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RESEARCH ARTICLE (PEER-REVIEWED)

Compliance within a Regulatory Framework in Implementing Public Road Construction Projects

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Abstract

The construction industry faces a lack of compliance with policy that in Uganda public road construction projects affects the attainment of Government goals and disrupts infrastructure project delivery. For decades, public entities have been known for a lack of compliance that manifest in: poor performance, poor personnel management, poor resource utilization and unprofessionalism. In Uganda, this has resulted in several restructures aimed at improving service delivery. Despite this, compliance remains an issue. The purpose of this study is to establish factors affecting compliance within a public procurement regulatory framework in public road construction projects and foster economic development. A cross-sectional research design including a structured self-administered questionnaire survey and PLS-SEM data analysis by SmartPLS3 was conducted. The research reveals that three factors

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positively affect compliance with a regulatory framework that govern public road construction projects; sanctions on staff, inefficiency of the public procurement regulatory framework and contractors' resistance to non-compliance. While a further three factors have little positive effect on compliance; familiarity, monitoring activities and professionalism. Hence, the research contributes to construction management by showing that sanctions, perceived inefficiency and contractors' resistance significantly enhance compliance within a public procurement regulatory framework.

Keywords

Compliance; Public Procurement; Regulatory Framework; Road construction.

Introduction

Public procurement is a contractual arrangement between Government and the private sector to deliver infrastructure, goods and services (Frøystad, Heggstad and Fjeldstad, 2010). Most Government's rely on public procurement as a macroeconomic tool for economic development (Davis et al., 2016). For public procurement to achieve economic development, effective and efficient management of procurement activities is paramount (Obicci, 2015). Indeed, public funded procurement is measured against complex and long-term criteria that includes: economic benefit, accountability, transparency and non-discrimination regulation to protect public interests (Basheka and Bisangabasaija, 2010). This is unlike private procurement (Odhiambo and Kamau, 2003). For decades, public entities in Uganda have been known for poor procurement performance. This poor performance has been attributed to a lack of compliance with their public procurement regulatory frameworks and as a consequence the Government of Uganda has initiated restructuring processes and suggested recommendations to improve service delivery (Kakwezi and Nyeko, 2010).

Compliance refers to pursuing Government objectives through appropriate regulatory frameworks (Lisa, 2010; Windapo, 2013). In the context of this research, compliance with public procurement regulatory frameworks means staff implementing public road construction projects adhere to the Public Procurement and Disposal of Public Assets Act (PPDA Act) 2003. Interestingly, transparency and a clear regulatory framework in public road construction projects improves professionalism in contract execution (Ward et al., 2007). Conversely, a lack of compliance for example, poor administration leads to project failures in various guises (White and Fortune, 2002). Whereas a few studies attempted to address a lack of compliance in public procurement, surprisingly, less attention was paid to determine factors affecting compliance in an economically dependable road construction subsector (Amann et al., 2016). The study aims to bridge this research gap by determining compliance factors with particular emphasis on Uganda's road subsector. To address this problem, the study adopted a literature review approach widely applied to identify factors across research fields (Bruton, Ahlstrom and Li, 2010; DiMaggio and Powell, 1991; Fayezi, O'Loughlin and Zutshi, 2012). The balance of this research is organized as follows; literature review, methodology, results, discussion and conclusion.

Literature Review

A comprehensive literature review was carried utilising appropriate key words in the domain of public procurement, regulatory compliance and construction projects. Published research

in peer-reviewed journals were retrieved from databases that included; Scopus, Google Scholar, Science direct search engines. The literature search produced over 700 journal articles and public reports from a period of 1987 to 2018. In this process, common factors affecting compliance in different fields were identified including; familiarity, monitoring, professionalism, sanctions, perceived inefficiency and contractors' resistance (DiMaggio and Powell, 2015; Gelderman, Ghijsen and Schoonen, 2010; Mwakibinga and Buvik, 2013; Tabish and Jha, 2015). Noteworthy, the literature review identified few studies that investigated compliance in public procurement without a focus on road construction projects. Public procurement regulatory frameworks aim at promoting fairness, transparency, accountability and value for money with efficient and effective procedures benefiting all stakeholders (Agaba and Shipman, 2007; Davis et al., 2016; PPDA Authority, 2003). However, enforcing compliance with public procurement regulatory framework is challenging (PPDA Authority, 2016). Promoting compliance, needs to establish the root cause of noncompliance in procurement contracts. For example, procurement outside contractual agreements costed GlaxoSmithKline between US\$80 to 120 million (Kulp et al., 2006). Relatedly, increased accidents in the construction sector are attributed to lack of compliance with safety measures (Melzner et al., 2013). A lack of compliance is caused by; self-interest, weak enforcement mechanisms and inefficient regulatory frameworks, unprofessional behaviour among others. The outcome is failing to meet Government goals and project success (Mwakibinga and Buvik, 2013). The following sections present specific details on the factors that affect compliance (See Table 1) and ends with respective hypotheses.

