contract levels.

Previous studies on construction project performances are delimited to the provision of the insight into the factors responsible for the poor cost performance of construction projects [13-16]. Factors responsible for non-compliance with the procurement manual, especially the factors on conflict of interest that affect the cost performance of construction projects, were not considered in prior studies. Identifying and assessing the impact of the conflict of interest factors that affect compliance with the procurement manual and contribute to the poor cost performance of construction projects is a timely needed research in the construction management field. This study fills this gap by introducing enforcement as a mediating variable for effective compliance with the procurement manual to enhance the cost performance of construction projects. This was achieved using Process Macro developed by Hayes [17] for analysing mediation and moderation model and conditional process analysis.

LITERATURE REVIEW

Issues of compliance with procurement manual seems be a subject of debate across the globe. In the Europe, Boer and Telgen [18], observed that, the improper utilization of EU procurement directives has left a wider gap that needs to be filled in order to achieve its mission. Among OECD member countries, application of procurement proceedings remained seldom in certain economic sectors [19]. In Malaysia, an interview with contractors revealed cases with inappropriate application with procurement rules [20]. In South Africa issues of non-compliance were inform of avoidance of competitive tendering, inappropriate utilization of procurement systems [4, 21]. In Ghana Ameyaw, Mensah [5] speculated that the implementation of the Ghanaian Public Procurement Act also known as Act 663 2003 has been facing a lot of snags, making the attainment of the procurement reform goal a difficult task in the country. In Uganda Eyaa and Pross [7] posited that, a high level of non-compliance with procurement regulation was reported by the Public Procurement and Disposal of Asset Authority (PPDAA).

Literature was reviewed on the main constructs of the study as presented below. Basically, there were three major constructs that formed the model of the study, i.e., conflict of interest in construction procurement (independent construct) identified as the major cause of non-compliance with procurement manual; cost performance of construction projects (dependent construct) and enforcement (mediating construct).

Conflict of Interest

The conflict of interest factors were identified as some of the major influences negatively affecting the compliance with the procurement manual. Conceptually, conflict of interest independent constructs in this study that affect the cost performances of construction projects (the outcome construct). Conflict of interest is an important research variable and a complex construct that has received ample attention in applied sciences literature. It is also a well-recognized research measurement construct in the management field, and in construction procurement education and management as well [22]. Construction procurement contracts by public authorities have been associated with the management of public funds and it is considered politically sensitive in terms of accountability and transparency [10]. Conflict of interest arises usually due to discrepancies among parties or stakeholders, persons, groups or individuals in relation to decision-making [23]. Considering the huge financial resources involved in public procurement processes, the majority of the tasks are undertaken in a setting that is vulnerable to conflict of interest as it is associated with ample political and high public expectations for the improvement of services [10]. In the Nigerian construction industry, one of the major reasons for the ineffective compliance with the procurement manual is the rampant conflict of interest among the procurement stakeholders, especially members of the construction design team [12].

Cost Performance of Construction Projects

Cost in construction projects is one of the major gauges of measuring the overall project performance (Akinsiku, 2014; and Sumner & Slattery, 2010). A project performs well when it is delivered within the budgeted cost, anticipated time and expected quality [24]. Cost has a significant role that runs throughout the entire life cycle of a construction project [25]. A project executed within the appropriated cost budget is said to have fulfilled its basic performance requirement; thus, it accomplishes the client's need of good value for money based on compliance with the procurement and technical specifications [26]. Globally, the performance of construction projects has been suffering cost-wise, posing a challenge to the construction sector that is yet to be resolved, especially in developing countries [27]. Earlier findings linked poor cost performance of construction projects in Nigeria to absolute reliance on imported building materials, which subsequently resulted in the loss of value-added to the entire sector, thus negatively affecting the industry's productive capacity and economic inputs for national development [28]. Researchers are yet to assess the effects of conflict of interest among procurement stakeholders as factors affecting the compliance with the procurement manual that subsequently affects the cost performance of construction projects. Conflict of interest among construction project stakeholder's results in selective implementation and non-compliance with the procurement manual that leads to poor workmanship and subsequent rework which usually attracts unbudgeted costs.

