LINKING CLIENTS, CONTRACTORS, PROJECT MANAGEMENT AND TRANSACTION COSTS MAGNITUDE IN CONSTRUCTION PROCUREMENT IN NIGERIA

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ABSTRACT

Project stakeholdersand management efficiency have been regarded as the main variables responsible for high transaction costs in construction project procurement in Nigeria. Additionally, investigations of their effects on transaction costs are relatively few in North-Western, Nigeria. This paper attempts to determine the impact of clients, contractors' attitudes and the effectiveness of project management on the magnitude of transaction costs (TC) and to determine the significance of such impacts on TC. In order to achieve the objectives, a field survey involving a sample size of 100 procurement expert participants drawn from contracting public and private for procurement of works, services, and goods were employed, using structured questionnaires. Partial least square structural equation modeling (PLS-SEM) was used in analysing the information gathered. The research shows that both client and contractor unethical attitudes towards building procurement influence the transaction costs of each party. Similarly, the effectiveness of project management was useful, but not significant for the TCs. The research concludes that parts of the responsibility of the owners in the transaction are to strengthen mutual knowledge, collaboration and amicable dispute resolution, and mutual relationship with other procurement stakeholders.

Keywords: Attitude, Construction, Public procurement Act 2007, Project management, PLS-SEM, Transaction costs.

1. Introduction

The building industry in every economy is a crucial sector as its outputs and procedures in the industry have major effects on other sectors'development, such as: schooling, production, agriculture, telecommunications, actual property transactions (Adeagbo, 2014; Dalrymple, Boxer, and Staples, 2006). Due to its important effect on other sectors' effectiveness and productivity, it becomes an essential component in financial assessment (Danso, 2010; Ofori, 2005; Timiniyi, Wolemi, Ibi, and Jonathan, 2015). Indeed, it is one of the industries that deliver vital or critical financial growth performance (Adeagbo, 2014; Anaman and Osei-Amponsah, 2007; Kenny, 2007; Timiniyi et al., 2015). This represents 7-10% of the world's Gross Domestic Product (GDP) (Vernikos, Goodier, Gibb, Robery, and Broyd, 2012; Winch, 1989).

The sector is becoming a significant driver of economic growth, globally, in this respect. In particular, residential buildings generate more work possibilities in low-income countries. Glossop (2008) observed that housing shortages are always creating opportunities for economic development through estate developers. Similarly, the housing and refurbishment sector in Australia contributed about $64 billion to the economy, representing 5.3 percent of the country's GDP(HIA Economic Groups, 2010; Iacoviello and Neri, 2010).

This opinion is in line with Wiley's (2012) study who also reported that the Philippine housing industry has made a positive contribution to the economy of the country,whereby it produces an extra $16.61 in GDP for each dollar $1 spent on residential operations. The sector in Nigeria in specific contributed to the nation's GDP, 2010-2012 after the rebasing of about 2.88 percent

according to the National Statistics Bureau (NBS) 2015 Report, whereas the industry accounted for about 2.13 percent in 2013.
These are largely achieved through ensuring adequate procurement processes by all public sector organisations in a country. Public procurement is the process whereby public sector organisations acquire goods, services and works from third parties (Pavel, 2009; Reimarova, 2011; Sarfo andMintah, 2013).

However, studies have shown that the Public Procurement Act (PPA) of 2007is capable of increasing costs of construction project procurement (Muhammad, AdamuandLadi, 2015). This could be attributed to the demands for bidding documents, stakeholders attitudes and other bureaucracies attached to construction projects which affect the cost of projects and participation of contracting firms (Rajeh, 2014; Hughes, 2016, Li, Arditi and Wang, 2013; Yahaya, Onukwube and Oyediran, 2019).

Therefore, these variables lead to high transaction costs and wastage of social resources in the economy, as a result draining the economy indirectly through such processes, consequently reducing the GDP at large. Several studies have recognized the presence and effect of such expenses on the contracting company.

This paper investigates the linkages between clients, contractor attitudes and project management efficiency in influencing transaction costs magnitudes for construction procurement in North-Western, Nigeria.