FAMILIARITY WITH REGULATORY FRAMEWORK

Familiarity refers to knowledge of an entire regulatory framework, its process and procedures. Hunja (2003) suggests that despite academic qualifications, procurement officers lack knowledge in interpreting technical sections of public procurement documents. This is exacerbated by complex public road construction projects with numerous stakeholders and a myriad of interconnected policies. Consequently, procurement personnel require orientation on emerging issues that on some occasions would require concomitant attitudinal change (Chi and Nicole Javernick-Will, 2011; Kaluarachchi and Jones, 2007). Accordingly, familiarity with regulatory frameworks governing road construction projects is important and action for improvement through industry education and training is required (DiMaggio and Powell, 2015). Furthermore, an absence of familiarity with organizational structures and governance mechanism has caused capacity problems Hunja (2003) and in the case of Bangladesh, it has eventuated in the country failing to meet public procurement goals (Mahmood, 2010).

Similarly, in Uganda National Roads Authority's (UNRA) end of 2013/2014 performance workshop, a lack of familiarity with the roads management system was raised as hampering compliance with their objectives (Uganda National Road Authority, 2014). This notion is supported by reports identifying that familiarity with rules increases compliance with formal documentary elements (Gelderman, Ghijsen and Brugman, 2006; McNutt and Rossi, 2010). To conclude, three pertinent examples are offered; the Netherland's municipalities experienced non-compliance with procurement procedures due to a lack of familiarity with procurement process itself (de Boer and Telgen, 1998). Similarly, in Nigeria's public construction sector, misconceptions and a lack of familiarity with procurement policies significantly affected compliance (Zadawa, Hussin and Osmadi, 2015) and finally reports showed a lack of familiarity with regulatory framework significantly affected compliance with Procurement Act in Kenya's public secondary schools' sector (Migosi et al., 2013).

MONITORING ACTIVITIES

Monitoring activities is an organizational governance mechanism that ensures staff meet goals. Forsythe (2015); Isaac and Navon (2014) observed that continuous monitoring of construction projects improves productivity by taking corrective actions that promote compliance in procurement systems (Basheka, Oluka and Mugurusi, 2012). Considering an agency theory perspective, monitoring road construction projects is equally essential in enforcing compliance and meeting Government goals (Van Slyke, 2007). This is inevitable for public road implementation because constant monitoring of staff compels them to discount unethical interest to pursue organizational goals (DiMaggio and Powell, 2015). Despite such positive suggestions, Rutherford, Buchholtz and Brown (2007) revealed that monitoring alone does not influence agent behaviour that affects compliance with regulatory frameworks (Peprah, 2015). Interestingly, Kauppi and van Raaij (2015) discovered that monitoring does not influence agent actions in meeting principal's goals and is an insignificant factor in implementing public construction projects (Tabish and Jha, 2015). Convincingly, reports show that strict monitoring ensured compliance in construction and rehabilitation of nursing schools funded by European Union (Kakitahi, Landin and Alinaitwe, 2013). The same article attributes rework in Uganda's public construction projects to inadequate supervision that required monitoring to improve contract performance (Oluka and Basheka, 2014). This suggests on-site project monitoring by different stakeholders is important to enhance compliance in construction projects (Deng et al., 2014) and requires compliance with regulatory frameworks (Sweis et al., 2014).

PROFESSIONALISM

Professionalism refers to competence in skills, special knowledge with experience and membership of a professional body that exhibits an ethical code (Watson, 2002). Tombesi (2012) adds that professionalism arises from established ways of doing things, for example: architectural innovations and technical expertise. Consequently, project actors are focused on professionalism through professional bodies and code of conduct to ensure compliance in the construction industry (McCarthy, 2012; Sohail and Cavill, 2008). Accordingly, PPDA Authority (2016) suggests training and instilling ethical standards among procurement stakeholders to promote professionalism in public road construction projects and could be boosted through academic qualifications, skills and networking (DiMaggio and Powell, 2015). Despite such recommendations, professionalism insignificantly enhanced compliance in public procurement (Eyaa and Oluka, 2011). Further, more pertinent examples showed that lack of professionalism among public officers affected compliance (de Boer and Telgen, 1998). Similarly, in China's construction industry, a lack of professionalism affected compliance with regulatory frameworks Deng et al. (2014) and in Malaysia, reports showed a lack of professionalism affected public construction projects. In this example, public officers revealed Government prices to preferred contractors whilst selecting quotations in open tendering (Shu Hui et al., 2011). Such an attitude of accepting bribes and sharing fraudulent gains hampered confidentiality (Shu Hui et al., 2011). Noteworthy, the literature review revealed that some procurement officers demanded contractors' adherence to contract specifications by upholding professional integrity and their ethical code. The act promoted compliance with their respective public procurement regulatory framework.

