Magnitude of Transaction Costs on Contractors for Eligibility Documents, Contract Administration and Bidding

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Abstract

The research assessed the magnitude of transaction costs incurred by contractors with respect to eligibility papers, contract administration and process costs of bidding expenditures. Multi-stage stratified random sampling method was used to select participants from building companies from two hundred and thirty (230) contractors in chosen North-West states registered in the contractors ' database of the Bureau of Public Procurement, who are deemed to engage in any federal tendering process as participants. Different participants submitted two hundred (200) questionnaires. Modelling of structural equations has been used to evaluate the information from the participants. Results show an important connection existed between the eligibility documents, the process of bidding expenditures, contract administration costs, and the models of procurement guides (PPA 2007). This shows that, when bidding projects, the Transaction Costs (TCs) incurred by contracting companies are between 5-10% of the contract amount. The study proposes that the federal government procurement regulatory body should amend the present PPA 2007 Act in Nigeria. MDAs that are in line with the PPA rules should ask for minimum requirements or criteria.

Keywords: *Procurement Act 2007, Eligibility document, Contract, Infrastructure, and Transaction costs theory.*

Introduction

A critical look at current literature, few studies, primarily in Europe, Asia and some parts of Africa, tried to assess or determine transaction costs in building projects. Some of these research included Public Private Partnership (PPP) and Client / Ownership Construction contracts. The surveys only report the total price of the transaction (Soliño & Gago de Santos, 2009). In order to estimate the transaction cost of PPP projects, (Farajian, 2010) develops a Byesian network based model.

Similarly, Rajeh (2014) created a model based on (SEM) to estimate Newzealand's traditional procurement and construction-design transaction. Sam (2014) examines those factors that affect the tendering costs incurred by contractors in Ghana when applying the Act (663, 2003). There appears to be a lack of empirical research in building projects using the PPA (2007) to determine transaction costs incurred by both customers and contractors.

Clients and contractors are unaware of the cost consequences of the pre-and post-procurement process and its effect on the project's effective delivery.

Tender papers are only ready in the belief that contractors are going to buy, submit and concentrate on winning. But, the time that experts spent preparing such a document, searching for data, advertising, negotiation, and implementation after award was not provided much attention. Similarly, contractors or bidders do not consider the costs incurred in obtaining these compulsory documents as requested by the clients during the opening of tenders, packaging, registration with the organization, transport and accommodation. These are seen as contributing factors to the amount of funds spent on a project that any stakeholders in the construction industry need to know about.

Therefore, in a specified transaction, how can such costs be quantified, evaluated or determined? Rajeh (2014) attempts systems in his research. His research regarded only a few transaction sources to determine the magnitude of those costs incurred for both traditional and design-build costs in building and in a specified place during the pre-and post-contract period. Geyskens, Steenkamp, and Kumar (2006) indicated that the use of transaction cost theory requires in-depth research of transaction costs across the different disciplines. These will synthesize empirical research quantitatively across a broad range of disciplines and studies.

Building on the above-mentioned gap transaction cost, however, is not exceptional in having such costs incurred by both Client and Contractors or Consultant during their contracting process. This leads to the decision to directly or sub-contract part of the production process to other firms (indirectly) using production factors. Different authors have attempted to describe / explain contracting in the construction industry, which usually depends on work organization transactions using the economic transaction cost framework (Casson, 1994; Reve, 1990; Reve & Levitt, 1984; Winch, 1989);

There have appeared many empirical researches that support the notion of transaction costs (Dutta & John, 1995; Lyons & Parish, 1994). However, some scientists asserted that it was not possible to analyze the construction industry using traditional transaction cost theory to explain it (Dietrich, Reiss, Hsu, & Montgomery, 1995). It therefore ignores the inherently vibrant nature of issues related to contracting and organization (Dietrich *et.al.,* 1995). In his perspective, however, such costs can be described as management expenses connected with contract forming and implementing and presented as a means of comparing manufacturing expenses. Through this strategy, transaction and organizational costs can be understood as leadership expenses, whether in-house or not. Li, Arditi, and Wang (2014) asserted that the cost of manufacturing is the cost of transforming input into output, while the price of transaction is the result of financial exchange.

There argument demonstrates that transaction costs can vary depending on the structure of governance or market type of such transaction. In short, transaction costs occur in any type of relational conduct that happens when products or services are transmitted across an interface that is technologically separate. These may be called cost of transaction or cost of leadership that is not component of cost of manufacturing.

If it is agreed that transaction costs occur when conducting a transaction between organizations, people or companies, how should such costs be determined in a science manner by implementing the appropriate theory to justify it as mentioned previously in the start? Such transaction cost sources can be traced back to prior research to bear witness to their presence. Cited by(Hughes, Hillebrandt, Greenwood, & Kwawu, 2006; Lingard, Hughes, & Chinyio, 1998) argues

that this must include ex-ante and ex-post costs.

The ex-ante costs are the costs of tendering, negotiating and writing the agreement, whereas the ex-post costs include the costs of executing and policing contracts or resolving conflicts resulting from the contract job. Ive and Gruneberg (2000) cited expenses such as search expenses, costs of selecting suppliers, costs of tracking efficiency and costs of enforcing contracts. Hughes et al. (2006) categories that cost pre-tendering, tendering, and post-tendering.

Contractors in the construction industry now perform nearly 80-90 percent of building works (Kadan, 2017). The Client transacts with the Contractor on the basis of predetermined parameters such as layout, price, time and quality. Most of the two sides also have a healthy connection to attain their goals.

The research is essential in that it gives the magnitude of transaction costs incurred on eligibility criteria, bid papers and contract administration in Nigeria for open competitive bidding. It also adds to the literature on transaction costs in estimating traditional procurement TCs on contractors ' bidding. In addition, economic and technological systems in the construction industry will be enhanced by raising the contracting firms ' retained operating costs and increasing the likelihood of winning agreements by contracting companies in Nigeria.

Thus, this study's main research issues are:

1. What is the magnitude of the expenses incurred in obtaining eligibility papers by contracting companies?
2. What is the magnitude of costs incurred by contracting companies in the process of bidding?
3. What is the magnitude of expenses incurred in project management by contracting companies?
4. Does the tendering of building projects under the PPA 2007 have any connection between eligibility papers, the tendering process of expenditures and contract administration costs?