The objectives of this paper are: (1) to ascertain the effects of those factors (clients, contractors and project management) on the extent of transaction costs and (2) to determine the significance of such effects on the magnitude of transaction costs.

2. Literature Review

This section reviews the relevant theoretical framework for building project acquisition that can be used to analyse the variables under consideration. This research, however, has embraced transaction costs economic theory in order to obtain an adequate explanation of the transaction scenario in the procurement of building projects by contractors in Nigeria. Transaction costs theory is a bottom-up method compared to a study strategy that is mainly a top-down approach that has been used in building projects by many scientists.

In short, at any stage along with the theory–study–growth–practice cycle, the method of knowledge generation can start, while the flow along the cycle is multidirectional as shown in Figure 2.1. At any stage, the investigator or practitioner can begin and move in any direction. Thus, each domain of the cycle informs as well as is notified by each domain.

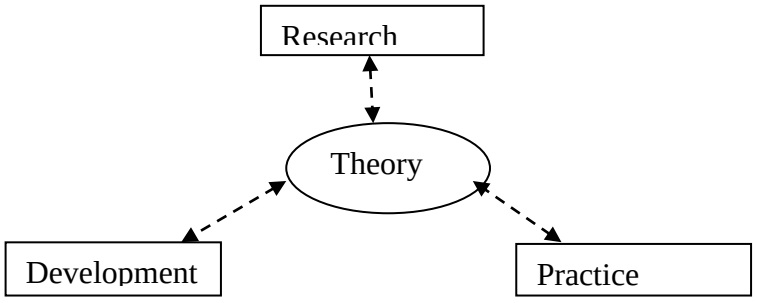

Figure 2.1: Theory – Research – Development – Practice Cycle.
Source: Swanson and Holton (2005) Cited by Ntiyakunze (2011) (pp 57)

2.1 Transaction Costs Economic Theory

John R. Commons launched the concept in 1931, that financial thinking was based on transactions. It is usually assumed, however, that Roland Coase originated the word "transaction price" when he used it to formulate a theoretical structure to determine whether the company and the market would perform particular financial duties. However, the word did not appear in his works until the 1970s. Although he is not the originator of the particular word, in his 1937 article, The Nature of the Firm, Coase discussed the "expenses of using the price mechanism," thus presenting the idea of transaction costs (Jacob, 2010).

He subsequently studied pricing processes and discovered that there are costs linked to searching, negotiating and contracting for appropriate rates(Coase, 1960, 1988, 1992).

However, Scitovsky (1966) launched the financial vocabulary with the label ' transaction price' (Hardt and Virno, 2006).

It is evident that the introduction of transaction cost economics into economics studies has long been in existence. It hadexisted as a scientific discipline for a very long time, but the account of the hypothesis of TCE began in the 1970s with Oliver Williamson.Theword "transaction cost economics" was first referenced in Williamson's (1979) article.

2.2 Client Attitudes

Many studies have identified different client behaviours that may have an impact on the bidding process in the construction project. Studies by Walker, (1995); Chan and Kumaraswamy (1997), Songer and Molenaar (1997), Dissanayaka and Kumaraswamy (1999), as cited by Li, Arditi, and Wang (2015) have pointed out that the behaviour of the owner is characteristic of the type and experience of the client, the knowledge of the construction team, the sophistication of the owner's construction, the well-defined scope, the risk aversion of the owner and the management of the client's projects. However,(Li, Arditi, and Wang, 2012) emphasized that the behaviour of the owner reduces uncertainty in the transaction environment and increases the efficiency of project management.

Consequently, the negative behaviour of the owner can lead to high impacts on the bidding process. The client's construction project behaviour, in terms of relationships with contractors, consultants, and co-workers, affects contractor bidding in terms of time, process efficiency and poor plans and specifications during and at the time of project implementation. A smooth relationship between the parties when bidding may enhance co-operation, reduce disagreements, facilitate conflict resolution and create stability in the behaviour of the owner, thereby reducing uncertainty in the transaction environment.