SANCTIONS

Ineffective punitive measures affect compliance in public procurement. This leads to Governments losing significant funds, especially in public road construction subsector (Agaba and Shipman, 2007; PPDA Authority, 2009). Enforcing sanctions in road construction subsector encourages staff to comply with regulatory frameworks and governance (Agaba and Shipman, 2007; Wirick, 2009). For example, in Ghana, imposing sanctions on procurement officers engaging in maverick buying, enhanced compliance with a Public Procurement Act (Peprah, 2015). Sanctions suggests negative incentives, including threats and punishments/ penalties imposed on violators of a particular regulatory framework. Sanctions make violators plot/scheme how they may prevent and conceal detection of their wrong doing (Zubic and Sims, 2011). Bowen, Edwards and Cattell (2012) noted that an absence of sanctions in the construction industry affects compliance. The suggestion being that the complexity of construction projects exacerbated the problem. This notion is supported by reports showing that weak sanctions enforcement mechanisms have affected compliance with regulatory frameworks and hampering Government objectives (Okeahalam, 2004). Imposing legal sanctions on road construction teams to improve regulatory compliance should be applied cautiously (Gunningham and Kagan, 2005). Whilst Shu Hui et al. (2011) suggest enforcing strict penalties including cutting public officers' salaries and confiscating their property could enhance compliance with the public procurement regulatory frameworks.

PERCEIVED INEFFICIENCY OF PUBLIC PROCUREMENT REGULATORY FRAMEWORK

The Ugandan Government has prioritized funding the road subsector as a vehicle for economic transformation (Ministry of Works and Transport, 2015). To achieve this, loopholes, e.g. unclear national construction standards within a regulatory framework may be manipulated for personal interest (PPDA Authority, 2008). A regulatory framework designed to facilitate procurement activities in an accountable and transparent manner to achieve value for money is required (Agaba and Shipman, 2007). This notion is supported by institutional theory that emphasises compliance with an efficient regulatory framework (Greenwood and Hinings, 1988). Convincingly, a lack of compliance in the construction industry is attributed to perceived inefficiency of regulatory frameworks (Styhre, 2011). For example, in the Netherlands EU directives were flouted because they were perceived inefficient (Gelderman, Ghijsen and Brugman, 2006). Such inefficiencies exist in Uganda's public procurement regulatory framework. For example, contract price variations are common in road construction projects beyond an allowable range of 20-30 % (PPDA Authority, 2003). Similarly, a lack of compliance is attributed to an inefficient public procurement regulatory framework in East Africa (Odhiambo and Kamau, 2003). These challenges affect compliance with the regulatory frameworks governing road construction projects. An inefficient public procurement regulatory framework could encourage unethical behaviour that cost taxpayer significant funds (Ntayi et al., 2010).

CONTRACTORS' RESISTANCE TO NON-COMPLIANCE

Implementing public road construction projects requires a team effort and compliance with governing regulatory framework is important (Scott, 2005). Contractor's resistance refers to contractors rejecting bad decisions by public officers regarding implementation processes. Compliance in implementing public road construction projects is promoted if contractors act against deviant public officers (Gelderman, Ghijsen and Schoonen, 2010).

This is because contractors can influence project outcome through their professional skills (Hemström, Gustavsson and Mahapatra, 2017). Institutional theory supports the notion that compliance is affected by resistance from different players with varying ambitions and means of accomplishing tasks (Kondra and Hinings, 1998). However, contractors' resistance depends on their knowledge of the regulatory framework governing public road construction projects. Contractors use the knowledge to report deviant officers that compels them to comply with regulatory framework because they fear being exposed. Pachnou (2005) cautions contractors to balance between winning and losing cases due to inefficiencies in remedy mechanism. Contractors are unwilling to report public officers if the remedy enforcement mechanism that affects compliance with regulatory frameworks is weak.

MAGNITUDE OF THE PROBLEM

A lack of compliance was reported in the construction public sector that resulted in extra cost and wasted time in procurement (Lind and Bruner, 2014). Examples include; poor implementation plans, substandard work, a high contract price, variations and schedule overruns in the construction and engineering industry (Golden and Picci, 2006; Ramanathan, Narayanan and Idrus, 2012). Further, in international research these factors have been reported to account for annual loss of US\$258.6 million (AU\$ 351.696M) (Agaba and Shipman, 2007). Interestingly, reports show that compliance with regulatory frameworks in public procurement is reducing despite efforts to enforce improvement strategies through capacity building (PPDA Authority, 2012). Since the PPDA Act 2003 was enacted, several reforms have taken place as a consequence of the current PPDA amendments 2014. These were aimed at strengthening the Act to achieve value for money (VFM). Despite this, a lack of compliance persists. For example, the Busega-Masaka (51Km) road project lost significant funds (with 52% contract price variations) and completion was delayed by three years (Uganda National Road Authority, 2014). Additional examples showing lack of compliance are Kanoni-Ssembabule-Villa Maria (120KM) and Hima-Katunguru (58KM) road construction projects where UGX322 billion (AU\$87M) is being investigated for procurement irregularities. The Ugandan parliament has ordered an investigation on 28 on-going road construction projects (New Vision, 2016). Whereas few studies attempted to address lack of compliance in public procurement, little is known about enforcing compliance in public road construction subsector. Hence, with evidence of anomalies facing public road project implementation, call for research to establish factors affecting compliance with public procurement regulatory framework governing public road construction projects (Eyaa and Oluka, 2011).

