Assessing the Cost of Competitive Tendering using Transaction Cost Theory

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Abstract

Competitive tendering, even though, can enhance the achievement of value for money in public procurement, it comes with a huge cost to both the procuring entity and the bidders. However, the subject is highly under researched.

Purpose: The purpose of this study is to determine the cost contractors incur when tendering for a project procured through the National Competitive Bidding (NCT) method of procurement under the Public Procurement Act 663 (as amended) Act 914 (2016) of Ghana.

Methodology: The research draws extensively on ethnography method to collect cost data on Fourteen (14) different tenders submitted by a financial class D1/K1 contractor. Through the lenses of the Transaction Cost theory, the data is analysed and the actual cost determined. Further, Spearman rank correlation is employed to establish a relationship between Tender price and the cost of tender by the aid of Statistical Package for Social Sciences (SPSS) version 23.

Findings: The research revealed that, apart from the emotional and psychological costs, contractors in Ghana incur approximately Gh₵ 4,625.00 (US$ 925) - Gh₵ 2,520.58 (US$ 504.15) to prepare and submit a competitive tender. In relation to the tender figure, the TC of tender in Ghana ranges from 0.05% to 0.65% and an average of 0.33%. Also, there is an inverse correlation between tender price and the percentage cost of tender.

Originality: This study is the only known research that has focused on assessing the cost of public sector competitive tendering from a contractor's perspective and within a developing sub-Saharan African context.

Limitation: The research was conducted within 12months period where only 14 competitive tenders were submitted by the contractor and were therefore considered for the analysis. Findings from the study can only be generalisable to developing countries with similar socio-economic profile to Ghana.

Keywords: Competitive tendering, Cost of Tendering, Transaction Cost, developing country

Introduction

Competitive tendering is pivotal to the concept of contracting which has been employed in the public sector reforms across the globe. It emphasises on the use of markets and competition and

has been believed to offer value-for-money and encourages more service providers to participate in public procurement whilst reducing favouritism, fraud and corruption (Vincent-Jones, 1994; Erridge *et al*., 1999; Chinyio, 2011). However, there is currently no study revealing the cost of tender from the contractor's perspective in a developing country like Ghana. Also, transaction cost economics theory has been applied in numerous studies for the assessment of tendering costs associated with public-private partnership (PPP) arrangements (De Schepper *et al.*, 2015; Ping Ho *et al.*, 2015; Soliño and Gago de Santos, 2016; Thomassen *et al.*, 2016). However, there is a lack of studies that have applied TCE as a theoretical lens in analysing the transaction cost associated competitive tendering during public procurement.

With the introduction of new requirements in the evaluation criteria in the amended law (Act 914), a study that seeks to establish the cost of tender from the contractors' perspective can only be timely. The purpose of this study is therefore to:

- find out the component costs incurred by the contractors when tendering under National Competitive Tendering
- determine the cost contractors incur when tendering for a project
- determine a correlation between the cost of tender and tender figure

In the following sections of the paper, literature on tendering cost and the transaction cost economics (TCE) theory will be presented and applied as a theoretical framework for the study. This is then followed by the research methodology, results and discussions. Finally, the conclusions of the study, which provides reflections on the implications of the study's findings is then presented.

Literature Review

Tendering is the process of acquiring goods, works and services especially by public institutions. Brett (1997) defined tendering as '*the production and submission of a tender price for carrying out certain stated building works based on a study of the contract documents*. According to CIOB (2009), tendering is '*the process of preparing and submitting for acceptance a conforming offer to carry out work for a price, thus converting the estimate to a bid*'. Tendering is therefore a tool for the procuring entities to select a service provider, and also a means by which a tenderer i.e. a supplier, consultant or contractor gets the right to either supply a good, deliver a service or construct a project (Chinyio, 2011). Tendering does not happen only between a client and a supplier, consultant or a contractor. However, it could also happen between the interface of contractor and sub-contractor; contractor and supplier, and sub-contractor and supplier etc. (Connaughton, 1994; Hoxley, 2000). The purpose of adopting a tendering process in procurement is to select a service provider; test the current market; and more importantly to comply with regulations in the public space (Taylor-Roe, 1995). The overarching goal of tendering is to obtain value-for-money (VfM) and also provide equal opportunities for businesses within a particular jurisdiction (see Act 663 as amended 2016 procurement Act of the republic of Ghana).