2.3 Contractors Attitudes

The ability of contractors to predict well the behaviours of their clients and competitors is lower than the transaction costs incurred (Li, Arditi, and Wang, 2014). Suspicions of unbalanced bidding, cheating, and collusion may lead to uncertainty in the bidding process, and consequently, lead to higher overall project costs for the owner (negative impacts), but it is difficult to detect imbalances(Arditi and Chotibhongs, 2009) and collusions, which can lead to contentious change orders (Manzo, 1997), all of which contribute to negative impacts. As indicated by the conduct of the owner, contractors who maintain a good working relationship with subcontractors may have a positive and strong influence on the performance of general contractors as opined byKale and Arditi (2001) cited in Li et.al, 2014) and may reduce the transaction costs of bidding.

Bresnen and Marshall (2000) argue that a good balance between contractors and owners enhances cooperation, trust, and stability in the conduct of the contractor, thereby reducing TCs. Li et al., (2014) and Lingard et al., (1998) identifies some of the elements or variables that

define the conduct of the contractor as: the conduct of the bidder, the qualifications of the contractor, the relationship with the subcontractors, the relationship with previous clients, experience in similar projects, material substitution and frequency claims (Chan and Kumaraswamy, 1997; Dissanayaka and Kumaraswamy, 1999).

2.4 Project Management Efficiency

The ability to provide maximum output given a set of inputs, or the ability to minimize input given a set of required output may depend on how efficient the project management team operates. Cooper (1993, 1994) cited by Li et.al (2012) consider the quality of project management as a factor that has a large impact on project productivity, quality, and rework. Li et al., (2012) states that efficient project management lowers transaction costs through good leadership, speedy decision making, efficient communication, fair conflict management, and high technical competency. Project managers must develop adequate leadership skills and use appropriate leadership styles during a project. These can only be achieved through a speedy decision-making process to ensure the best decision is made in the light of existing limitations, to strategically analyse conflict of a competitive nature and understand negotiation as a means of resolving conflicts. Technical competency in terms of knowledge and qualification is a catalyst for speedy decisions, smooth operations, few rework and easy communication, all of which reduce transaction costs impact when bidding by contractors (Carey, Subramaniam, and Ching, 2006). Effective and efficient communication as a variable or indicator of project management ensures that all team members are aware of decisions as soon as they are made, leaving no room for uncertainties in terms of individual responsibilities and goals, hence reducing transaction costs impact (Li et.al, 2013). It has been revealed that the efforts, resources, focus, determinations and time management within the project team influence a bidder's strategy to contribute in the future with a similar project or not (NoumbaandDinghem, 2007). Hence, it reduces transaction costs impacts.

2.5 Preliminary List of Factors

After a comprehensive and detailed literature review was conducted, the determinants of transaction costs are depicted in Table 5. The questionnaire was comprised of two sections. The first section consisted of the respondents' personal information, while section two consisted of the main part of the questionnaire. Section two was categorised into three groups in accordance with the nature of the determinants: clients' attitudes (CAs), contractors' behaviours (CBs) and project management efficiency (PME).

Table 1: The preliminary list of Determinant of transaction costs of construction procurement projects

Code	Determinants
	Clients Attitudes
VOB1	Relationship with other parties
VOB2	Experience in similar type projects
VOB3	Payment on time
VOB4	Organizational efficiency
VOB5	Change orders
	Contractors Attitudes
VCA1	Bidding behaviour
VCA2	Qualifications of the Contractor
VCA3	Relationship with subcontractor
VCA4	Relationships with previous clients
VCA5	Experience in similar type projects
VCA6	Material substitution
VCA7	Frequency of claims
VCA8	Location of bidding
	Project Management Efficiency
VPME1	Leadership
VPME2	Quality of decision making
VPME3	Quality of Communication
VPME4	Conflict Management
VPME5	Technical Competency
	Magnitude of Transaction Costs
VMTC1	Market research
VMTC2	Exploring financing opportunism
VMTC3	Conducting feasibility study
VMTC4	Dispute resolution
VMTC5	Contract Administration
VMTC6	Negotiation