From the literature review and identified problem, six hypotheses are developed:

- H1.** Familiarity with public procurement regulatory framework increase compliance with public procurement regulatory framework.
- H2.** Monitoring activities on public road construction projects increase compliance with public procurement regulatory framework
- H3.** Professionalism of staff in public road construction projects increase compliance with public procurement regulatory framework
- H4.** Sanctions on staff in public road construction projects increase compliance with public procurement regulatory framework
- H5.** Perceived inefficiency of public procurement regulatory framework reduces compliance with public procurement regulatory framework.

H6. Contractors' resistance to non-compliance with public procurement regulatory framework by public officers increases compliance with public procurement regulatory framework.

RESEARCH MODEL

A two step-process was used in formulating the research model. From a traditional literature review, compliance factors were identified and grouped into four major categories, which were environmental, organizational, project and individual factors. A second step involved analyzing and interpretation that enabled merging/eliminating similar factors. This process resulted in six compliance factors that determined compliance with public procurement regulatory framework as reflected in Figure 1. Reducing factors helps in an in-depth understanding of study phenomenon as many factors are time consuming and waste resources (Collin, 2002). Respective measurement items were identified and presented in Table 1. These indicators were adopted from previous studies and modified to fit the current study.

Table 1 Factors that Affect Compliance and Measurement Indicators

Factors	Measurement indicators
Familiarity (Eyaa and Oluka, 2011; Gelderman, Ghijssen and Brugman, 2006; Mwakibinga and Buvik, 2013).	F1. The regulatory framework governing public road construction projects is precisely written for easy interpretation. F3. Only staff who are familiar with implementation of public road construction projects are used. F13. Staff with appropriate academic qualification are employed on applicable road construction projects.
Monitoring activities (Mwakibinga and Buvik, 2013; Rokkan and Buvik, 2009).	M4. Frequent inspections checking on timely recording of project progress. M13. Frequent inspections ensuring timely project completion. M14. Frequent inspections to prevent damage. M15. Frequent inspections to prevent theft.
Professionalism (Basheka and Mugabira, 2008; Eyaa and Oluka, 2011).	PR3. Staff high professional integrity. PR18. Professional judgement during decision making. PR19. Practical experience in road construction. PR20. Required expertise in road construction. PR21. High level of confidentiality.
Sanctions (Mwakibinga and Buvik, 2013; Payan and McFarland, 2005).	S7. Penalties imposed on those found guilty without any warning. S8. Sanctions are implemented in secret. S9. Sanctions with negative consequences are imposed.

Table 1 continued

Factors	Measurement indicators
Perceived inefficiency (Gelderman, Ghijsen and Schoonen, 2010).	PI1. Ban on negotiation between contractors and public officers during road construction. PI2. Ban on contract extension beyond agreed schedule. PI3. Ban on underperforming contractors.
Contractors' resistance (Gelderman, Ghijsen and Schoonen, 2010; Gelderman, Ghijsen and Brugman, 2006).	CR1. Contractors' readiness to act against bad decisions. CR2. Contractors' knowledge on public road procurement process.
Compliance (Gelderman, Ghijsen and Brugman, 2006; Mwakibinga and Buvik, 2013; Payan and McFarland, 2005).	CP1. Proper authorization of road construction projects. CP2. Timely delivery of road construction projects. CP3. Timely recording of road construction transactions. CP10. Achievable road construction project objective.

The final model illustrates the relationship between six compliance factors (Independent variables) and compliance with public procurement regulatory framework (Dependent variable) represented by H1-H6 as depicted in Fig1.

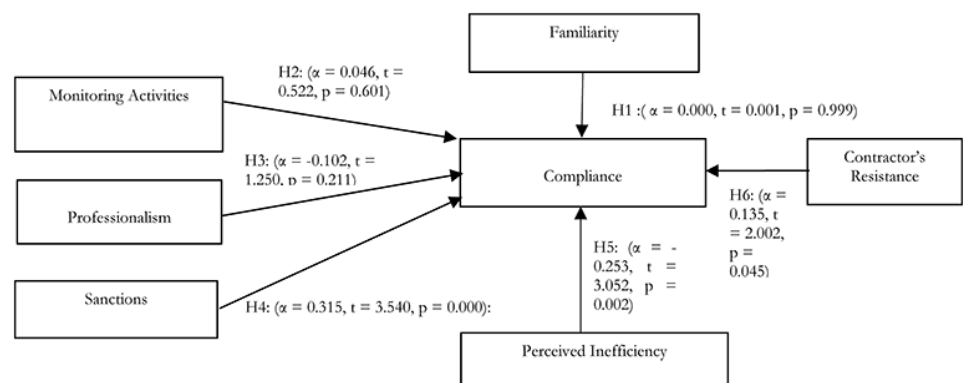


Figure 1 Validated model. (Source: Authors)

Research Method

A deductive research approach was adopted due to its ability in testing hypotheses for constructs relationships' direction, strength and variance through statistical techniques (Saunders, 2012). This was enabled through linkages between seven study variables representing causal relationships (H1-H6).