Generally, the two main tendering methods are negotiated tendering and competitive tendering (Chinyio, 2011). Competitive tendering is mostly preferred due to its ability to ensure accountability, transparency, obtain the best fit service provider and offer VfM. The competitive type can either be open or restricted tendering. Whilst the latter starts with prequalification, tender

documentation and tendering/bidding, the former only employs the last two. Due to the inherent procedures, competitive tendering comes with a huge cost to both the tenderer and the tenderee. Filippini *et al.* (2015) highlight that the competitive tendering process can pose high administrative costs for procuring entities. Nevertheless, it is the default tendering method in most procurement laws across the globe because of the belief that it avoids the accusation of favouritism and fraud, reduces prices, improves quality and encourages more service providers to participate (Erridge et al., 1999 (Nash and Wolański, 2010)). Competitive tendering has been found to lower costs by up to 11% (Odolinski and Smith, 2016). The perceived benefits and the corresponding expenditures associated with the process (competitive tendering) have brought some disunity among industry players and researchers. Whilst a study by Filippini *et al.* (2015) found no significant difference between the cost efficiencies achieved through competitive tendering and performance-based negotiation in the provision of public transportation services in Switzerland, they concluded that the possibility of using competitive tendering has a disciplining effect during procurement. Both arguments have not been supported by empirical evidence due to the low research output on the overall cost of tender to the parties. Few studies on the subject include, for example, Ameyaw *et al.* (2013) who investigated the cost of tender from the client's perspective and concluded that it cost the client 0.5% of project cost in Ghana. Chinyio (2011) revealed a cost of tender in the UK to average £30,000 (Chinyio, 2011) and Anecdotal evidence from NSW, WA, Victoria and SA is that a standard tender can cost the client around $10,000 to $25,000 to conduct or 10 percent of project cost (LGA of South Australia) and the Contractor costs can range from $10,000 and $25,000 to respond to a tender (LGA of South Australia).

Theoretical Framework

The term "transaction" is the process of transferring ownership of an economic resource from one actor to the other (Kale and Arditi, 2001). Transaction cost (TC) is therefore the costs of running an economic system (Williamson, 1991). Wang (2003) simplified the meaning of TC, and referred to it as the economic value of what goes into identifying trade partners and the transaction itself as the measure of transaction cost. According to financial economists, transaction cost refers to the cost of investing in financial markets, including brokerage fees (Bhardwaj and Brooks, 1992).
The original understanding of TC was associated with "the cost of using the price mechanism" or "the cost of carrying out a transaction by means of an exchange on the open market" (Coase, 1937; 1961 cited in Wang, 2003). Coase (1961) provided further clarification by asserting that before engaging in any transaction, transactors would have expended resources to search and identify a willing transactor, establish and negotiate the terms of the transaction, design the contract, supervise or inspect to ensure compliance with the terms of the agreement among others. These costs according to Williamson (1985) could be categorized into ex ante and ex post. The former refers to the costs of drafting, negotiating, and safeguarding an agreement whilst the later arises when contract drift out of alignment, thus the costs incurred to bring the contract back on track which includes the cost of managing the transaction, and the costs of ensuring that parties commit to the terms of the transaction. Downes and Mui (1998), however, identified six different sources of transactions costs namely: search costs; information cost; cost of doing due diligence in terms of buyer's financial standing, need, and legal status; bargaining costs; decision cost; policing costs; and enforcement cost.

TC is considered to be influenced by three main attributes namely; asset specificity, uncertainty and frequency (Williamson, 1984). The most significant attribute among these is asset specificity. Asset specificity has been described as the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value. Six kinds of asset specificity have been identified by Masten *et al*. (1991): site specificity, physical asset specificity, human-asset specificity, brand-name capital, dedicated assets, and temporal specificity/technological non-separability. Another important attribute of TC is frequency of transaction. Two kinds of frequency exist namely; frequency of transaction between two specific actors and frequency for specific goods among several actors (Rindfleisch and Heide, 1997). For the former, opportunistic behavior is reduced when several transactions are expected between the two parties (Heide and Miner, 1992). The later requires idiosyncratic investment for each transaction because of the non-standard nature of the goods or services. The other attributes of TC beside asset specificity and frequency is uncertainty. Certainty in the lenses of TC is all about the security of the transaction. Uncertainties may be considered as the risk associated with the entire transaction. The higher the risk, the higher the transaction cost and the overall cost of the deal.

The measure of TCs have become a thorny issue with a clear lack of theoretical consensus in empirical studies as to how best it should be measured (Wang, 2003). While some scholars attempt to put an absolute figure to the measure of TCs (Wallis and North, 1986, Polski, 2000; Stoll and Whaley, 1983; Collins and Fabozzi, 1999), Williamson (1975, 1985, 1996, 1998, 2000) believes it is impractical and not necessary and could best be achieved using proxies such as uncertainty, transaction frequency, asset specificity, and opportunism. Williamson (1998) observes that, attaching absolute figure to TCs is not the paramount, but rather relative ranking of TCs of different organizations and contractual choices.