2.6 Partial Least Squares-Structural Equation Modeling (PLS-SEM)

PLS-SEM is mostly used for theoretical development in exploratory research (Bamgbade, Kamaruddeen, Nawi, Yusoff, and Bin, 2018). Major SEM applications include path analysis, confirmatory factor analysis, second-order factor analysis, regression models, covariance structure models, and correlation structure models (Lin andJeng, 2017). In addition, SEM allows the analysis of the linear relationship between the latent constructs and the manifest variables. It also has the ability to create accessible parameter estimates for the relationships between unobserved variables. In general, SEM permits several relationships to be tested at once in a single model with various relationships instead of examining each relationship individually. The Smart-PLS has advantages over regression-based methods in the evaluation of several latent constructs with various manifest variables (Gefen, Straub, and Boudreau, 2000). PLS includes a two-step procedure as recommended by Henseler, Ringle, and Sinkovics (2009), which involves the evaluation of the outer measurement model and the evaluation of the inner structural model. Also, PLS-SEM is currently known and selected as the best method for multivariate analysis in social science studies (Hair, Ringle,andSarstedt, 2013).

2.7 Conceptual Framework

The conceptual model explicated the relationships between the latent variables and their related manifest variables. By using the SEM technique, a model was developed, and a total of 11 indicators reviewed from the literature were used as observed variables, they were categories into four constructs.

The constructs comprised of endogenous and exogenous latent constructs such as the client behaviour, contractor attitudes, and project management efficiency. Whereas, the endogenous latent variable (transaction costs magnitude) consisted of four observed variables.

The conceptual model presenting the relationship between the exogenous latent constructs and endogenous latent constructs is exhibited in Figure 2.2 Thus, transaction costs magnitude is influenced by the three major constructs, which are client, contractor and project management efficiency. The study hypotheses are as follows:

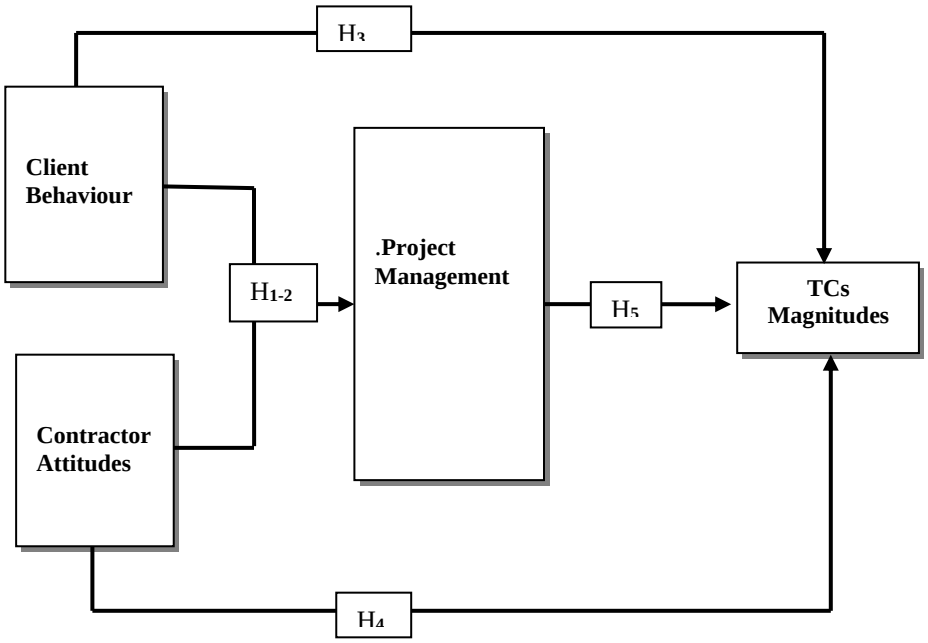

Figure 2.2 Conceptual framework of the study

H_1: Client behaviour has a significant effect on project management efficiency
H_2: Contractor attitudes have a significant effect on project management efficiency
H_3: Client behaviour has a significant effect on transaction costs magnitudes
H_4: Contractor attitudes have a significant effect on transaction costs magnitudes
H_5: Project management efficiency has a significant effect on transaction costs magnitudes

3. Research Method

Literature review was undertaken to identify the determinants of transaction costs for construction procurement, such as the behaviour of the contractor, the attitudes of the client and the efficiency of project management. A questionnaire was used to gather factual and perceptive responses and linkages between those determinants and the magnitude of transaction costs for construction procurement in Nigeria.