RESEARCH DESIGN

A cross-sectional research design with a quantitative approach was adopted because it can link data to hypotheses, model development and generalizing results (Barratt and Kirwan, 2009).

Additionally, its statistical techniques are good for accuracy, validity, reliability, generalizability and objectivity compared to qualitative (Mwakibinga and Buvik, 2013; Sekaran and Bougie, 2010). A comprehensive literature review of peer-reviewed journals and public documents was performed via Scopus, Google Scholar, Science direct and Google search engines and seven study variables were established as depicted in Fig 1. A structured questionnaire covering these variables was developed with respective measurement indicators adopted and modified from previous studies. These indicators were anchored on a five-Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree).

A population of 1300 in five entities from Uganda was considered. Uganda was selected because of reports of procurement irregularities facing road subsector that is heavily donor funded. A sample of 299 was obtained following (Krejcie and Morgan, 1970). Proportionate stratified random sampling was used to select respondents from respective departments of participating entities. Majority of respondents hold a first degree and above (93.8%), in the position of officer/manager and higher (84.4%) and have work experience beyond two years. The questionnaires were physically delivered with the help of research assistants recruited. Follow-up reminders through telephone calls were made before collecting 194 completed questionnaires representing approximately 65% response rate.

VALIDITY AND RELIABILITY

The questionnaire was piloted with selected procurement officers in New South Wales Australia for clarity and relevance. This enabled validating the questionnaire by rewording and deleting ambiguous statements. Through Smart-PLS3 software, PLS-algorithms with factor analysis was conducted to obtain measurement indicators. This software was considered because its techniques are robust in handling non-normal data and simultaneous analysis unlike other software. Composite reliability was used to test for internal consistence because it assumes more accurate parameter estimation than Cronbach alpha (Chin, 2010). Convergent validity was determined through Average Variance Extracted (AVE) (Hair et al., 2012a). Discriminatory validity was determined through a reliable Heterotrait-Monotrait Ratio (HTMT) (Hair et al., 2017; Rasoolimanesh et al., 2017).

DATA CLEANING AND ANALYSIS

The analysis focused on research hypotheses within research objective. This was enabled by estimating Partial Least Square-Structural Equation Model (PLS-SEM) in Smart-PLS software. Data was captured in excel programme and imported into SPSS24 and Smart-PLS3 for screening to ensure completeness and accuracy. Whereas PLS-SEM is flexible with less stringent constraints, some level of data screening was necessary before model estimation (Henseler, Ringle and Sinkovics, 2009). Screening enabled checking and handling reliability, validity, multi-collinearity, normality, outliers and missing values. This purification process was majorly concerned with obtaining final measurement indicators with high inter-correlation for internal consistency (Diamantopoulos and Siguaw, 2006).

Uni-dimensionality: Uni-dimensionality was handled by determining discriminant validity by assessing HTMT values to determine construct validity (Kline, 2015).

Collinearity: Extreme collinearity was solved by running PLS-algorithms and verifying Variance Inflation Factor (VIF).

Outliers: Outliers was solved by performing descriptive analysis and converting extreme scores to a value equal to next most extreme score that is within three standard deviations of

the mean. The Z score was used with the condition: $Z \geq \pm 2.5$ (i.e. $Z \geq -2.5$, implies extreme low value and hence add 1 to that value, $Z \geq 2.5$, implies high extreme value and hence subtract 1 from that value).

Missing data: Available case method was adopted to handle missing data by running frequencies for each questionnaire items. Two questionnaires with 84.8% total missing data were removed from analysis to prevent distorting relationship prediction (Hair et al., 2014). Hence, usable questionnaires were 192.

Normality test: Fairly normal distribution is recommended for PLS-SEM to produce strong significant results (Henseler, Ringle and Sinkovics, 2009). Normality test was performed based on Skewness and Kurtosis.