Conceptualizing the Application of the TC

In competitive tendering, contractors' respond to an invitation to tender which comes with some specific requirements. As per the discussion in the literature review, for a contractor's tender to be considered as substantially responsive, the tenderer must meet some mandatory requirements known in TC as Legal Status (LS_{TC}). The legal status requirement in Ghana includes: Public Procurement Authority Contractors' Registration Certificate, Certificate for Incorporation, Certificate to Commence Business, Ministry of Water Resources, Works and Housing Classification Certificate, Value Added Tax (VAT) Registration Certificate, Tax Clearance Certificate, Social Security and National Insurance Trust (SSNIT) Clearance Certificate and Labour Clearance Certificate. These are all acquired at a cost and as such must be accounted for in the cost of tender equation.

Furthermore, clients or their representatives (consultants), in the bid to ensure the credibility of the potential project executor, may do some due diligence to ascertain the financial standing of the competing firms. The cost incurred by the tenderers in meeting this requirement may be termed as Due Diligence requirement costs (DD_{TC}). The cost variables under the DD_{TC} include Auditor's report/Financial Statement, Line of Credit and Letter to seek reference. The preparation and

submission of these requirements may not come without cost and must therefore be accounted for in the estimation of the cost of tender.

Tender Security (TS_{TC}), is a transaction cost associated with the desire of the client to receive assurances from the tenderers that the latter will stand by their tender and that the tender figures remain valid within the tender validity period. The tenderers would necessarily receive a bid bond from a third party, thus an insurance firm or bid guarantee from a bank. In the case of a bid bond, a premium is paid by the tenderer to the insurance firm and in the case of a bid guarantee, the bank would require the amount of the bid security to be lodged in the account of the tenderer within the bid validity period. This is a major TC which must feature prominently in the TC equation.

Additionally, Information and Transportation cost (IT_{TC}) are costs associated with communication (telephone) cost which arises during collation and updating of cost data during the pricing of the tender document and the preparation of the tender as a whole. In some cases, one has to move to suppliers to take invoices of various materials to be priced in the tender. Transportation cost for the purchase of the tender documents (in the absence of electronic procurement), site visits to aid in the preparation of site visit report, submission request of letters statutory institutions GRA, SSNIT, LO, Banks, Insurance companies and collection of the prepared clearance certificates. Besides the fee contractors' pay to secure some of these certificates, the transportation cost associated with the request and collection must duly be accounted for.

Personnel Remuneration cost PR_{TC} is a cost associated with personnel emoluments especially those responsible for the pricing and preparation of the tender documents. Mostly, estimators, Quantity surveyors, auditors (for the preparation of auditors reports to support the tender), messengers and other office Assistants. Personnel Remuneration Cost can be classified as the cost of the man-hours expended to ensure a successful submission of the tender.

In the absence of electronic procurement, tenderers are required to pay a fee to acquire the tender document. Even though the cost of the tender document must be the cost for producing the document it can be as high as Three Hundred Ghana Cedis (Gh₵ 300) equivalent to US$60 beside the cost of transportation to the point of sale. Tender Document cost TD_{Tc} is therefore a cost component that must be accounted for in the cost of tender equation.

To assist procurers to ascertain the compliance of prospective contractors, there is usually the request for tenderers to include in their tender Health and safety management plan, environmental and social sustainability plan, site visit report, company profile (works of similar nature previously executed, key personnel, equipment holding, evidence of equipment owned and/or lease agreement for equipment to be leased). These costs can be classified as Other Costs (O_{TC}) of the aforementioned documents ought to be accounted for in the cost of tender.