Literature Review

Transaction Cost Economics Theory (TCT)

The theory of transaction cost economics has become a predominant theoretical framework (model) for explaining choice on organizational boundaries. The transaction

cost theory was not fully created at the beginning, like most important theories. In reaction to fresh theoretical and empirical growth, it has been and continues to be maintained and reformulated, corrected and expanded(Geyskens et al., 2006).

The concept of transaction costs originates from Coase (1937), in his article "The nature of the company" in which he explained market and hierarchies as alternative systems of governance. The market is considered to be the dominant model of financial organization logic in both production, design and overall (Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009). Classical economic theory views the market as an economic system "working itself" with demand-adjusted supply and consumption-adjusted manufacturing (Coase, 1937). According to Coase (1937), there are companies because the price of arranging a transaction within the company is smaller than that associated with organizing it through open market exchange. In other words, there are certain costs connected with running the market, and in order to decrease these expenses, it is essential to sign an organization (Coase, 1937).

During such transaction, these related expenses are incurred, which are not manufacturing costs. They are regarded as the determining variables in such a scenario or condition as to whether a company manufactures the item in-house or purchases from the outside market. They emerge from ownership or property rights transfer (Hughes et al., 2006). The only alternative is to envisage a Robinson Crusoe economy; where there are no other parties engaged, there is no notion of ownership or property rights, and there is no need or chance. Therefore, in this situation, all expenses are manufacturing expenses to create contracts.

There are transaction costs when financial organization exists, which means they are universal in practice. It includes the price of:

a. Drawing up contracts and contracts;
b. Definition and inspection of transactions involving products;
c. Records holding
d. Preparing documents for bidding;
e. Implementation of contracts and contract.

Items (a) and (b) above are very high in the construction industry due to the complexity of the production method of a building or other works. The customer buys a product that he can't see in advance because it's

custom-made and doesn't exist when he agrees to buy it. It is complicated to find the correct contractor to generate the plant and agree on a cost and involves binding contractual arrangements to implement the contract made (Hughes *et al.,* 2006).

Therefore, the assessment of the building works ' transaction costs based on transaction cost theory is important. Because of the significance and wider implementation of the theory to the branch of economics, finance and management regarding the choice to use production factors directly or to subcontract is component of the manufacturing process for other companies. This shows the transaction cost appearance in both instances. Transaction costs are incurred in the first scenario owing to recruitment of employees. While transaction costs are incurred in the second scenario as a result of locating the suitable subcontractors, obtaining rates, either through tendering or negotiation and contract arrangements. So, it relies on the comparative expenses of the two techniques to decide which technique to use.

In short, the theory of transaction costs (TCE) aims to compare and contrast the different ways in which transaction can take place in the accessible sector but at a minimum price during such exchange of products. Thus, the research tries to assess such costs incurred by Client / Contractor at the tendering life cycle through the use of the requirement of PPA (2007). This will determine the cost effectiveness of the Act as part of its primary goals in terms of economy, efficiency and fairness by implementing the theory (TCE).

Procurement Options

As we have already mentioned, the customer has several procurement alternatives available and there are several variations within each choice, each of which could be refined to suit specific customer requirements and project requirements. For example, it is normal to have some of the works performed under a cost plus or re-measurement arrangement within a traditional arrangement, and also to allow a portion of the works to be designed and constructed on a basis. In creating a sound procurement approach, an appreciation of the operation and implementation of each procurement option is crucial (Ashworth, Hogg, & Higgs, 2013).

The procurement delivery method is, according to Lædre, Austeng, Haugen, and Klakegg (2006), the main factor in determining whether a project would

succeed or fail as mentioned in Mathonsi and Thwala (2012). Over the years, the construction industry has experienced a great deal of transformation (enhanced project size and complexity, enhanced economic limitations, political and social changes, changes in information technology among others) resulting in the creation of other solutions to the traditional design-bid-build scheme. (Royal British Architects Institute, (RIBA, 2000; Mathonsi & Thwala, 2012). The Design-build, Construction Management, Construction Management at Risk, and Integrated Project Delivery among others are popular among the techniques that have appeared. However, two of the methods, the traditional (design-bid-build) and the design-build, will be considered for the purpose of this study.

Traditional Method (design-bid-build)

n this strategy, the customer commissions an architect to take a brief, generate designs and build data, invite tenders and manage the project during the building period, and settle the final account. If the construction proprietor is not tiny, the Architect will traditionally advise the client to appoint advisors such as Quantity Surveyors, Structural Engineers and Building Services Engineers as the first point of customer contact. Other advisors, especially the surveyors of quantities, may also be the first port of call of the client. The contractor, who is not responsible for design, will usually, be chosen by competitive tender unless there are excellent grounds for negotiation.

Similarly, according to Dadzie, Winston, and Hinson (2015) is the scheme in which the customer first appoints advisors (architects or technicians) to design the project after which he invites contractors to tender for the building of the already constructed project (generally on a competitive basis). Stauffer (2006) found that the proprietor usually maintains enhanced project control. It should also be observed that here the proprietor creates immediate relationships with two separate and autonomous parties, hence the design consultant and the construction contractor.

The fact that at the beginning of the project the design is more accurate and comprehensive and that the proprietor can choose and standing reputation architect or engineer adds benefits to this technique. However, a greater general price and a longer timetable are more probable to occur as each party would try to represent its own interest. In addition, the probability of disputes is present. Since the architect

would have no control over the construction of the project he designed, and since the contractor would have to construct a project in which he had no input, it would be difficult to determine who would be held responsible if something were going wrong (Stauffer, 2006). Some of the merits of this alternative is that, as cost is known before building begins, there is a high level of price certainty for the client. A high degree of price certainty occurs unless the design process is fully finished in the pre-contract phase.

Design and Build

The design-build technique is a wide word that describes a procurement path in which a customer appoints only one principal contractor who is liable for carrying out the project; both design and construction. The design-build is not a recent concept, but one that has been in the world for over 4000 years; in the old concept of a master builder who took full responsibility for everything involved in the construction of a building; from the design stage to the actual completion and transfer (Tyler & Blader, 2003). The design-build scheme is emerging again as a cost-effective alternative to the traditional technique of building that has dominated the construction industry over the previous 200 years (Tyler & Blader, 2003).

According to Tyler and Blader (2003), one liability involves the advantages of the design-build scheme; early company cost understanding, value engineering, time strategies, and performance improvement. Brook (2008) also said that design-building technologies benefit from rapid project delivery since the design and construction stages have been incorporated, although unfinished paperwork that is a source of uncertainty can occur quite often, making it hard to predict and estimate costs.