PATH COEFFICIENTS AND SIGNIFICANCE LEVELS

PLS-Algorithms was performed to identify the model and predict the relationships among study variables. This was achieved by evaluating path coefficients whereby values above 0.1 indicate independent variables are well represented and model identified (Gefen, Straub and Boudreau, 2000; Hair et al., 2012a). While bootstrapping was run with 5000 bootstrap samples to determine prediction significance. This was based on to accept and reject stated hypotheses. Analysis converged at 11 interactions far below pre-set 300-stop criterion implying good convergence and prediction. Model predictive relevancy and fitting were respectively determined through the coefficient of determination and Standardized Root Mean Square Residual (SRMR) after running PLS-algorithms and bootstrapping (Ringle, Wende and Becker, 2015).

Results

This section presents respective results of Structural Equation Modelling (SEM) based on research objective and hypotheses. It begins with preliminary analysis results for measurement model assessment, followed by structural model assessment through collinearity, path coefficient significance, coefficient of determination (R^2) and model fit. All composite reliability coefficients are above 0.7 proving good internal consistence while indicator loadings are above 0.6 depicting sufficient construct representation (see Table 2 & 3). All AVE values are greater than 0.5 showing that the latent construct explains more than 50% variance of its measurement indicators representing sufficient convergent validity as presented in Table 2 (Urbach and Ahlemann, 2010). While HTMT values are less than 0.8 demonstrating good discriminant validity as depicted in Table 4 (Hair et al., 2017). All VIF values are far below 5 as depicted in Table 2 implying extreme collinearity was not a problem (Hair et al., 2012b). Skewness and kurtosis statistics for all study variables are respectively within acceptable limits of ± 3 and ± 5 exhibiting fairly normal distribution as depicted in Table 5 (Jondeau and Rockinger, 2003). The preliminary results presented in Table 2-5 imply that measurement model is sufficient and suitable to conduct structural model assessment.

Table 2 Reliability test results

Variable	Composite Reliability (ρ_c)	AVE	VIF
Familiarity	0.792	0.560	1.348
Monitoring activities	0.830	0.555	1.462

Table 2 continued

Variable	Composite Reliability (ρ_c)	AVE	VIF
Professionalism	0.838	0.509	1.602
Sanctions	0.798	0.576	1.434
perceived inefficiency	0.817	0.599	1.528
Contractors' Resistance	0.802	0.560	1.273
Compliance	0.840	0.572	

Table 3 Outer loadings

	Compliance	Contractors' resistance	Familiarity	Monitoring	Perceived inefficiency	Professionalism	Sanctions
CP1	0.895						
CP 10	0.727						
CP2	0.663						
CP3	0.719						
CR1		0.856					
CR2		0.779					
F1			0.746				
F13			0.675				
F3			0.818				
M13				0.597			
M14				0.858			
M15				0.820			
M4				0.675			
PI1					0.730		
PI2					0.845		
PI3					0.742		
PR 18						0.682	
PR19						0.686	
PR 20						0.714	
PR 21						0.791	
PR3						0.690	

Table 3 continued

	Compliance	Contractors' resistance	Familiarity	Monitoring	Perceived inefficiency	Professionalism	Sanctions
S7							0.812
S8							0.862
S9							0.569

Table 4 Heterotrait-Monotrait Ratio

	Compliance	Contractors' resistance	Familiarity	Monitoring	Perceived inefficiency	Professionalism	Sanctions
Compliance							
Contractors' resistance	0.378						
Familiarity	0.195	0.501					
Monitoring	0.180	0.460	0.524				
Perceived inefficiency	0.555	0.602	0.451	0.249			
Professionalism	0.140	0.518	0.650	0.691	0.340		
Sanctions	0.572	0.453	0.381	0.389	0.769	0.335	

Table 5 Skewness and Kurtosis results

		Familiarity	Monitoring Activities	Professionalism	Sanctions	Perceived inefficiency	Contractors' Resistance	Compliance
N	Valid	192	192	192	192	192	192	192
	Missing	0	0	0	0	0	0	0
Mean		3.5874	3.5592	3.5187	3.4544	2.9427	3.7161	3.2054
Std. Deviation		.53441	.56945	.44215	.52716	.98249	.82747	.69980

Table 5 continued

	Familiarity	Monitoring Activities	Professionalism	Sanctions	Perceived inefficiency	Contractors' Resistance	Compliance
Skewness	-.345	-.545	-.063	.086	-.018	-.699	.069
Kurtosis	-.333	.973	.277	-.328	-.331	.266	-.619

Table 6 R² and SRMR

	Original Sample (O)	P Values
Compliance (R ²)	0.279	0.000
SRMR	0.068	0.000

Discussion

This section discuss relationship between study variables showing accepted/rejected hypotheses, coefficient of determination and model fit.