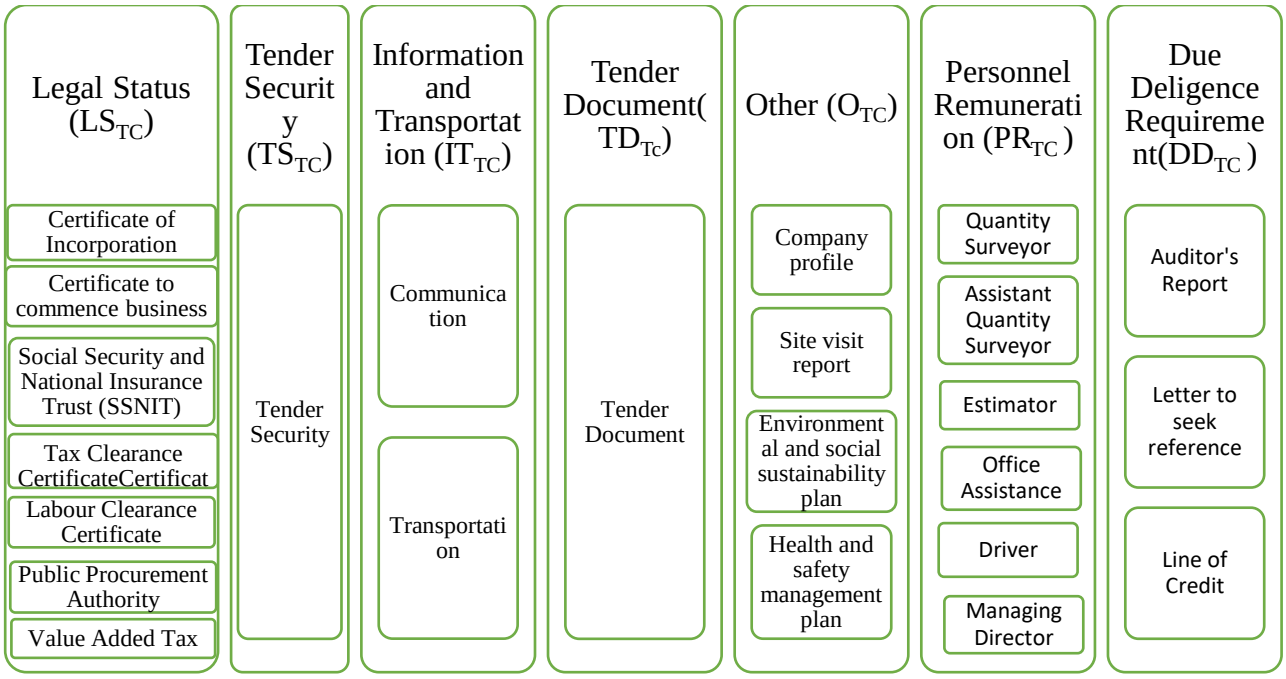

Figure 1: Tender Preparation Framework

From the forgoing and the depiction in fig. 1, it is logical to conclude that TC for the preparation and submission of a tender by a contractor in Ghana could be achieved by summing the individual cost units/items to arrive at the cost cluster and then the various cost cluster as shown in equation 1.

$$LS_{TC} + TS_{TC} + IT_{TC} + PR_{TC} + TD_{Tc} + O_{TC} = TC \quad \text{--- equation 1}$$

Where:

TC: Transaction cost of tender preparation

LS_{TC}: Legal Status

TS_{TC}: Tender Security

IT_{TC}: Information and Transportation

TD_{Tc}: Tender Document

O_{TC}: Other

PR_{TC}: Personnel Remuneration

DD_{TC}: Due Diligence Requirement

Research Methods

The study collected quantitative data, thus cost data on the various tenders prepared and submitted by the contractor. This strategy was employed because most of the information needed was numerical (Leedy and Ormrod, 2005). The research method was ethnography which has "deep and diverse roots (Atkinson et al., 2001, p. 4); developing across diverse disciplines. However, within this quantitative research strategy was used within the context of an ethnographic study, which is a qualitative strategy. It was therefore "grounded in a commitment to obtain first-hand experience and the exploration of a particular social or cultural setting on the basis of participant observation" (Creswell, 2012). According to Pink et al. (2003), ethnography is an approach of investigating social life which can be done in different ways and which of course will produce different results. However, it is the best approach of exploring and appreciating everyday practices of participants on projects (Shipton et al., 2014). Thus, using hardcore data/observed data to explain how something is 'locally constituted' which aids to uncover the nature of a phenomenon (Silverman, 2006, p. 43). The adoption of ethnography method cuts across different fields including construction management research (Shipton et al., 2014). Some approaches used in the construction field include but not limited to long-term studies where the investigator is actively involved in the setting (Baarts, 2009; Thiel, 2013) and approaches such as observation and interviewing (Sage and Dainty, 2012). Notwithstanding, ethnography is sparingly used in construction management research (Shipton et al., 2014) and therefore offer a unique and highly immersed approach to investigating lived experiences such as gathering the cost of tender.