Enforcement Mechanism (The Mediating Variable)

Enforcement was identified as a mechanism for the effective compliance with the procurement manual; thus, it was introduced as the mediating variable into the study model. Based on the hypothesized model of the study (Figure 1), enforcement was posited to mediate the effects of the conflict of interest factors on construction project cost performance. According to Gunningham [29], enforcement has always been considered as a fundamental element of compliance in almost every sector and discipline. Developing countries like Nigeria, Bangladesh, India, Sri Lanka and Venezuela have been observed to be affected more by rampant irregularities in public procurement practices mainly due to the non-enforcement of the procurement manual and the directives as provided by their respective procurement policies [30, 31]. Similarly, Okeahalam [32] stated that among the developing countries, especially in Africa, Nigeria and Ghana in particular, they are characterized by weakness in terms of regulating enforcement, generally. In Nigeria, the procurement law (PPA, 2007) provides for the establishment of a National Council of Public Procurement (NCPP) as the Apex procurement management body to be in

charge of awarding capital projects and overseeing the affairs of the Bureau of Public Procurement (BPP), including the enforcement of the entire law and the procurement manual [33]. Unfortunately, to date, the NCPP has not yet been established and the procurement manual has yet to be enforced [9, 34]. Achieving a great level if not full implementation of the procurement manual and procedural manual requires the threat of legal sanctions in the form of enforcement actions [31].

Hypothesized Mediation Model of the Study

In view of the above review on the study constructs, the study proposed a mediation-based model that posited the relationship between all three constructs, denoted as *path-a, path-b and path-c (Figure 1a)*, as well as the mediating effects of enforcement on procurement manual noncompliance factors (conflict of interest factors) that affect the cost performance of construction projects, denoted as *path-c' (Figure 1b)*. To effectually analyse the hypothesized mediation model, all the three of the study constructs: conflict of interest, enforcement and cost performance of construction projects, were measured with a Five-point Likert scale. The Five-point scale was capable of incorporating all of the constructs, and best suited the characteristics of the survey in construction education [35]. The scale was used with respect to the sections of the survey instrument to allow for quantification and comparison of the respondents' opinion [36]. For the dependent construct, the scale defined the level of cost performance of construction projects from extremely low performance to extremely high performance as adopted from the studies of Gambo, Said [15], Memon, Rahman [16], Khosravi and Afshari [37]. Conflict of interest among major construction procurement stakeholders as the independent construct was measured using the Five-point Likert scale, starting from extremely low effects denoted by 1 to extremely high effects denoted by 5. Similarly, the Likert scale was used in measuring the conflict of interest effects on procurement management performance by Obicci [10], Ernest Osei – Tutu, Kofi Offei – Nyako [38]. The effects of enforcement mechanism as the mediating construct was equally tested with the Five-point Likert scale adopted from the studies of Sang and Mugambi [6].

The hypothesized mediation model has been presented in Figure 1; based on the identified constructs that formed the study model, two non-directional hypotheses were developed in line with the aim of the study.

- *H₁: There is a causal relationship between the conflict of interest as factors affecting non-compliance with the procurement manual and construction project cost performance.*

- *H₂: Enforcement mechanism mediates the effects of the relationship between the conflict of interest factors among the construction procurement stakeholders and construction project cost performances.*
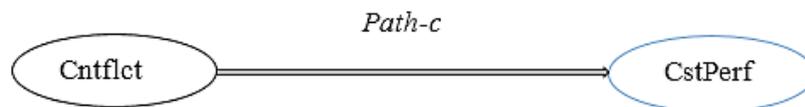

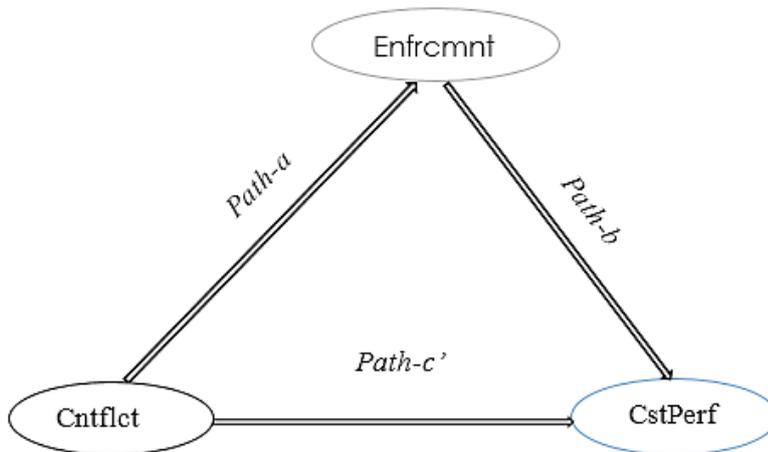Figure 1a: Total effects of the Hypothesised model