FAMILIARITY AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is an insignificant relationship between familiarity with regulatory framework governing public road construction projects and compliance ($\alpha = 0.000$, $t = 0.001$, $p = 0.999$) at 5% significance level. Implying that familiarity did not predict compliance and management should not prioritise increasing their staff familiarity with the procurement regulatory framework. Hence, familiarity does not increase compliance with public procurement regulatory framework and H1 is not supported. The findings contradict earlier studies that found that familiarity significantly predicted compliance in public procurement (Eyaa and Oluka, 2011). This may be a result of involving highly qualified staff since 93.8% are graduates with working experience of more than two years. Previous reports showed lack of familiarity as hampering compliance with Uganda National Roads Authority objectives (Uganda National Road Authority, 2014). Considerable efforts could have been made to rectify the situation that implies staff familiarity with regulatory framework governing road construction projects is no longer a challenge compared to the past reports from previous studies. Familiarity was measured by using staff who are familiar with project implementation and employing staff with appropriate academic qualification.

MONITORING ACTIVITIES AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is an insignificant inverse relationship between monitoring activities and compliance ($\alpha = -0.046$, $t = 0.522$, $p = 0.601$) at 5% significance level. This implies that monitoring activities did not predict compliance with public procurement regulatory framework.

Management should not prioritise monitoring public road construction projects aimed at increasing compliance. Monitoring activities do not increase compliance and H2 is not supported corresponding to (Rutherford, Buchholtz and Brown, 2007; Tabish and Jha, 2015). However, these findings are contradictory to theories proposing effective monitoring mechanism (Kauppi and van Raaij, 2015). This is attributed to various monitoring agencies involved in road implementation. Despite inconsistencies between previous studies, the findings show that staff are aware of Government monitoring mechanism in place that compel them to comply impliedly. However, management should not ignore significant indicators measuring monitoring activities namely; frequent inspections for timely recording of project progress, timely project completion and proper storage methods.

PROFESSIONALISM OF STAFF AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is an insignificant inverse relationship between professionalism of staff and compliance ($\alpha = -0.102$, $t = 1.250$, $p = 0.211$) at 5% significance level. Implying that professionalism of staff does not predict compliance and H3 is not supported. This corresponds to earlier studies where professionalism was insignificant in enhancing compliance among public entities (Eyaa and Oluca, 2011). However, management should encourage high staff professional integrity, professional judgement during decision-making, high level of confidentiality, employing practically experienced road construction staff with required expertise since these were key indicators measuring professionalism. Professionalism is emphasized in organizational performance (DiMaggio and Powell, 2015). Current findings are consistent with previous studies implying that management has continuously encouraged professionalism in public sector that is adopted by road construction subsector. This is due to over 55% of staff are registered by various professional bodies. Furthermore, professionalism is well attained with current higher procurement qualifications offered by universities in Uganda and empowerment of professional bodies enforcing respective professional codes.

SANCTIONS AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is a significant positive relationship between sanctions on staff and compliance ($\alpha = 0.315$, $t = 3.540$, $p = 0.000$) at 1% significance level. Implying that sanctioning staff on public road construction projects predicted compliance with public procurement regulatory framework. This requires management to continuously punish and apprehend staff found guilty during project implementation. Increasing penalties on road construction team are effective in achieving compliance. Hence, sanctions increase compliance with public procurement regulatory framework and H4 is significantly supported. This confirms earlier studies proposing the use of sanctions in achieving compliance (Mwakibinga and Buvik, 2013; Scott, 2013; Wirick, 2009). The findings are in line with previous reports because sanctions create fears among road construction team when apprehended. Managers can impose sanctions with negative consequences, penalize guilty staff without warning and imposing sanctions to enforce compliance.

PERCEIVED INEFFICIENCY AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is an inverse significant relationship between perceived inefficiency and compliance ($\alpha = -0.253$, $t = 3.052$, $p = 0.002$) at 1% significance level. Implying that perceived inefficiency

of public procurement regulatory framework reduces compliance with this regulatory framework. Hence, H5 is significantly supported. Banning negotiation between contractors and public officers during road construction, banning contract extension beyond agreed period and banning underperforming contractors are effective in achieving compliance during project implementation. These were key indicators measuring perceived inefficiency of public procurement regulatory framework. Management should enforce these indicators that define how well regulatory framework governing public road construction projects is efficient and effective. However, if these indicators are not emphasized, the regulatory framework will be perceived inefficient with loopholes for manipulation. The findings are aligned with institutional theory contending that efficient organizational norms determine compliance for organization's performance (Greenwood and Hinings, 1988). However, they contradict earlier studies that found an insignificant relationship between the two factors using a sample from Netherlands municipalities (Gelderman, Ghijsen and Brugman, 2006). Despite this contradiction, current findings are supported by institutional theory implying that implementing public road construction projects requires an efficient and effective regulatory framework to achieve Government objectives.