The data was collected by one of the authors. First-hand account of his experiences forms the bases for the data used for the determination of the cost of tender in Ghana. The tender preparation activities and the cost incurred by a Class D1/K1 contractor who is based in Kumasi, the second largest city of Ghana are recorded over 12 months. This was therefore a longitudinal rather than cross-sectional study. Majority of research undertaken in construction management tend to be based on cross-sectional studies and the longitudinal approach was adopted as it was considered that this will provide significant insights that have previously not been captured in relation to the competitive tendering process from a contractor's perspective. The ethnographer has a long association with the firm, working there as the Chief Quantity Surveyor and later as a Projects Manager for several years. This gave the author an unfettered access to information on the subject investigated. The cost data on all competitive tender prepared and submitted by the construction firm within the 12 months period of the data collection were recorded.

Information on various fees paid, items purchased, transportation cost associated with the tender, communication costs, none-receipt payments were all recorded. In some instances, officers sent to carry out those exercises were engaged to provide information on the cost incurred in carrying out any activity connected with the tendering. In some instances, the ethnographer accompanied officers to procure other documentations in connection with the tender. This was to guarantee the credibility of the data being given especially where receipts were not given.

Using a Microsoft Excel spreadsheet, a cost of tender model was developed which aided in the computation of the cost incurred on each cost item resulting in the determination of the cost of tender in Ghana.

Results and Discussions

A total of 14 tenders were procured, prepared and submitted within the 12months period. The projects ranged from a renovation, expansion and new construction of wide range of facilities including two lecture blocks, two lecture pavilions, a hostel, plastic recycling plant, lift installation, pavements and fence wall which were all greenfield projects. Others are, the renovation of a community center, students' hostels, senior staff bungalow, guest house and re-roofing of Great Hall being brownfield projects. The projects were advertised by three (3) different procurement, thus, Kwame Nkrumah University of Science and Technology, University of Education, Winneba and the University of Energy and Natural Resources.

A review of the requirements revealed that the basic attachments to the tender are common across all entities. This is due to the fact that all the procurement entities are public institutions and therefore must comply with the Public Procurement Act 663 as amended (Act 914). The requirement to the various tenders which the contractor provided as attachment to the tender include: Certificate of Incorporation (CoI), Certificate to Commence Business (CtCB), Public Procurement Authority's (PPA) Contractor Registration Certificate, Ministry of Water Resources, Works and Housing (MWRWH) Classification Certificate, Labour Clearance Certificate (LCC), Ghana Revenue Authority's (GRA) Clearance Certificate, Value Added Tax (VAT) Registration Certificate and Social Security and National Insurance Trust (SSNIT) Clearance Certificate. The above were for the purpose of ascertaining the legal standing of the firm. The CoI and CtCB are to be renewed every eighteen (18) months whilst the MWRWH and the PPA certificates are yearly. Also, whilst VAT is one off, GRA, LCC, and SSNIT are project or tender specific, thus clearance is required for every tender.

Further, the tenderer (the firm) was required to provide evidence of its financial capacity in executing the project. Requirements under this subject include; line of credit (LoC) from reputable financial institution, letter to seek reference (LSR) from Bankers and financial statement/auditor's report for the past three (3) or five (5) years. The firm requested the LoC from its bankers which were supplied at all times. The contraction firm at the end of every year prepares its financial statement even before tenders are invited. Therefore, these were mostly photocopied/printed and added to the tender. The LSR is meant to give the consultants/client the right to contact the contractor's bankers to ascertain the liquidity position and the credit worthiness of the firm. So, it is a simple letter from the contractor to the client as part of the attachment to the tender.

Tender security was a permanent feature in all the tenders. It was either a percentage (mostly 2%) of the tender figure of the tenderer or a fixed amount. The tenderer was given the liberty to submit a Tender Bond (from reputable insurance company) or Tender Guarantee (from a reputable bank). In all cases, the contractor requested the Tender security from an insurance company. This was always the preferred option because, once the premium is paid, the security was provided which is not so with a bank guarantee. Banks require the amount of the security to be lodged in the tenderers account before the guarantee is provided which means tying down money which could be used for other works.

The tender preparation involved a lot of personnel in the company. This ranges from office clerks to the Managing Director. It was observed that key staff such as the Chief Quantity Surveyor, Two

Assistant Quantity Surveyors, Office Clerk and a Driver were mostly involved in tender preparation.

Based on data collected, an MS Excel model has been developed to aid in the computation of the TC of tender. Snapshot of the model is presented in appendix 1. The model is based on the theoretical framework presented in fig. 1. Each major cost item is compiled and on a separate spreadsheet and the results linked to the summary page to determine the TC of each project and the percentage to the tender figure. The model provides a framework to easy computation of TC of tender for contractors.