Figure 1b: Direct & Indirect effects of the Hypothesised Model

Figure 1: Hypothesised Mediation Model of the Study

Cnflc = Conflict of interest, CstPerf = Cost Performance, Enfrcmnt = Enforcement

Figure 1a has described the total effects between the conflict of interest factors, i.e., the independent construct, and the cost performance of construction projects as the outcome construct of the study. The hypothesized relationship coefficient has been denoted as *"path-c"*. Figure 1b defined the direct effects between the conflict of interest factors (independent construct) and the cost performance of construction projects (dependent construct) through the mediating construct (enforcement mechanism) denoted by *path-c'*, as well as the indirect effects of the hypothesized model denoted as *"path-a" and "path-b"*.

Mathematically, total effects = Direct effects + Indirect effects

$$i.e., c = c' + ab$$

The total effects *"Path-c"* is the regression coefficient describing the effects of the independent construct on the outcome or dependent construct in the model (Figure 1a). The direct effects *path-c'* is the regression coefficient predicting the independent construct from the dependent construct through the mediating variable. The indirect effects in the model is the product of the *path-a and path-b* coefficients of determination *(ab)* as shown in Figure 1b; where, *path-a* is the regression coefficient assessing the mediating construct from the independent construct while *path-b* is the regression coefficient estimating the outcome or dependent construct from the mediating variable of the study's hypothesized model.

RESEARCH METHODS

This study was based on the quantitative research methodology using the survey approach and structured questionnaire as the main instrument used in collecting data. According to Sekaran and Bougie [39], the survey strategy allows the researcher to measure the study constructs to fittingly answer the research questions. The stratified proportionate random sampling technique was used in selecting the research sample for it assures a certain level of precision even if its probability is close to zero [40]. A total of 540 structured survey questionnaires were distributed to major construction procurement stakeholders and project parties in nine randomly selected procurement entities across public universities in Nigeria. The universities were selected from the Northern region of Nigeria because the region is categorically characterised with issues of non-compliance with the procurement manual [41], is deficient in educational infrastructure facilities [42] and represents almost 80% of the country's landmass [15]. From the 540 administered questionnaires, 410 were retrieved but only 374 were used in the mediation analyses. The study recorded the overall return and response rates of 76% and 69%, respectively, compared to the research of Ernest Osei – Tutu, Kofi Offei – Nyako [38]

with returned rates of 71% and 67%, respectively. The high response rate was achieved because the survey instruments were self-administered by the researcher and ad hoc research assistants. The research assistants were graduates and participants of the National Youth Service Corps (NYSC) who had studied Quantity Surveying, Building Technology and Architecture.

Assessing the Mediating Effects of Enforcement as a Compliance Mechanism using Process Macro

In recent times, mediation for data analysis in behavioural and applied sciences fields, including construction education, is becoming prevalent among researchers [43]. Mediation as a modern statistic with different approaches allows researchers to explore and understand how and why relationships and or effects exist between study variables [43, 44]. In this study, the mediation effects of enforcement on the conflict of interest factors that affect the cost performance of construction projects were achieved using Process Macro written by Hayes and Scharkow [45]. Process Macro is one of the recently developed mediation software, capable of assimilating a number of functions of different mediation techniques into a single procedure [46]. The mediation methods used were:

- Bias corrected bootstrapped confidence intervals (CIs) method as advocated by Efron and Tibshirani [47]

- Sobel test as advocated by Sobel [48]

DATA ANALYSIS AND RESULTS

The data analysis for this study was achieved using Process Macro version 2.15 developed by Hayes [43] as a regression-based mediation analysis package. The results obtained based on the four different paths that formed the study model are presented below:

Indirect effects of Conflict of interest (IV) on Enforcement (MV) denoted as "path-a"