CONTRACTORS' RESISTANCE AND COMPLIANCE WITH PUBLIC PROCUREMENT REGULATORY FRAMEWORK

There is a significant positive relationship between contractors' resistance and compliance ($\alpha = 0.135$, $t = 2.002$, $p = 0.045$) at 5% significance level. Implying that contractors' resistance to non-compliance predicted compliance with public procurement regulatory framework. Management should empower contractors' by creating awareness to understand the consequences of not following the right regulatory framework governing public road construction projects. This can be achieved by increasing contractors' knowledge on public road procurement process and encouraging them to act against deviant public officers as key indicators measuring contractors' resistance to effectively achieve compliance. Hence, contractors' resistance to non-compliance increases compliance with public procurement regulatory framework and H6 is significantly supported. Institutionally, different players can resist others with specific reasons for doing the right thing at their knowledge and experience (Greenwood and Hinings, 1996). Contractors have the right to resist bad decisions from public officers since failing to meet project requirements may affect its implementation and in turn affect winning future contracts. The findings are contradicting Netherland's study that found contractors' resistance not influencing compliance in public procurement (Gelderman, Ghijsen and Schoonen, 2010; Gelderman, Ghijsen and Brugman, 2006). This contradiction could be attributed to the fact that contractors' resistance is an emerging factor that needs persistent testing across sectors. Nevertheless, the current findings are encouraging since they are in line with institutional theory.

COEFFICIENT OF DETERMINATION (R²) AND MODEL FIT

The PLS-algorithm and bootstrap results reveal that coefficient of determination for compliance with public procurement regulatory framework model's explained variance is significantly good as depicted in Table 6 ($R^2 = 0.279$, $p < 0.001$). This shows sufficient model predicative power (Gefen, Straub and Boudreau, 2000; Hair et al., 2012a). In addition, SRMR shows that the model is fitting well since it is within acceptable threshold of ≤ 0.08 see Table 6 (SRMR = 0.068, $p < 0.001$) (Hu and Bentler, 1999; Kline, 2015).

Implication and Knowledge Contribution

The findings show that sanctions, perceived inefficiency and contractors' resistance are significant factors determining compliance with public procurement regulatory framework. While familiarity, monitoring activities and professionalism are not predictors of compliance with a public procurement regulatory framework. These results are compared with the findings of Mwakibinga and Buvik (2013) where monitoring and sanctions were supported when applied separately, but when increasing monitoring was applied, the imposition of sanctions was reduced. Accordingly, this study contributes to existing construction management and public procurement studies generally and particularly in public road construction by showing that sanctions on staff, perceived inefficiency of public procurement regulatory framework and contractors' resistance to non-compliance with public procurement regulatory framework are significant compliance factors in enhancing compliance with public procurement regulatory framework governing public road construction projects. Theories that underpin these factors, to achieve compliance are provided by (Greenwood and Hinings, 1988; Van Slyke, 2007). Eradicating inefficiencies within a regulatory framework and enforcing effective sanctions, empowering contractors to take actions against deviant public officers through effective and efficient mechanisms would enhance compliance in public road construction projects. Hence, increased quality paved road network and boosting economic development.

Conclusion

The study's purpose was to establish factors affecting compliance within public procurement. A validated compliance model to guide management was established. The findings show that sanctions on staff, perceived inefficiency of regulatory framework and contractors' resistance are significant factors that enhance compliance with a public procurement regulatory framework when implementing public road construction projects. Enforcing these factors effectively would save significant funds that Governments globally can use to increase paved road network and steer economic development. In addition, creating awareness and reconfiguring enforcement mechanisms and effective penalties would increase trepidation among staff. A potential outcome is a useful framework and attainment of Government goals. Sanctions including contract termination, suspension, confiscation of property and non-payments are recommended to enhance compliance and achieve value for money. Regular transfers and rotation of staff are encouraged to curb unethical behaviours (Obanda, 2010). This is an indirect sanctioning measure to eradicate collusion associated with over staying in one position or workstation. Additional punitive measures may include, but not be limited to; demotion, prison sentences, confiscation of property of those found guilty and introducing attractive rewarding schemes for performing staff (Shu Hui et al., 2011).

The Government should consider banning; negotiations during project implementation, extending contracts beyond agreed schedule and underperforming contractors. These policies would ensure a clear and efficient public procurement regulatory framework capable of meeting respective Government goals. Additionally, governing regulatory framework should be explicitly written in plain language for ease of interpretation. Furthermore, empowering contractors' knowledge of public procurement regulatory framework and acting against bad decisions by public officers could control deviant officers during a project's implementation. Despite these interesting findings, it is noted that the study focused on Uganda and these findings may be cautiously applied globally. Secondly, a cross-sectional research design based on a close ended questionnaire was adopted. This limited the scope of responses to a particular

time. Hence, a longitudinal study blended with interviews would be appropriate in the future. Scholars should investigate further and apply additional factors for a comprehensive compliance model. Finally, with limited studies using perceived inefficiency and contractors' resistance factors, further empirical studies are encouraged to confirm their significance in different sectors worldwide. Irrespective of country's jurisdiction, public construction projects are faced with similar procurement irregularities that affect project implementation (Kling, 2008). Given these similarities and as a consequence of the pilot study using the Australian construction sector, the current study findings could be applied cautiously beyond Uganda's road construction subsector.

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