From the analysis, it will cost a contractor an approximately Gh₵ 4,625.00 (US$ 925) - Gh₵ 2,520.58 (US$ 504.15) to prepare and submit a competitive tender. In relation to the tender figure, the TC of tender in Ghana ranges from 0.05% to 0.65% and an average of 0.33% and a standard deviation of 0.21% (see Table 1). This finding puts the cost to the client in preparing and managing the tendering process higher than that of the tenderer if the earlier finding of Ameyaw et al. (2013) is anything to go by. These authors reported the cost of tender from the client's perspective as 0.5% of project cost which is relatively higher.

Table 1: Cost of Tender in Ghana

Description	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Variance Statistic
Transaction Cost (%)	14	0.05	0.64	0.33	0.21	0.044
Tender Security Cost (Gh₵)	14	100.00	758.00	204.14	215.04	46240.286
Legal Status Cost (Gh₵)	14	237.06	238.60	237.35	0.59	0.350
Due Diligence Cost (Gh₵)	14	183.57	183.57	183.57	.00	.000
Personnel Remuneration Cost (Gh₵)	14	1,275.70	1,748.36	1,398.85	108.65	11806.37
Tender Document Cost (Gh₵)	14	200.00	300.00	250.00	51.89	2692.31
Information Transportation Cost (Gh₵)	14	50.28	1,331.00	329.59	368.51	135799.94
Stationary & Printing Cost (Gh₵)	14	66.00	98.00	91.14	13.63	185.67

Further, comparing contractors' TC cost revealed in this study to those of the UK and Australia, it is logical to conclude that contractors' in Ghana spend far less than their counterparts. Whereas the average cost in Ghana is approximately Gh₵ 2,694.45 (US$ 539), those in UK spend an average of £30,000 (Chinyio, 2011) and those in Australia $10,000 and $25,000 to respond to a tender (LGA of South Australia). This perhaps reflects the growing popularity of framework agreements by public procuring entities in the developed countries as this can help minimise the cost of repetitively tendering for contracts through competitive tendering.

From Table 1, Stationery and printing contribute the least cost to the transaction cost whilst the Personnel Remuneration is the single largest contributing over 50% to the cost (see Figure. 2). Information and Transportation cost is the second highest contributor to the TC, thus 12.23%, followed by the cost of purchasing the tender document. This raises the question of how adoption of e-procurement practices can minimise the transaction costs of competitive tendering during public procurement in Ghana and other developing countries. Systems that can facilitate the submission of electronic tenders and the circulation of information to tenderers could minimise the

transaction costs to tenders. However, this will require further transaction cost analysis as the use of electronic systems will pose its own associated costs (electricity consumption and data connectivity).

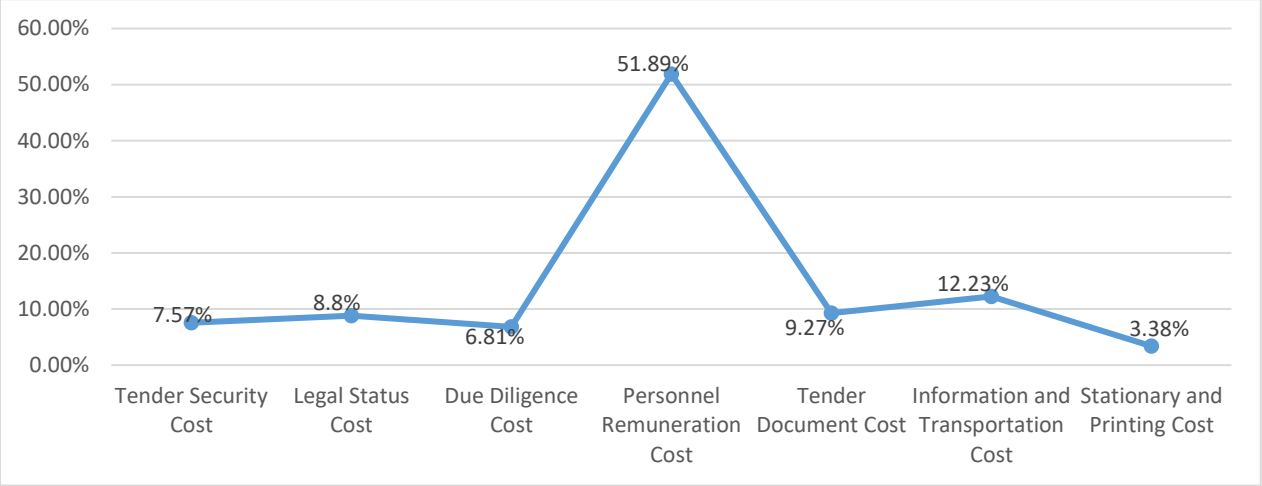

Figure 2: Relationship between Cost of tender and Major Cost Items

Table 2: Spearman's Correlations Between Transaction Cost and Tender Price

			Transaction Cost	Tender Price
Spearman's rho	Transaction Cost	Correlation Coefficient	1.000	-.993**
		Sig. (2-tailed)	.	.000
		N	14	14
	Tender Price	Correlation Coefficient	-.993**	1.000
		Sig. (2-tailed)	.000	.
		N	14	14