It has been argued that the questionnaire is a widely used approach for descriptive and analytical surveys to find out the facts, and opinions of respondents (Fellow and Liu, 1997; Naoum, 1998). Public procurement officers and contractors located in a part of the North-Western states of Nigeria (Kano, Kebbi and Kaduna) were the respondents to this research. This

study aims to find out the relationship between clients, the attitudes of contractors, project management and the magnitude of transaction costs in Nigerian construction procurement.
In order to determine the appropriate sample size for the study, a total population of 100 was sampled, taking into account the nature of the research and the tendency to reach all the population through the addresses and project sites of the respondents. Therefore, the confidence level of the sample was 95 percent, the acceptable margin error was 5 percent and the response distribution was assumed to be 100 percent.
This resulted in a sample size of 100 respondents. From the 100 questionnaires distributed, 94 questionnaires were returned, corresponding to 99 percent of the response rate. The study used structural equation modeling (PLS-SEM) techniques using SPSS and SmartPLS-SEM software to analyse the relationships of determinants variables within the conceptual framework.

4. Result

Partial least squares structural equation modelling (PLS-SEM) is a variance-based second generation multivariate statistical tool used in establishing a 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 is employed. In using PLS-SEM, two-stage evaluation criteria are hereby highlighted.

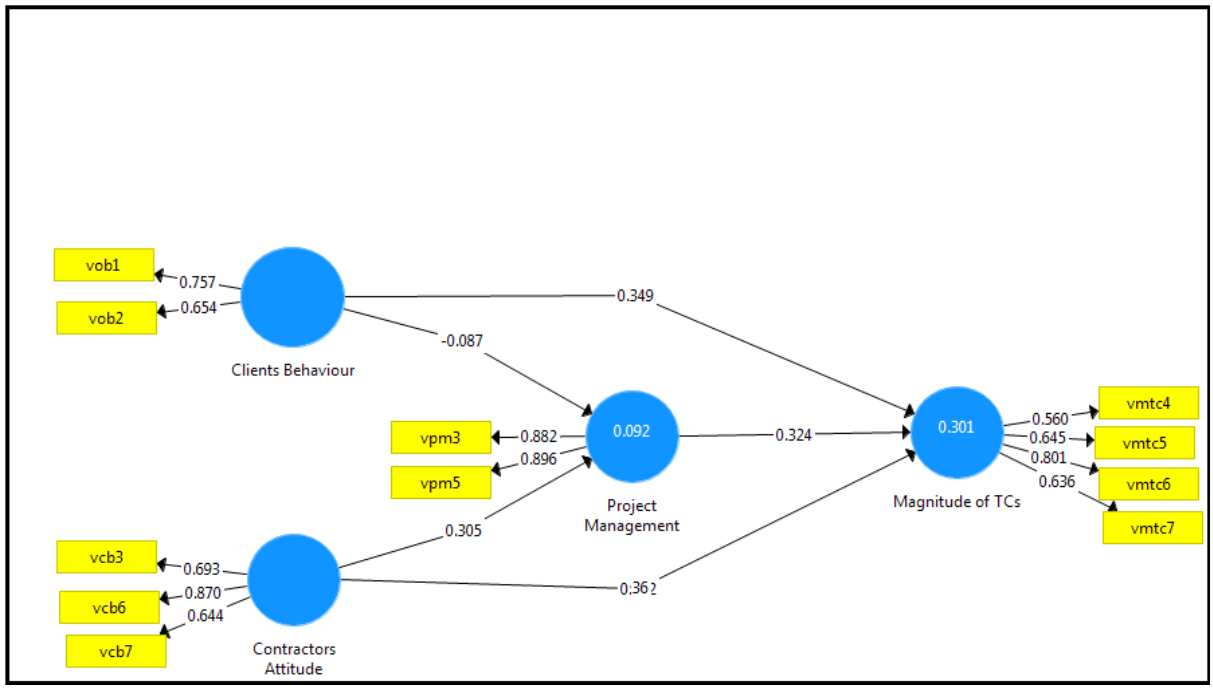

Figure 4.0 Hypotheses structural model of transaction costs determinant in construction procurement projects.