The coefficient of the effects of the conflict of interest on enforcement as the outcome construct along *path-a* was 0.4944, the test of the statistical significance t-value was 39.9907, and the p-value was = 0.0000 ($P < 0.05$), indicating significant effects between the independent construct (Cnflc) and mediating construct (Enfrcmnt) as shown. Additionally, the bias-corrected lower limit C.Is (LLCI) and the upper limit C.Is (ULCI) obtained along *path-a* were 0.4700 and 0.5187, respectively obtained at 95% C.Is. Considering that the p-value ($P < 0.05$) and both LLCI and ULCI did not include zero, the effects between the independent construct (Cnflc) and the mediating variable (Enfrcmnt) was significant [45, 49].

Table 1: Effects of the relationship between variables along *path-a*

Outcome: Enfrcmnt						
Model Summary						
R	R-sq	MSE	F	df1	df2	p
0.9007	0.8113	0.0276	1599.2598	1.0000	372.0000	0.0000
Model						
	coeff	se	t	p	LLCI	ULCI
Constant	0.0501	0.0726	0.6897	0.4908	0.0928	0.1930
Cnflc	0.4944	0.0124	39.9907	0.0000	0.4700	0.5187
Covariance matrix of regression parameter estimates						
		Constant		Cnflc		
	Constant	0.0053		-.0009		
	Cnflc	-0.0009		0.0002		

Indirect Effects of Enforcement on the Cost Performance of Construction Projects (Path-b)

For the indirect effects path *(path-b)*, the obtained coefficient was 0.6437, p-value was 0.0000 ($p < 0.05$) and test of the significant t-value was 11.0717; while, the LLCI and ULCI were 0.5294 and 0.7581, respectively. Accordingly, the effect of the mediating construct (Enfrcmnt) on the dependent construct (CstPerf) was significant ($p < 0.05$), and both the lower and the upper CI values did not include zero [45, 49]

Direct Effects of Conflict of Interest on Cost Performance of Construction Projects after introducing the Mediator in the Model (Path-c')

For the direct effect i.e., *path-c'*, the coefficient of determination obtained was 0.0547, test of statistical significant t-value was 1.7151, p-value was 0.0872 ($p > 0.05$) and LLCI and ULCI were 0.0080 and 0.1175, respectively. Although no zero was involved within the CIs obtained, considering the obtained p-value ($p > 0.05$), the effects of Cnflc on CstPerf after adding the mediator (Enfrcmnt) designate an insignificant influence [50]**.**

Table 2. Effects of the relationship along *path-b & path-c'*

Outcome: CstPerf						
Model Summary						
R	R-sq	MSE	F	Df1	Df2	P
0.8338	0.6953	0.0347	423.2171	2.0000	371.0000	0.0000
Main Model						
	Coeff	Se	T	P	LLCI	LLCI
Constant	0.6829	0.0815	8.3772	0.0000	0.5226	0.8432
Enfrcmnt	0.6437	0.0581	11.0717	0.0000	0.5294	0.7581
Cnflc	0.0547	0.0319	1.7151	0.0872	0.0080	0.1175

Total effects of the Conflict of Interest factors on the Cost Performance of Construction Projects (path-c)

The coefficient of determination for the total effect of Cnflc on CstPer *(path-c)* was 0.3730, which was significant at p = 0.0000 ($p < 0.05$) level of significance, test of statistical significance t-value was 23.3569. The LLCI and ULCI were 0.3416 and 0.4044, respectively. The p-value was significant and also, the C.Is values were significant, having no zero (0) value between the confidence intervals at a 95% level of confidence [45, 49]

Table 3: Process Macro output for the total effects of the Relationship along *path-c*

			Outcome: CstPerf			
			Model Summary			
R	R-sq	MSE	F	df1	df2	p
0.7711	0.5946	0.0460	545.5467	1.0000	372.0000	0.0000
			Main Model			
	coeff	Se	t	p	LLCI	ULCI
Constant	0.7152	0.0938	7.6209	0.0000	0.5306	0.8997
Cnflc	0.3730	0.0160	23.3569	0.0000	0.3416	0.4044
			Covariance matrix of regression parameter estimates			
		Constant		familiarity		
Constant		0.0088		-0.0015		
Cnflc		-0.0015		0.0003		