Design and construction will have benefits if issues occur during the works, the contractor will not be able to blame the consultants of the client and will be encouraged to reduce design issues and mitigate them when they occur. Its demerit involves: decreased design control capability for customers, difficulty in comparing tenders, and dedication to complete design. The surveyor of the client is accessible with a much lower level of price data and important cost leadership issues (Ashworth et al., 2013).

Selective/Restrictive

Selective tendering was described by the Chartered Building Institute (2009) as a *technique for choosing tenderers and acquiring tenders whereby a restricted*

number of contractors are invited to tender. The tender list consists of contractors deemed appropriate and capable of carrying out the job. Usually, pre-selection processes determine this suitability.

Selective tendering includes choosing several tenderers and requesting them to tender for the works. It therefore tends to function by invitation but it implies that a predetermined method would have screened those chosen. The selected companies are generally selected for their capacities and each one is able to deliver the project in theory. The agreement can therefore be granted on the grounds of the smallest price / offer. This strategy remains responsible to the government industry as it involves competition (Kwakye, 1994). Selective tendering is much more reliable since only a few chosen tenderers are invited to tender, allowing the customer to select the smallest tender without being dangerous (Smith, Merna, & Jobling, 2006). Also the customer is likely to get the greatest value for cash.

A weakness of a client's selective tender is that some bidders may still use cover pricing to reduce the quantity of severe offers (Ofori, 1990). Cover pricing can be overcome by the preliminary investigation; where prospective bidders are asked to indicate whether they would be interested in bidding before they receive an invitation. That should operate fine in theory, but in reality, it is often hard for some contractors to decline an invitation. Such contractors would discover it simpler to submit a cover price than to decline an invitation because they might believe saying no now would deny them a future chance with the customer. However, if customers can show that contractors are not being penalized for refusing to bid, then all real offers can be obtained from contractors.

The Act enables a very limited use of restricted tendering. Only upon authorization by the Public Procurement Authority can an organization use this technique. Therefore, the Act sets out the circumstances under which this procurement technique can be used. The technique can be used for economic and effectiveness purposes.

The terms they may be used under may include:

a. If a restricted amount of companies
b. provide the goods / services / works. If the time and cost required examining and evaluating a large number of tenders compared to the value of the goods / works / services is irrational.

Bidding costs

According to Brozowaki (2001), significant companies of machinery have calculated that it costs them up to $75,000 (US$ 75,000) to bid on a complicated tender. Although indirectly, these expenses are eventually passed on to the client. Project engineers and tender executives are usually extremely paid, qualified individuals who end up spending much of their time managing the tender process by doing secretarial and administrative job rather than adding importance to it.

The activities engaged in the spending of the tender warrant. Every organization is going to spend on a project tender. The side of the client will also spend initiating and running a tendering process. Once competition is used, the cost of abortive tendering becomes important; for organizations that fail to win the project, tendering costs will either have to bear or find a way to recover. The more a bidding exercise involves building companies, the greater the abortive cost. Tendering costs are generally subsumed in the overhead of a company(Chinyio, 2011).

Sources of bidding costs Under PPA 2007

Bidding is a process that provides a transparent, fair and value-for-money selection process based on established criteria. It is most important in organizations that are subject to a degree of stakeholder public scrutiny. In the case of government departments, these stakeholders could be the general public or shareholders in the case of companies. There are advantages to the tendering process, in fact, but costs also exist. More to the point, if these costs are not effectively managed then they can be quite significant and not yield proportionate returns (Dalrymple, Boxer, & Staples, 2006; Laryea, 2008).

Bidding or tendering expenses happen in any tendering phase during three to four stages ((Dalrymple et al., 2006; Laryea, 2008; Rajeh, 2014) . These are:

Preparation of tender papers by contractors.
Preparation of tender reaction by potential contractors (eligibility documents).
Assessment of tender submitted and choice of contractors.
Pre-and post-contract administration.

Preparation of bids documents

This phase includes putting together the different documentary criteria and the estimate for obtaining the final submission

tender. This may include multiple operations, including market survey to acquire material prices, search for material utility rates, plant production rates, and human labor among others. At this point, additional site visits may be regarded and visits to the Income Tax Office (FIRS), the PENCOM office, the NSITF office, etc. may be created to purchase the appropriate statutory records. Bankers can also be approached to provide records such as bid safety, loan lines, bank statements, etc. while the building firm's account section can provide the audited account. Other conditions regarding the ability of the company may also be assessed and the present document ready with the tender for submission.

Preparation of mandatory/eligibility documents

Zielczynski (2007) described a necessity that is "a situation or ability to which a project, product, service or system conforms the most." Thus, throughout the building period, cost, time and power will be saved. Construction project specifications include; absence of evaluation and feedback to customer brief; requirements for customer change and layout commonly; needs of unclear end-users etc. (Yu & Shen, 2013). Yu and Shen (2013) proposes that an experienced project participant should be appointed as the client requirement manager to decrease or mitigate the requirement issue in the building project. In addition, a formal procedure must be established for recording, managing and tracking modifications in the client requirement.

Mandatory conditions include not only Tax, Pencom, ITF, NISTF and IRR, but also extra evidence to prove the customer's ability to carry out the building project technically and financially (PPA, 2007) to build customer and other company confidence. Zielczynski (2007); Li *et al*., (2012 and 2013) summarized numerous bidding success studies and research, identifying some elements including the requirements of customers, the conduct of contractors, the transaction environment, access to data, effectiveness of project management and transaction magnitude.

The 2007 Public Procurement Act recognized about ten (10) main elements in the bidding of building projects: tax clearance, pension certificate, industrial training certificate, domestic social insurance, economic capacity, equipment ownership, court affidavidit, bank guarantee performance bond, advance

payment guarantee and BPP interim registration report.

Mandatory requirement documents (MRD) is evaluated in this research as tax clearance, certificate of pension, certificate of industrial training, domestic social insurance, economic capacity, possession of machinery, court affidavidit.

Research Method

This research was performed in some chosen NW state comprising Kaduna, Kano and Sokoto. The states are three of the region's seven (7) states, and their population is estimated to be about 10.5 to 12 million. The population consisted of contractors within the selected North-West geographical zone states of Nigeria (i.e. Sokoto, Kano and Kaduna) registered with the Contractors Database of the Civil or Building Categorization / Classification Bureau indicating their IRR number or ID, (230 Companies).