4.1 Measurement Model (Outer Model)

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, Sarstedt, Ringle, and Mena, 2011; Memon and Rahman, 2013; Wong, 2013).

Table 4.1: Summary of the Reflective Outer Model Result

Latent	Indicators	Loadings Indicator	Indicator Reliability (i.e. Loadindg^2)	Composite Reliability (CR)	AVE
Client Behaviour	VOB1	0.757	0.573	0.665	0.500
	VOB2	0.654	0.428		
Contractor Attitudes	VCB3	0.693	0.480	0.783	0.550
	VCB6	0.870	0.757		
	VCB7	0.644	0.415		
Project Management	VPM3	0.882	0.778	0.883	0.790
	VPM5	0.896	0.803		
Magnitude of TCs	VMTC4	0.560	0.314	0.759	**0.444**
	VMTC5	0.645	0.416		
	VMTC6	0.801	0.642		
	VMTC7	0.636	0.404		

Indicator Loadings: Observed variables with an outer load of 0.7 or greater are considered to be highly acceptable while the outer load should be discarded once with a value that is of less than 0.7 (Hair, Sarstedt, Matthews, and Ringle, 2016). Nevertheless, the cut-off value accepted for the outer loading was 0.500 for this research. The outer loads ranged from 0.560 to 0.882 from Table 4.1 and Figure 4.0. This shows that more than 50 percent of the variance of the indicator is explained by the construct, thus giving acceptable item reliability. Similarly, the reliability of the indicator is greater than the minimum acceptable range of 0f 0.4, except for VMTC3.

Internal consistency reliability: Table 4.1 demonstrates that for all constructs the composite reliability (CR) was higher than 0.70, except for client behaviour which indicates lower reliability among the construct, this could be attributed due to two indicators with minimum loading as shown in Figure 4.0 and Table 4.1. The CR showed that the scales were reasonably reliable and indicated that the minimum threshold level of 0.70 was exceeded by three latent construct values. This demonstrates that the indicators are appropriate for construction procurement transaction costs exploratory research.

Convergent Validity (AVE): The Average Variance Extracted (AVE) of each latent construct was calculated by squaring the mean of indicators for that construct to confirm the convergent validity of the factors. Table 4.1 shows that all AVE values were more than 0.5, so for this research model convergent validity was confirmed. The findings confirmed that the structure explains at least 50% of the variance of its goods**.**

Discriminant Validity: The next stage was the latent constructs ' discriminating validity. Discriminant validity defines that in any construct the manifest variable is distinct from other constructs in the path model, where its cross-load value in the latent variable is greater than in any other construct (Rönkkö, McIntosh, and Antonakis, 2015). The criterion and cross-loadings of Fornell and Larcker (1981) were used to assess the discriminating validity (Aguirre-Urreta, Rönkkö, and Marakas, 2016).

The standard proposed is that a construct should not display the same variance as any other construct that exceeds its AVE value (Aguirre *et al*., 2016). Table 3 shows the model's Fornell and Larcker criterion test where the squared correlations were compared to the correlations of other latent constructs. Table 3 demonstrates that all correlations were lower relative to the average square root variance exerted along the diagonals, suggesting adequate discriminating

validity. This showed that in each structure the observed factors indicated the specified latent variable thus confirming the model's discriminating validity.

Table 4.2: Fornell-Larcker Criterion Analysis for Checking Discriminant Validity

	CA	CB	MTC	PM
CA	**0.742**			
CB	0.170	**0.707**		
MTC	0.326	0.367	**0.666**	
PM	0.290	-0.035	0.362	**0.889**

As a result, the suggested conceptual model will be acceptable, with confirmation of adequate reliability, convergent validity, and discriminant validity and the verification of the research model.