Measuring the Overall Mediation Effects Based on the Bias-Corrected Bootstrapping

The summary of the total and the direct and indirect effects from the Process macro mediation analysis on the study model is presented in Table 5. The result provided the bias-corrected bootstrap CIs at 95% lower and upper limits on the paths of the model. In this approach, the C.Is levels for the indirect effects were checked to ensure zero was not involved within the limit range [49, 51], and to ensure the indirect effects *(path-a * path-b) or (c − c') ≠ 0* and were significant in relation to the obtained t-value and p-value (Hayes, 2012, 2013a). Contemporary approaches of mediation analysis such as bootstrapping give emphasis to the indirect effects when establishing the mediation occurrence in a research model or study model, irrespective of whether the total effect *(path-c)* of the model is significant or not [45, 52]. The indirect effect can be ascertained either as the product of the *path-a,* and *path-b* coefficients (ab) or by calculating the differences between the total effect *(path-c)* and the direct effect *(path-c')* coefficients *(c − c')*:

i.e., Indirect effect = *(path-a * path-b)*

= (0.4944 x 0.6437) = 0.3183

Alternatively, the indirect effective = difference between total effect *(path-c)* and direct effect (`Path-c')

i.e., (0.3730 − 0.0547) = 0.3183

The indirect effects which were obtained based on the two different mediation options were the same as shown above. Equally, the value for the indirect effect generated automatically by the process macro software as shown in Table 5 remained unchanged (0.3183). Thus, the findings were consistent, and the indirect effect was positive and totally different from zero, which proved the occurrence of mediation in the study model (Hayes, 2012, 2013a). Also, as indicated by Mallinckrodt, Abraham [49], Preacher and Hayes [51], the obtained indirect effect of 0.3183 at the 95% bootstrapped CIs which were 0.0080 and 0.1175 obviously did not include zero. This indicates the occurrence of mediation effect in the study model. Accordingly, this means that, conflict of interest in construction procurement processes among construction procurement stakeholders and project parties in Nigerian public universities had less negative effect on the cost performance of construction projects with the introduction of enforcement as a mechanism of compliance with the procurement manual.

Conclusively, the true indirect effect (0.3183) as shown was different from zero (0) [43, 45], and the bias-corrected bootstrapped LLCI and ULCI within which the indirect effect occurred did not involve zero within the range [49, 51]. Therefore, these findings supported hypothesis 2, that is, the enforcement mechanism mediates the effects of the relationship between conflict of interest among construction procurement stakeholders and construction project cost performances in Nigerian public universities.

Table 4: Summary of the Total, Direct & Indirect Effects of the Study Model

Total, Direct, & Indirect Effects					
Total effect of Cnflc (IV) on CstPerf (DV)					
Effect	SE	t	p	LLCI	ULCI
0.3730	0.0160	23.3569	0.0000	0.3416	0.4044
Direct effect of Cnflc (IV) on CstPerf (DV)					
Effect	SE	t	p	LLCI	ULCI
0.0547	0.0319	1.7151	0.0872	0.0080	0.1175
Indirect effect of Cnflc (IV) on CstPerf (DV)					
	Effect	Boot SE	Boot LLCI	Boot ULCI	
Enfrcmnt	**0.3183**	0.0353	0.2488	0.3858	

Sobel Test Mediation Result

Process macro software generates different mediation outputs based on the chosen model type and the mediation method selected before running the analysis. This study used the fourth mediation model as developed by Hayes [17], and the Sobel test was chosen as a validating mediation approach to confirm the results obtained through the bias-corrected bootstrapped C.Is method as recommended by Hayes [17], MacKinnon, Lockwood [53]. The Sobel test is based on the assumption that the products of the indirect effects *(ab)* are normally distributed; with this method, the standard error of the indirect effect coefficients was estimated based on the Normal theory test. As presented in Table 6, the indirect effect found was 0.3183, Z = 10.667 and p = 0.0000

significance at $p < 0.05$ level of significance. The indirect effect (0.3183) found via the Sobel test remained the same figure for the indirect effect obtained via the bias-corrected C.Is bootstrapping. As presented earlier, using both options, i.e., product of coefficients *(a-path * b-path)* and difference between the total effects and direct effects *(c – c')*, the result which was obtained was 0.3183 as the indirect effect. These proved the consistencies between the two different mediation findings using two distinct methods, and the outcome ultimately proved the mediation occurrence in the hypothesized study model. Hence, enforcement introduced as mediator in the model has mediated the effect of the conflict of interest factors as barriers to compliance with the procurement manual that affect the cost performance of construction projects, positively.