In the selection of participants from building companies in this research, a multi-stage stratified random sampling method was used. Construction firms of respondents were purposefully selected on the basis of their Civil or Building Categorization / Classification Contractor Database registered with the Bureau of Public Procurement indicating their IRR (Interim Registration Report) number or ID. The research used Structural Equation Modeling (SEM) methods to evaluate data collected. Items loaded under 0.40 have been omitted. For all constructs, the Cronbach's Alpha coefficients are above 0.7 and the corrected items-total correlations are above 0.32, so all measuring items have been maintained and placed into the final questionnaire to gather the data.

Results and Findings

Principal Component analysis (PCA)

PCA was applied to determine factor structures. To ensure a satisfactory EFA for the data, some standards must be met. First, the KMO (Kaiser-Meyer-Olkin) coefficient must be = 0.5 and the significance of the Bartlett's test must be < 0.05 (Williams, Onsman, & Brown, 2010). Second, to ensure practical significance of the factor analysis, factor loading must be > 0.4 (Ugulu, 2013). Third, total variance must be >= 50%, and all factors must be extracted at eigenvalue cut-off > 1.0

For EDC, KMO = 0.677 and the Chi-square of Bartlett's test = 289.753 with a significance of 0.000 (<0.05), indicating that the correlation matrix is not an identity

matrix. Four elements were extracted and the eigenvalue cut-off of the fouth factor is 1.105 (>1.0); the total variance is 58.104% (> 50%). Thus, factor analysis standards are satisfied and the result is significant. The four factors includes, D33, D44, D55 and, D77.

Similarly, other factors were also determined using SPSS to analyze PCA. The results show that all remaining factors (BEP, and CAC,) had KMO coefficient > 0.5, and significance of Bartlett's test < 0.05; all the factor loadings are > 0.7; eigenvalues are all >1.0, and account for more than 50% of the variance.

Table 1: PCA for constructs

Constructs	Items	Factor Loading	Kaiser Meyer-Olkin (KMO)	Barletts Test of Sphericity	Total Variance Explained
Eligibility Documents	D33	.911	.677	289.753	51.418
	D44	.787			
	D55	.797			
	D77	.662			
Bidding Cost	BC1	.734	.643	55.001	62.056
	BC2	.840			
	BC3	.786			
Contract Admin	CA5	.579	.661	180.459	35.866
	CA8	.684			
	CA9	.739			
	CA10	.746			

Reliability and Validity Tes

The validity and reliability of a quantitative research investigation are vital characteristics (Li, Arditi, & Wang, 2012). The scales of the products used to evaluate each structure are screened for reliability before data analysis using SEM and to verify internal consistency of the constructs (J. Hair, Money, Samouel, & Page, 2007). Researchers (Amaratunga, Baldry, Sarshar, & Newton, 2002; Saunders, 2011) stated that reliability is essential for the consistency of study results provided by the methods used to collect information. The

alpha values of Cronbach (Table 2) were evaluated using SPSS 20 to determine the constructs ' intercorrelation and reliability. The experiment by Cronbach shows how well a set of observed variables measures a single one-dimensional latent structure (Anderson & Gerbing, 1988). For a set of observed items, an alpha coefficient of $\alpha > 0.7$ from Cronbach is regarded acceptable reliability(De Vaus, 2002).

Table 2.0 indicates that all Cronbach's calculated alpha coefficients are above the $\alpha > 0.7$ limit point, suggesting that the set of observed factors are excellent measurements of a single one-dimensional latent structure (Anderson & Gerbing, 1988). For excellent model fit, all loading variables (Fig.2) of the measuring products should be above 0.5. The measurement and structural model are assessed using confirmatory factor analysis after constructs have been tested for reliability and validity. Evaluation of the model including examines: the identification of the model, the comparative importance of Chi-square, and the indices of fitness.

Table 2 Construct Reliability and Validity Statistics

Construct	Item Cronbach's Alpha	Construct Cronbach's Alpha
D33	..700	
D44	.788	..833
D55	.801	
D77	.850	
BC1	.670	.700
BC2	.501	
BC3	.608	
CA5	.678	
CA8	.661	.735
CA9	.701	
CA10	.734	

Model development: bidding model

Amos 21 was used to create relationship patterns among the constructs. The structural models were recursive (repeated or associated variables relationships), meaning that all paths went from a predictor structure to the resulting structure. In the meantime, a non-recursive connection between any two constructs means that their connection is causal and influences one another. As mentioned by (Hair, Sarstedt, Ringle, & Mena, 2012) with cross-sectional data, the scenario of a causal relationship is unlikely. The resulting results from conducting SEM using Amos 21 were stated on a route diagram showing the interactions between variables through the main regression equations solved for different parameters.

Finally, through first-order variables (direct relationship) the costs of eligibility papers, bidding and contract administration were hypothesized in this research. Transaction costs were hypothesized through a second-order framework, and the effect of procurement guides through a second-order framework was also hypothesized. The hypothesized relationships were lastly described in a Traditional (Fig. 1 and 2) extensive model. The model describes PPA 2007's hypothesized effect on TCs. Using factor loadings and regression relationship between constructs, they were used to test the advanced hypotheses and estimate Tcs.