4.2 Structural Model (Inner Model)

Having confirmed the validity and reliability of the measurement model, the next stage is to assess the results of the inner structural model. This included observing the predictive relevance of the model and the relationships between the constructs. The determination coefficient (R^2), the path coefficient (β -value) and the T-statistic value, the effect size (f^2), the model's predictive significance (Q^2), and the goodness-of-fit (GOF) index are the main norms for the internal structural model evaluation.

Coefficient of determination (R^2): The coefficient of determination measures the overall effect size and variance explained in the endogenous construct for the structural model and is thus a measure of the model's predictive accuracy. In the current study, the inner path model was 0.301 (figure 1) for the magnitude of transaction costs explain 30.10% of the variance in the transaction costs magnitude, meaning that about 30.10% of the change in the transaction costs magnitude was due to three latent constructs in the model (Client behaviour, contractors attitudes, and project management efficiency). According to Henseler, Hubona, and Ray (2016) an R^2 value of <0.350 is considered large, an R^2 value of 0.15-0.350 is regarded as moderate, and an R^2 value in this study was 0.301 and is moderate. Similarly, client and contractors' attitude together explain 0.092 of variance in project management efficiency (PM), thus indicating a weak determination.

Measuring the effect size (f^2): The f^2 is the degree of the impact of each exogenous latent construct on the endogenous latent construct. When an independent construct is deleted from the path model, it changes the value of the coefficient of determination (R^2) and defines whether the removed latent exogenous construct has a significant influence on the value of the latent endogenous construct. The f values were 0.35 (strong effect), 0.15 (moderate effect), and 0.02 (weak effect). The effect size for client behaviour, contractor attitudes and project management efficiency on transaction costs magnitude were 0.168, 0.038, and 0.136, respectively.
Hence, the values were (moderate and weak). According to Cohen's recommendation, the f of all three exogenous latent constructs on transaction costs magnitudes had a moderate and weak effect on the value of R^2.Furthermore, one independent latent construct in this study participated relatively to the averagely R^2 value (30.10%) in the dependent variable.
Path coefficient β- value and T-Statistic value: The path coefficients in the PLS and the standardized βcoefficient in the regression analysis were similar. Through the βvalue, the significance of the hypothesis was tested. The βdenoted the expected variation in the dependent construct for a unit variation in the independent construct(s). The βvalues of every path in the hypothesized model were computed, the greater the βvalues, the more the substantial effect on

the endogenous latent construct. However, the βvalue had to be verified for its significance level through the T-statistics test. The bootstrapping procedure was used to evaluate the significance of the hypothesis. To test the significance of the path coefficient and T-statistics values, a bootstrapping procedure using 5000 subsamples with no significant changes was carried out for this study as explained shown in Table 4.3.

Table 4.3: T-Statistics of Path Coefficients (Inner model)

Path	Standardize coefficients	T-Statistic	p-value	Hypothesis
PM →MTC	0.324	**1.990**	**0.022**	**Supported**
CA→ PM	0.304	**2.265**	**0.024**	**Supported**
CA→ MTC	0.362	**2.178**	**0.001**	**Supported**
CB→PM	-0.087	0.443	0.658	Rejected
CB→MTC	0.349	**2.497**	**0.013**	**Supported**

In H_1, we anticipated that client behaviour would influence project management efficiency significantly and positively. The findings in Table 4 and Figure 1 disconfirmed that client behaviour had no significant impact on project management efficiency in construction procurement (β= -0.087, T= 0.443, p > 0.658). H_1 has therefore been robustly rejected. In addition, when observing the direct and positive influence of contractors' attitudes on project management efficiency (H_2), the findings from Table 4.3 and Figure 4.0 confirmed that contractors' attitudes strongly influenced project management efficiency (β= 0.304, T= 2.265, p < 0.024). The influence of client behaviour on the magnitude of transaction costs (H_3) was beneficial and significant (β= 0.349, T= 2.497, p<0.013). The impact of contractors' attitudes on magnitudes of transaction costs (β= 0.362, T= 0.978, p > 0.0329) was beneficial and significant, thus promoting H_4. Similarly, the findings in Table 4.3 given empirical assistance for H_5, where the influence of project management efficiency on magnitudes of transaction costs was positive and significantly impacted (β= 0.324, T= 1.990, p < 0.022), confirming the hypothesis (H_5). The higher the beta coefficient, the higher the impact of a latent exogenous construct on the latent endogenous construct. Table 4.3 and Figure 4.0, therefore, showed that, when compared to other β values in the model, contractors' attitudes had the highest route coefficient of β= 0.362, which indicated that it had a higher variance value and a strong impact on the magnitudes of transaction costs of construction procurement projects. The client's behaviour had the least impact on the project management efficiency of the project with β= -0.087.