**. Correlation is significant at the 0.01 level (2-tailed).

The Table 2 shows a Spearman's correlation for testing the relationship between the TC and TP. The Spearman correlation was adopted to measure the strength of relationship between the TC and TP. The analysis indicates that there is strong correlation at 99% a confidence interval between the contractor's tender figure and the amount of resources required to procure, prepare and submit and substantially responsive tender. The higher the tender figure, the lower the relative TC. There is therefore a negative correlation between the TC and TP. This finding corroborates the report of Chinyio (2011) who revealed that due to economy of scale, as project cost increases, the relative percentage of tendering costs declines. The results may have some implications for the adoption of framework agreement/contracts. This will ensure that competitive tendering is done to cover

several contracts within a specified period of time in order to reduce the financial burden on both procurement entities and contractors.

Limitations

With regard to the applicability of the findings, the research is specific to the local context in which it was carried out. For example, the findings are specific to the type of procurement method. In this case the firm was D1/K1 contractor and the data therefore reflects the cost of contractors of that category. Furthermore, as practices as well as procurement rules are not entrenched, the findings are specific to the time and context. Also, the tenders were only three procurement entities and in some cases a number of projects were advertised together; giving the contractor some cost reduction in transportation cost.

Conclusion

The research sought to determine the component costs incurred by contractors when tendering; determine the cost contractors incur when tendering and also ascertain the correlation between the cost of tender and the tender figure. The study was underpinned by the transaction cost theory based on which a theoretical framework was developed for the determination of TC of competitive tendering in Ghana. Drawing on ethnographic research method and quantitative research strategy, data was collected and analysed using descriptive statistics and spearman correlation by the aid of MS Excel and Statistical Package for Social Sciences (SPSS) version 23.

The study determined the components costs of tender and developed an excel spreadsheet model (see Appendix 1) for the computation of TC of tender. The study concludes that contractors in Ghana spends an average of Gh₵ 2,694.45 (US$ 539) or 0.33% of tender figure when preparing a tender. It has also established that there is a negative correlation between the tender price and the percentage cost of tender. Thus, the higher the project cost the lower the transaction cost, thus percentage of tender price invested in the preparation of the tender.

The above findings have implications for policy and practice. Contractors will find the excel spreadsheet model very useful for easy compilation and computation of TC when preparing competitive tenders in Ghana. The findings also provide empirical information on TC of tendering to contractors as well as policy makers, which will guide the former in deciding whether to tender or not to tender for a project. The latter is also informed that tendering is associated with cost and as such unwarranted abortion of tendering process must be avoided. These findings also raise a further line of inquiry on the impact of e-tendering adoption on the cost of competitive tendering in developing countries. Given that the cost of competitive tendering is much lower than in developed countries, a similar transaction cost of a competitive tendering process that is based e-tendering practices will be beneficial.

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Appendix 1: Transaction Cost Model of NCT