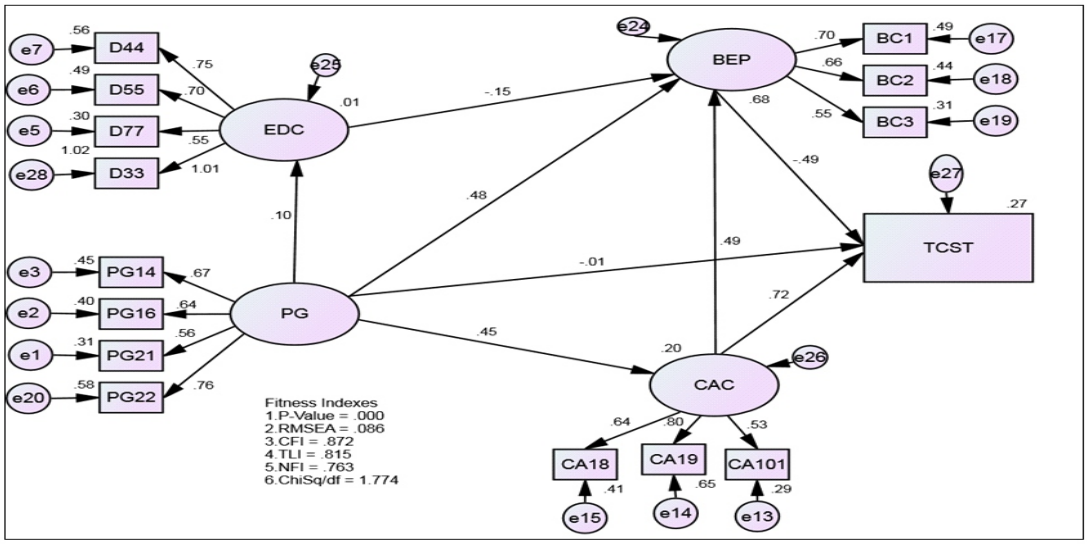

Figure 1. First transaction costs of bidding structural model

Result of the first iteration was carried out (Figure 1) on structural measurement model of transaction costs of bidding indicated that all the factor loadings have achieved the recommended value of >=0.5 except D33 which is too high having 1.01. The fitness indexes of, CFI= 0.872, TLI = 0.815, NFI = 0.763, RMSEA = 0.086 and Chi Sq/df = However, there was unacceptable TLI, NFI of 0.0815, 0.763 and low factor loading of less than 0.5 in D33. Therefore, to improve the model, modification indices were examined to identify variables that have a redundancy problem or too high and use covariance to improve them.

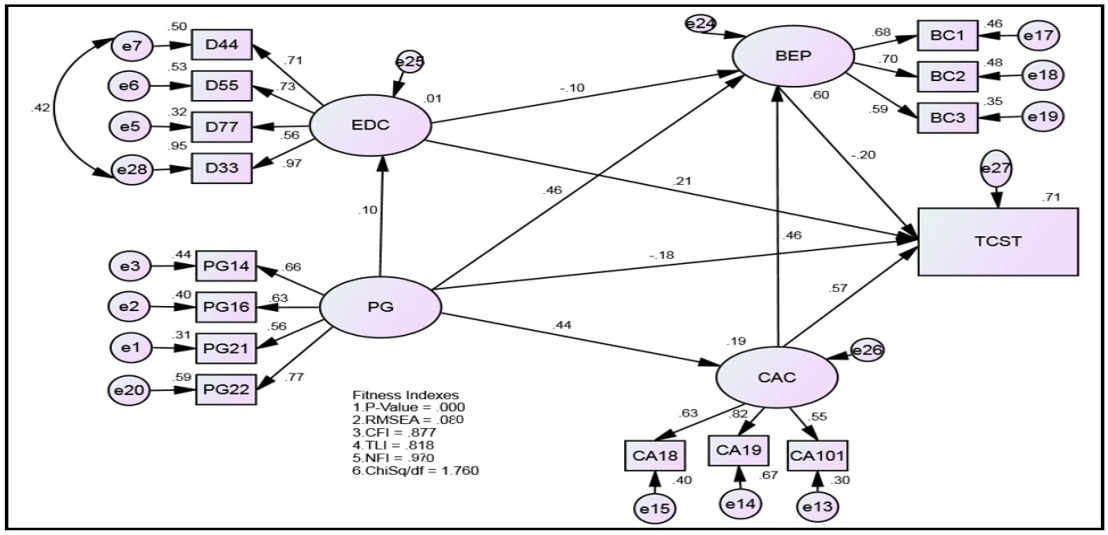

Figure 2 Revised transaction costs of bidding structural model

In the meantime, modification indices stated that the covariance between e28 and e7 improved the loading factor to 0.96. Result for the updated structural model (Figure 2) reveals a decent loading factor of 0.5 in all variables. In the same vein, after covering D33 with RMSEA= 0.080, CFI=0.877, TLI=0.818, NFI=0.970 and ChiSq / df= 1.760= 4.0, the fitness indexes show good results. This model has been used to estimate bidding transaction costs for building projects under the 2007 PPA.

However, a standardized regression path coefficient was used to show impact between constructs (Purchase Guides (PG), Eligibility Document Costs (EDC), Bidding Expenditure Process (BEP), Contract Administration Costs (CAC) and Tendering Transaction Costs (TSCT). These path coefficients described the causal impact of PG, EDC, CAC and BEP autonomous constructs on TSCT dependent structure. To summarize the debate, the result of the final transaction costs of the bidding model was

obtained in Table 1. The table demonstrates that the connection between ($p<0.05$) PG and CAC, EDC, BEP; CAC, EDC and TSCT has been important. But between PG and TSCT, it's not important ($p>0.05$); BEP and TSCT.

Table 1 Parameter Estimate for final structural model of transaction costs of bidding

Paths	Standardized Estimate	Unstandardized Estimate	S.E.	C.R.	P	Result	Hypotheses
BEP <--- CAC	0.46	.420	.139	3.026	**.002**	Sig	Supported
BEP <--- EDC	-0.10	-.056	.056	-.998	.318	N.Sig	Not Sup
TCST <--- BEP	-0.20	-717682.196	849488. 243	-.845	.398	N.Sig	Not.Sup
TCST <--- CAC	0.57	1862257.688	629563.835	2.958	**.003**	Sig	Supported
TCST <--- PG	-0.18	-431130.599	410030. 034	-1.051	.293	N.Sig	Not Sup
TCST <--- EDC	0.21	429167.106	204047. 768	2.103	**.035**	Sig	Supported

In addition, standardized estimate findings showed that a unit shift in TSCT's EDC, CAC, BEP causes 0.21, 0.57, and -0.20. The negative sign shows that when bidding, an increase in BEP would have a adverse impact on a contractor's transaction costs. Therefore, since the model endorsed some of the bidding transaction cost hypotheses, it is appropriate for use in estimating contractor bidding transaction costs for building projects under the 2007 PPA.

Findings/Discussions

Applying the model using current situation in the contracting business in bidding processes

The data analysis in the earlier parts demonstrates that a present scenario requires validation of the structural model (Figure 2). As mentioned, the validity of the criterion is the most appropriate test for simultaneous and predictive validity. Thus, this research utilizes simultaneous validity (Rajeh, 2014) by implementing the structural model in actual contract bidding instances in distinct kinds of constriction applications for the present assessment of TCs in building project bidding.

Predictive validity is used in the project bidding for TCs. The present research utilizes predictive validity to estimate TCs to

assist future research in calculating TCs for other transaction cost sources not captured in this research. In estimating TCs and subsequent validation within the studies, these demands are essential, this practice is consistent with (Love, Morgan, Trnka, & Grubbs, 2002).