Table 5: Process Macro Sobel Test Mediation Result for the Model

Preacher and Kelley (2011) Kappa-squared				
	Effect	Boot SE	Boot LLCI	Boot ULCI
Enfrcmnt	0.4513	0.0399	0.3631	0.5208
Normal theory test for indirect effects				
Effect	Se		Z	P
0.3183	0.0298		10.6672	0.0000

Figure 2 presents the final mediation model for the study. It shows all the path coefficients linking the constructs together that formed the model. The total effect coefficient *(path-c)* was found to be 0.3730 rightly presented in Figure 2a. The

remaining three effect coefficients of determination for the model paths are presented in Figure 2b; the indirect effects *(path-a, and path-b)* were 0.4944 and 0.6437, respectively, and the direct effect *(path-c')* was 0.0547.
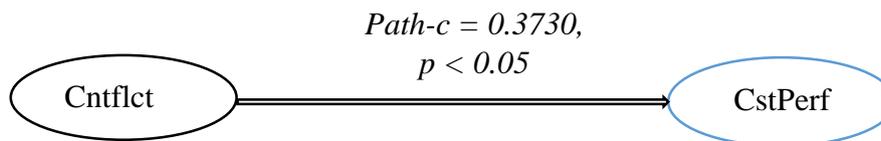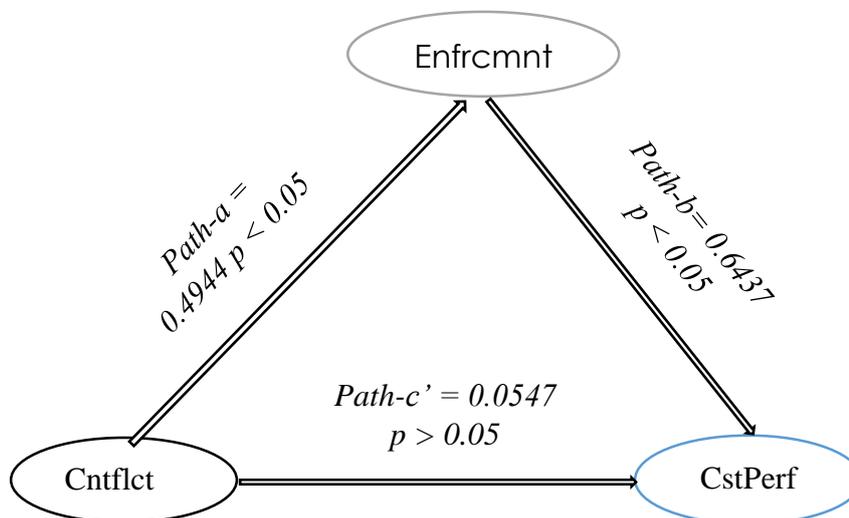
Figure 2a: Total effects of the final mediation model

Figure 2b: Direct & Indirect effects of the Final Mediation Model

Figure 2: Final Mediation Model of the Study

DISCUSSION OF FINDINGS

The mediation results obtained after analysing the data showed a causal relationship between the conflict of interest factors as barriers to procurement manual compliance (independent construct) and the cost performance of construction projects in Nigeria (dependent construct). The coefficient of determination for the causal relationship was = 0.3730, p-value = 0.0000 with a significance at $p < 0.05$ level of significance. The findings indicated that, the conflict of interest factors as barriers to the appropriate compliance with the procurement manual for construction projects have a significant effect on the cost performance of construction projects. This means that, the 0.3730 value obtained as the coefficient of determination explains the magnitude of the effects of the conflict of interest factors on the cost performance of construction projects in Nigerian public universities. Thus, the finding supported hypothesis 1.