Discussion of Findings

The perceived role of construction procurement stakeholders in ensuring minimum transaction costs for construction procurement projects reveals that the bulk of the responsibility lies with the client, contractors and project management consultants. Their roles or responsibilities are interdependent in such a way that each of them needs to cooperate with the other in order to achieve their objectives. From the client to the contractor, from the contractors to the construction contract management project to the subcontractors, all parties must work together to meet the minimum transaction costs. The findings of this study show that an ethical attitude towards the procurement process among stakeholders minimizes exchange costs during the post and pre-trial period. The identified ethical attitude of clients and the contractors show significant improvements. These improvements focus mainly on areas like good relations with other parties, experience in the type of project, less frequency of claims and material substitution by contractors, which indicates higher factor loadings and coefficient from the structural path analysed.

Client behaviour is discovered in order to maintain a good relationship with other parties and to gain more experience in a similar type of project in this study. They are excellent indicators of good behaviour (CB) with loads of 0.757 and 0.654 respectively. Construction stakeholders should not ignore these fundamental aspects of day-to-day interaction, as clients'behaviour havebeen shown to have a significant impact on the magnitude of transaction costs incurred in construction procurement. Consequently, the need for negotiation and standard contract administration (Li Arditiand wang., 2015; Arditi, Pulket 2010) is likely to reduce transaction costs mainly in terms of legal fees and miscellaneous costs by given much attention during the planning stage of the procurement.

In the meantime, it has also been disclosed that communication quality and technical competence are significant project management efficiency (PM) indicators (Li et al., 2015) with loads of 0.882 and 0.896, respectively. Technical competence concerns the extent of the technical know-how available in the company, that is necessary for the implementation of specific projects and the number and type of equipment owned by the company, that are necessary for the physical implementation of construction projects (Isik, Arditi, DilmenandBirgonul, 2010). According to Warszawski (1996), the technical competence of a company can be assessed by analysing the company's preferred construction methods, the experience of its technical staff, the productivity and speed of its construction activities and the quality of its output. The existence of technical competence, i.e. appropriate qualifications and experience, is conducive to rapid decision-making, smooth operation, limited rework, and easy communication, all of which contribute to lower transaction costs (Carey, Subramaniam and Ching, 2006). The technical competence of the project team can be assessed by following the guidelines that are routinely used in the qualification process and are an integral part of the bidding process.

Transaction costs are expected to be higher if project management efficiency is low (Li et al 2013 and 2014), i.e. if project team leadership is lacking, decision-making is slow and inefficient, communications are poor, there are no routines for efficient conflict management and there is a lack of technical competence in the project team. The different performance of the project management team in different indicators may affect transaction costs accordingly. One should strive for excellent performance in all indicators of lower transaction costs.

Internal model assessment shows that client behaviour (CB), contractor attitude (CA) and project management efficiency (PM) together can only explain the magnitude of transaction cost (MTC) variance by 30.1%. This is a significant finding because it indicates that other factors should be considered in future studies by researchers in the context of the exploration of transaction costs in construction procurement.

Conclusion

From the findings above, the study concludes that as far as owners' role in the construction project procurement to be less costly, the owners' relationships with other parties and the owners' experience in similar type projects positively affect transaction costs magnitude as evidently appeared and supported in literature. As far as the contractors' attitude in the transaction is concerned, the literature indicates that the following factors may be of importance: relationships with subcontractors, material substitutions, and claim strategy. Meanwhile, project management-related factors that affect transaction costs are generally believed to be communication and technical competency. Thus, future research endeavour should be directed towards similar studies conducted to confirm or refute the significance of those determinants as they influence transaction costs in construction procurement in other geopolitical zones of the county.

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