Data were gathered from potential contractors involved in the building of infrastructure, housing and non-residential structures in the North-West region of Nigeria to determine the TCs incurred as a result of the acquisition of eligibility papers, the bidding of costs and the administration of contracts for various project kinds. Practicality considerations were taken to obtain genuine and accurate information by implementing the models in the bidding procedures at a fair amount of actual expenditures for the business. A survey questionnaire was provided to 10 separate contractors in the distinct research region countries that are fully involved in the bidding procedures of the federal government's building project. This included two from Kaduna, four from Abuja and four from Sokoto bidding over the past three years on different kinds of building projects.

The questionnaire was designed to test the model that was created from the primary survey data analysis. The main theme is to set a benchmark on how to calculate building project bidding cost TCs using the PPA 2007 to see the magnitude of expenses incurred by contractors when bidding for chosen components. The results from this questionnaire provide an additional insight into the comprehension of TCs in the procurement of building projects using PPA 2007. New contractors or someone who intends to do contracting company may also understand his / her economic commitment prior to entering into the company by undertaking this practice. Similarly, the Act's efficacy in decreasing the expenses of contracting company as one of its primary purposes.

The purpose of the second portion of the questionnaire is to estimate the magnitude of TCs for the PPA 2007 bidding process. It needs contractors or respondents to state in relation to other bidding operations the quantity spent annually on eligibility papers, bidding process and contract management. Contractors were asked to state the amount they spent annually on the evidence certificates of the Pension Commission (PENCOM CERT), the Insurance Trust Fund (NSITF CERT), the Industrial Training Fund (ITF CERT) and

the Nigeria Financial Regulation Council (FRCN).

While the bidding method includes the technical bid manufacturing, transportation / communication and accommodation / feeding expenses incurred in bidding the federal government projects at different locations in Nigeria on average over the past three years. During the contract management stage (including 5 issues), contractors were needed to assess the time it took them to negotiate for a specified contract and the average amount of projects they bid for in the last three years (2015, 2016 and 2017).

Table 3 Average Amount Spent in Construction Project Bidding Processes

Respondents' Area	Project Type	Type of Costs	Measure	Amount Spent Each Year (Naira)			Total Amount Spent (Naira)
				2015	2016	2017	
Abuja	Infrastructure	**Eligibility Documents**	PE NC OM CE RT.	3 5 0 , 0 0 0	3 5 0 , 0 0 0	3 5 0 , 0 0 0	
			NSITF CERT	20,000	20,000	20,000	
			ITF CERT	50,000	50,000	50,000	
			FRCN CERT	300,000	350,000	300,000	
			Total	**720,000**	**770,000**	**720,000**	**2,210,000**
			Technical bids Production	100,000	200,000	120,000	

		Bidding Expenses	Transportation/ Communication	100,000	200,000	220,000	
			Accommodation/feeding	120,000	100,000	100,000	
			Total	**320,000**	**500,000**	**440,000**	
				2015	2016	2017	
		Eligibility Documents	PENCOM CERT.	350,000	385,000	385,000	
			NSITF CERT	20,000	30,000	30,000	
Abuja	Housing		ITF CERT	50,000	50,000	50,000	
			FRCN CERT	300,000	300,000	300,000	
			Total	**720,000**	**715,000**	**715,000**	**2,150,000**
		Bidding Expenses	Technical bids Production	120,000	220,000	150,000	
			Transportation/ Communication	155,000	200,000	250,000	
			Accommodation /feeding	220,000	120,000	280,000	
			Total	**495,000**	**540,000**	**680,000**	**1,715,000**

			2015	2016	2017	
		PENCOM CERT.	350,000	385,000	385,000	
		NSITF CERT	20,000	30,000	30,000	
Abuja	Non-Residential	ITF CERT	50,000	50,000	50,000	

Eligibility Documents

	FRCN CERT	300,000	300,000	300,000	
	Total	**720,000**	**715,000**	**715,000**	**2,150,000**
Bidding Expenses	Technical bids Production	280,000	250,000	160,000	
	Transportation /Communication	195,500	200,000	230,000	
	Accommodation /feeding	310,000	185,750	280,000	
	Total	**785,500**	**635,750**	**670,000**	**2,091,250**

Table 3 and 4 summaries the average amount of money spent by a contractor on infrastructure bidding in the various MDAs within the last three years. Data analysis shows that contractors spent an average amount of =**N= 1,500,000/yr** for participating in the construction project bidding/ activities. Yet because the contractor who is conducting activities that might have a percentage of overlapping between them, it might compromise or reduce the exact amount spent on each type of costs alone. Processes such as contract negotiation, document processing and feeding might overlap between each other.

Table 4. Average Amount Spent in Construction Project Bidding Processes

Respondents' Area	Project Type	Type of Costs	Measure	Time Spent / No. of bids Each Year 2015	2016	2017	Total (A)	Amount per hr and per bid lot (B)	Total Amount Spent (A*B)
Abuja	Infrastructure		TN	45hrs	0hrs	21hrs	66hrs	1,187.50	78,375.00
		Contract Admin	ANB	13	18	18	115 bids	25,000	2,875,000
								TOTAL	**2,953,375.0 0**
				2015	**2016**	**2017**			
Abuja	Housing		TN	35hrs	20hrs	42hrs	97hrs	1,187.50	115,187.5
		Contract Admin	ANB	20	9	11	40 bids	35,000	1,400,000
								TOTAL	**1,515,187.50**
				2015	**2016**	**2017**			
Abuja	Non-Residential		TN	25hrs	15hrs	16hrs	56hrs	1,187.50	66,500
		Contract Admin	ANB	20	17	21	58 bids	25,000	1,450,000
								TOTAL	**1,516,500**

The TCs are calculated on the grounds of the assessment of the regression equation, which is explained in the developed by the coefficients of the interrelationship force between latent variables. In order to deal with study problems, simple and multi-regression analyze were implemented. Simple regression includes measuring a single measured dependent variable while more than one measured independent variables are involved in various regressions. Both suppose that the

information used for evaluation has a normal distribution and that the dependent and independent variables are evaluated directly during the phase of information collection.