A subsequent analysis was carried out using two distinct mediation approaches: the Bias-corrected bootstrapped confidence interval (C.Is) method and the Sobel test method of mediation. The coefficient of determination for the effects of the conflict of interest factors on the cost performance through the mediator (enforcement) was 0.0547 with p = 0.0872. This was not significant at the $p < 0.05$ level of significance; while, LLCI = 0.0080 and ULCI = 0.1175 at the

95% C.Is level were significant having no zero (0) between the C.Is range. The p-value generated by the process macro analysis along the direct effect *(path-c')* proved a non-significant effect entirely because the coefficient of determination which was obtained (0.0547) was positive and totally different from zero at the p-value = 0.0872, which was greater than the 0.05 level of significance selected (Hayes, 2012, 2013a). Equally, both lower and upper C.Is levels did not include zero which proved the mediation occurrence as posited by Mallinckrodt et al. (2006) and Preacher and Hayes (2008). Apart from being significant, the indirect effect *(path-c')* coefficient was obtained at 0.0547, which was significantly lower than the coefficient of determination for the total effects (path-c) which was 0.3730. This showed that after introducing the enforcement mechanism as a mediator into the model, the conflict of interest factors' effects on the cost performance of construction projects was reduced from 0.3730, when tested directly, to 0.0547, when tested through the mediator. Hence, the enforcement mechanism tested as a mediator to improve compliance with the procurement manual minimized, by 0.3183, the effects of the conflict of interest on cost performance. This implied the occurrence of mediation in the study model based on Hayes [17], Hayes [43], Mallinckrodt, Abraham [49], Preacher and Hayes [51], Baron and Kenny [54]. These findings have thus supported hypothesis 2 of the study. Consequently, the main objective

of the study was also achieved, and the findings support earlier research outcomes from Jibrin, Ejura [9], Hui, Radiah [20].

Literature evidence and findings from the field observation during the data collection revealed that, the National Council of Public Procurement (NCPP) as a regulatory commission, which ought to enforce compliance with the procurement manual across all the procurement entities of Nigerian public universities, has yet to be established after almost ten years since the enactment of the Public Procurement Act PPA, 2007 [9, 12]. This has allowed for the proliferation of the conflict of interest among stakeholders and construction project parties, especially at the pre-contract stage, precisely during the bidding process. Projects are awarded based on all kinds of nepotisms, and public procurement administrative bodies like the BPP do not enforce the implementation of the procurement manual or prosecute offenders and violators. During the field survey of this study, it was also noted that some of the respondents interacted with the contractors, and the project consultants were blaming the refusal of the Nigerian federal government for the non-establishment of the NNCP as the major factor responsible for non-compliance with the procurement manual, especially in relation to the conflict of interest. The majority of the construction contractors who participated in the survey expressed willingness to fully comply with the procurement manual if the procurement entities were equally ready to be objective at all stages of the procurement process. Instituting the NCPP to play its role as the Apex procurement administrative body in Nigeria will stimulate the BPP to appropriately monitor the affairs of the procurement entities of the Nigerian public universities, especially ensuring compliance with the procurement manual in construction procurement processes.

CONCLUSION AND RECOMMENDATIONS

This study presented a mediation-based model for compliance with the procurement manual to enhance the cost performance of construction projects in the procurement entities of Nigerian public universities. Procurement manuals are meant to be used by the procurement entities as procurement procedural regulatory manuals or guidelines. Conflict of interest among major procurement stakeholders and project parties in the procurement entities was identified as the major factor affecting the compliance with the procurement manual. This subsequently affects the performance of the project, especially the cost performance. This study evaluated the causal relationship between the conflict of interest factors and cost performance, and further examined the mediating effects of enforcement as a compliance mechanism that mitigates the effects of the conflict of interest factors on the overall cost performance of construction projects in Nigerian public universities. The study concluded that, enforcement as a proposed compliance mechanism mediates the effects of the conflict of interest

factors on the cost performance of construction projects in Nigerian public universities based on the process macro mediation analysis. Enforcement in the form of the threat of legal sanctions will propel a strong compliance consciousness signal to construction procurement stakeholders, professionals, construction project parties, and procurement entities at large. Thus, the study has recommended that the procurement entities of Nigerian federal universities should consider procurement manual enforcement measures and actions, such as penalising defaulters. The study has also recommended the establishment of the National Council of Public Procurement as the apex public procurement administrative body provided by the Nigerian procurement Law.

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