TRANSACTION COST MODEL FOR NATIONAL COMPETITIVE TENDERING

		Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
LS_{TC} Legal Status Costs	Click for Legal Status Costs	238.06	238.06	238.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06
DD_{TC} Due Deligence Costs	Click for Due Diligence Costs	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.00	183.00	183.00
TS_{TC} Tender Security Costs	Click for Tender Security Costs	758.00	100.00	100.00	500.00	100.00	100.00	100.00	100.00	500.00	100.00	100.00	100.00	100.00	100.00
IT_{TC} Information & Transportation Costs	Click for Information and Transportation Costs	1,331.00	712.24	712.24	50.28	50.28	50.28	50.28	50.28	50.28	311.42	311.42	311.42	311.42	311.42
PR_{TC} Personnel Remuneration Costs	Click for Personnel Remuneration Costs	1,748.36	1,275.70	1,275.70	1,388.10	1,388.10	1,388.10	1,388.10	1,388.10	1,388.10	1,391.10	1,391.10	1,391.10	1,391.10	1,391.10
TD_{TC} Tender Document Costs	Click for Tender Document Costs	300.00	200.00	200.00	300.00	300.00	300.00	300.00	300.00	300.00	200.00	200.00	200.00	200.00	200.00
OC_{TC} Other Costs	Click for Production and Print Costs	66.00	66.00	66.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00
	TOTAL TRANSACTION COST	4,625.00	2,775.57	2,775.57	2,757.02	2,357.02	2,357.02	2,357.02	2,357.02	2,757.02	2,521.15	2,521.15	2,520.58	2,520.58	2,520.58
	Tender Value	9,522,485.66	1,763,060.41	1,783,129.06	606,419.77	430,834.88	544,418.65	620,112.08	450,000.00	1,821,457.78	392,360.70	944,209.40	394,340.00	2,025,593.00	2,248,840.00
	Fraction of transaction cost to Tender Value	0.05%	0.16%	0.16%	0.45%	0.55%	0.43%	0.38%	0.52%	0.15%	0.64%	0.27%	0.64%	0.12%	0.11%

RESET

LEGAL STATUS COSTS (LS_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
PPA Contractors' Registeration Certificate	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43	21.43
Certificate of Incorporation	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78	2.78
Certificate to Commence Business														
Ministry of Water Resources, Works & Housing Classification Certificate	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86	142.86
Value Added Tax Registration Certificate														
Tax Clearance Certificate	1.00	1.00	1.00	-	-	-	-	-	-	-	-	-	-	-
Social Security and National Insurance Trust (SSNIT) Clearance Certificate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Labour Clearance Certificate	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
TOTAL LS_{TC}	238.06	238.06	238.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06	237.06

Go to Due Diligence Costs
Go to Tender Security Costs
Go To Information and Transportation Costs
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DUE DILIGENCE COSTS (DD_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Auditor's report/Financial Statement	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.00	183.00	183.00
Line of Credit	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Letter to seek Reference														
Company Profile														
TOTAL DD_{TC}	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.57	183.00	183.00	183.00

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TENDER SECURITY COSTS (TS_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Bid Bond (Insurance Company)														
OR	758	100	100	500	100	100	100	100	500	100	100	100	100	100
Bid Guarantee (Bank)														
Sealing of Power of Attorney	5	5	5	50	50	50	50	50	50	5	5	5	5	5
TOTAL TS_{TC}	758	100	100	500	100	100	100	100	500	100	100	100	100	100

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INFORMATION AND TRANSPORTATION COSTS (IT_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Communication	20	10	10	10	10	10	10	10	10	10	10	10	10	10
Transportation	1,311.00	702.24	702.24	40.28	40.28	40.28	40.28	40.28	40.28	301.42	301.42	301.42	301.42	301.42
TOTAL IT_{TC}	1,331.00	712.24	712.24	50.28	50.28	50.28	50.28	50.28	50.28	311.42	311.42	311.42	311.42	311.42

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PERSONNEL REMUNERATION COSTS (PR_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Managing Director	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
Quantity Surveyor	666.67	333.33	333.33	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
QS Assistant	303.03	303.03	303.03	454.55	454.55	454.55	454.55	454.55	454.55	437.50	437.50	437.50	437.50	437.50
Office Assistant	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33	83.33
Feeding and Snacks	312.00	156.00	156.00	78.00	78.00	78.00	78.00	78.00	78.00	93.60	93.60	93.60	93.60	93.60
Personnel to submit Tender	133.33	150.00	150.00	22.22	22.22	22.22	22.22	22.22	22.22	26.67	26.67	26.67	26.67	26.67
TOTAL PR_{TC}	1,748.36	1,275.70	1,275.70	1,388.10	1,388.10	1,388.10	1,388.10	1,388.10	1,388.10	1,391.10	1,391.10	1,391.10	1,391.10	1,391.10

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TENDER DOCUMENT COSTS (TD_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Cost of Tender Document	300	200	200	300	300	300	300	300	300	200	200	200	200	200
TOTAL TD_{TC}	300	200	200	300	300	300	300	300	300	200	200	200	200	200

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PRODUCTION AND PRINTING COSTS (PPC_{TC})

	Project A	Project B	Project C	Project D	Project E	Project F	Project G	Project H	Project I	Project J	Project K	Project L	Project M	Project N
Health and Safety Management Plan														
Environmental and Social Sustainability Plan														
Site Visit Report														
Company Profile														
Stationery and printing	66.00	66.00	66.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00
TOTAL PPC_{TC}	66.00	66.00	66.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00	98.00

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