The regression equations (1.0 to 1.3) predict the quantity incurred by a contractor in the type of infrastructure when making a project bid. Equation 4.3 predicts TCs for the method of bidding. These equations have been developed as follows in the standardized weight of regression:

Scenario No 1.(Infrastructure Project Bidding)

Using the information in Table 3 and 4 to calculate the TCs for the infrastructure bidding as follows:

$TC_1 = \beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

Therefore:

$EDC_1 = \beta_0 + 0.97*$PENCOM + 0.71*NSITF + 0.73*ITF + .56*FRCN +e

EDC = 429,167.106+ 0.97* 350,000 + 0.71*20,000 +0.73*50,000 + 0.56*300,000 +0.74 = 429,167.106+339,500+14,200+36,500+168,000+0.74= **N987, 367.85**

$BEC_1 = \beta_0 + 0.68*$BC1 + 0.70*BC2 + 0.59*BC3 +e

BEC = -717,682.196+ 0.68*320,000+ 0.70*0 + 0.59*0 + 0.09= **-N500, 082.196**

$CAC_1 = \beta_0 + 0.33*$TN + 0.63*ANB + 0.82*ANB2 + 0.55*ANB3 + e

CAC = 1,862,257.688 + 0.33*53,437.50 + 0.63*325,000 + 0.82*0 +.55*0 + 0.40= 1862257.688+17,634.38+204750+0.40 = **N2, 084,642.07**

TCs = $\beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

Tcs = 0 + 0.21*987,367.85 + 0.20*500,082.196 + 0.57*2,084,642.07 + 0 =**N1, 495,609.66** for the year 2015 only.

Similarly, the year 2016 and 2017 as follows:

TC_{2016} = 0 + 0.21*1,015,367.106 + 0.20*367,682.11 + 0.57*2,231,258.09 +0=**N1, 558,580.62**

TC_{2017} = 0 + 0.21*987,367.85+0.20*458,082.10 + 0.57*2,117,987.47 = **N1, 506,216.53**

Scenario No 2 (Housing Project Bidding)

Using the information in Table 4.44 and 45 to calculate the TCs for the housing projects bidding as follows:

$TC_1 = \beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

Therefore,

$EDC_{2015} = 429,167.106 + 0.97*$ 350,000 + 0.71*20,000 +0.73*50,000 + 0.56*300,000 +0.74=

N987, 367.85

$BEC_{2015} = \beta_0 + 0.68*BC1 + 0.70*BC2 + 0.59*BC3 + e$

$BEC_{2015} = -717,682.196 + 0.68*495,000 + .70*0 + 0.59*0 + 0.09 =$ **- N387, 882.106**

$CAC_{2015} = \beta_0 + 0.33*TN + 0.63*ANB + 0.82*ANB2 + 0.55*ANB3 + e$

$CAC_{2015} = 1,862,257.688 + 0.33*41,562.50 + 0.63*700,000 + 0.82*0 + .55*0 + 0.40=$

N2, 316,973.72

$\mathbf{TCs_{2015}} = \beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

$\mathbf{TCs_{2015}} = 0 + 0.21*987,367.85 – (-0.20*387,882.106) + 0.57*2,316,973.72 =$**N1, 605,598.69** for the year 2015 bidding in housing project. Similarly, for 2016 and 2017 as follows:

$Tcs_{2016} = 0 + 0.21*1,028,417.85 –(-0.20*339,682.106) + 0.57*2,185,795.19 =$**N1,529,807.43**

$TCs_{2017} = 0 + 0.21*987,367.85 + 0.20*316,482.106 + 0.57*2,090,466.84 + 0=$ **N1, 462,209.77**

Scenario No 3.(Non-Residential Project Bidding)

Using the information in Table 4.46 and 47 to calculate the TCs for the Non-Residential building projects bidding as follows:

$TC_1 = \beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

Therefore,

$EDC_{2015} = 429,167.106 + 0.97*$ 350,000 + 0.71*20,000 +0.73*50,000 + 0.56*300,000 +0.74=

N987, 367.85

$BEC_{2015} = \beta_0 + 0.68*BC1 + 0.70*BC2 + 0.59*BC3 + e$

$BEC_{2015} = -717,682.196 + 0.68*785,500 + .70*0 + 0.59*0 + 0.09=$ **-N183, 542.196**

$CAC_{2015} = \beta_0 + 0.33*TN + 0.63*ANB + 0.82*ANB2 + 0.55*ANB3 + e$

$CAC_{2015} = 1,862,257.688 + 0.33*29,687.50 + 0.63*500,000 + 0.82*0 + .55*0 + 0.40 =$

N2, 187,054.56

$\mathbf{TCs_{2015}} = \beta_0 + 0.21*$ EDC -0.20*BEC +0.57*CAC +e

$\mathbf{TCs_{2015}} = 0 + 0.21*987,367.85 + 0.20*183,542.196 + 0.57*2,187,054.56$

N1, 490,676.79 for the year 2015 bidding in Non-Residential building project similarly, for

2016 and 2017 as follows:

TCs_{2016} =0+0.21*1,028,417.85+0.20*272,657.106+0.57*2,216,636.213+0= **N1, 533,981.81**

Tcs_{2017} =0+0.21*1,028,417.85 +0.20*322,382.106 + 0.57*2,157,278.09 +0= **N1, 510,092.69**

Table 5: Summary of the TCs for Different Construction Projects Bidding

Transaction Costs For Three Different Types Of Project Bidding Using PPA 2007				
Projects Type	**2015 TCs**	**2016 TCs**	**2017 TCs**	**Total Cost**
INFRASTRUCTURE PROJECT	N1,495,609.66	N1,558,580.62	N1,506,216.53	**N4,560,406.81**
HOUSING PROJECTS	N1,605,598.69	N1,529,807.43	N1,462,209.77	**N4,597,615.89**
NON-RESIDENTIAL BUILDING PROJECTS	N1,490,676.79	N1,533,981.81	N1,510,092.69	**N4,534,751.29**
TOTAL COSTS INCURRED	N4,591,885.14	N4,622,369.86	N4,478,518.99	**N13,692,773.99**

Discussion

A model was suggested based on the conceptual research model that captured contractors ' extent of transaction costs when bidding for various kinds of project building figure 1.2. The model showed the interrelationship of the independent variable with the dependent variable. A regression equation for the calculation of transaction costs (TCs) of bidding was produced from the relationship as mentioned in section one. The model created has been validated in bidding with true life situation as shown in chapter scenario 1 to 3.

Based on the model's validation, it was calculated that the magnitude of TCs is N1,495,609.66 as a result of the 2015 infrastructure bid; 2016 is N1,558,580.62 and 2017 is N1,506,216.53 with a total of TCs incurred for three years as N4,560,406.81. Thus, for a three-year housing project bid as shown in Table 5, N4 is 597,615.89. Similarly, in the bid amounting to N4, 534,751.29, non-

residential construction has complete expenses incurred by the contractor. Contractor spent on bidding for multiple building projects at MDAs under the PPA 2007 Act averages of N1, 500,000.

The outcome is distinct from Rajeh's (2014) results, which indicate that the TCs for two distinct distribution systems (traditional and Design and Build) represent 18.5 percent and 14.5 percent of the project management's annual salary costs and captured only data, administration, implementation and procurement operations. Whereas, by Bayesian theory, Farajian (2010) estimates the TCs for PPP in the US and all information gathered is with the nation of Europe. This demonstrates a significant distinction in terms of place, procurement regulations, the size of infrastructure projects and the readiness of private investors to participate in bidding the multiple nations by government.

The research sees bidding costs only as; tendering documentation preparation and negotiation costs, while the present study considers bidding costs only as; eligibility papers, bidding expenditures and contract administration costs as mentioned in the PPA 2007. In addition, the outcome shows that contractors in Nigeria are spending a lot of cash on bidding for infrastructure, housing or non-residential buildings. Construction companies incurred TCs in Nigeria differ considerably from those in Europe, Czech Republic, and New Zealand. The TCs are around $4,100 in Nigeria, while in Europe, Czech Republic and New Zealand are $781, CZK 22,489, and $78,354 ((Dufek, 2013; Farajian, 2010; Rajeh, 2014).

Implications of Tcs

This research discovers a important connection for building projects between government procurement guides, eligibility documents costs, bidding costs, contract administration costs, and TCs. The finding has consequences for building business practice because the study is empirical in nature, based on the experience of building companies, case studies and feedback. The research is also based on a solid theoretical structure (Fig. 1) illustrating the effect of TCs on procurement guides and related practice in building projects.

The results enable the evaluation of TC's institutional and economic consequences, which shows how the implementation of the TC's view changes the organizational dynamics of the Construction and Procurement Act 2007. The model created will inform strategic thinking on the

significance of defining bidding costs in the procurement of building. Focusing solely on building project manufacturing costs and winning tender is not enough to save expenses, minimize allegations, and reduce conflicts and conflicts in building projects. The interaction of transaction costs and the costs of document preparing (technical and financial bids), contract administration, and bidding expenses, which were obviously proved by the present research inquiry, need to be considered further.

Conclusions

Evaluation of transaction costs offers a practical structure for choosing the right distribution systems in building. Many scientists have applied the TCE notion to various subjects in building Rajeh (2014) using the traditional definition of transaction costs and categorizing them into four primary components to create a model for TCs: search / information expenses, enforcement costs, project procurement costs, administration costs and professional costs. Šumpíková, Bušina, Grega, Nemec, and Orviská (2016) try to assess transaction costs in Czech and Slovak public procurement and categorize transaction costs into four primary classifications: cost of tendering, cost of complaint, cost of legal documentation and cost of outsourcing.

In Li *et al.,* (2012 and 2013) research on transaction costs incurred by building managers, they create the model based on project performance expenses, transaction cost magnitude, environmental uncertainty, transaction owners ' position and contractors ' role in the transaction. Priyanto, Mazkie, and Khusaini (2014) evaluate the impacts of asymmetric information, corporate governance transaction costs, and Malang performance of public organizations. They create a framework job that shows how corporate governance and efficiency have been impacted in some Malang organizations because of the impact of asymmetric information and transaction costs. This research has demonstrated the ability to estimate the magnitude of TCs for three distinct kinds of bidding for building projects. The TCs connected with infrastructure, housing and non-residential buildings (e.g. eligibility documents, bidding costs and contract administration) are therefore determined on projects procured by open competitive tendering as needed by PPA 2007.

A cross-sectional sample method involving survey questionnaires was implemented and the inquiry results were checked using instances of "true life." In infrastructure,

data were gathered from construction companies; housing and non-residential construction projects (e.g. infrastructure, civil and construction contractors). TCs were evaluated using expenditure on bidding operations linked to building projects as a cost surrogate. Participants assessed their costs spent on procurement operations (using a Likert scale 1-5) within Traditional procured projects. The information gathered was evaluated using a modeling method for structural equation.

Building projects offering TCs are determined by a model or structural model created for path analysis using SPSS 20 and Amos 21. Structural and test models were used to determine: first, the presence of a single latent independent variable as a consequence of a collection of test products, and second, the connection between the latent variable and observed variables through the direction of track and the strength of the coefficients. In conclusion, for companies with distinct eligibility documents value with distinct moment and lot buy, the quantity of TCs related to eligibility documents costs for infrastructure, housing and non-residential structures was discovered to be N987, 367.85; N987; N500, 082.196 for infrastructure bidding expenditures and N2, 084,642.07 for infrastructure contract administration respectively.

Finally, it is discovered that the Nigerian economy has benefited from the emerging contracting company industries naturally. Meanwhile, the tendering procedures that are widely recognized as a rare display of transparency, fairness and responsibility have turned the country's fortunes around and thus enhanced the trust of the contracting firm in the Nigerian economy and company. Similarly, the nation has also benefited Nigerian investors in the aspect of job generation in line with the goals of local content development act.

Other advantages include reducing the distribution infrastructure of overseas contractors or companies, cost of manufacturing, enhanced business efficiency, attraction of local resources, enhanced technology, human development, and a host of others. We therefore conclude that the adoption of the Procurement Act has had a very beneficial and substantial effect on Nigeria's financial situation, particularly in terms of public responsibility, economy and transparency in bidding for building projects.

Recommendations

The following suggestions were produced to the procurement regulatory body in Nigeria, namely the National Public Procurement Council (NCPP), the Bureau of Public Procurement (BPP) and the Federal Government of Nigeria, from the results and conclusions provided above. The government should amend the present sections of the PPA 2007 Act and immediately reduce some of the requirements or requirements set out in those parts to be qualified to bid for work by the federal government. In order to attain this objective, less payment for a bid document of less than N10,000 should be regarded as the Bureau began in 2017, in order to enable healthy competition among building companies. This will lead to enhanced participation of native companies, patronage of home-made products as seen in the ICT and automotive industry, and thus increased job creation in the nation.

Therefore, the federal government needs to provide the contracting companies with the required friendly company setting (especially payments and collection of CAC registration, pencom and tax clearance certificates) so that they can participate and recover their transaction expenses incurred from later unsuccessful bidding. Since contracting companies complained that high operating headquarters costs, bidding documents needed by MDAs, contract administration and less profit margin are some of the variables responsible for the elevated price of building project bidding in Nigeria today owing to increased competition from contractors and MDAs requirement or criteria.

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