CERTIFICATION

The undersigned certifies that has read and hereby recommends for acceptance by the Ardhi University a dissertation entitled "**Assessment of Contractors' Bidding Strategies Influence on Tender Success Rate**" in fulfilment of the requirements for the degree of MSc. in Construction Economics and Management, Ardhi University.

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DECLARATION AND COPYRIGHT

I, **Temu, Joseph J,** hereby declare that the contents of this dissertation are the result of my study and findings, and to the best of my knowledge, they have never been presented elsewhere for a Diploma, Degree, or any professional awards in any Institution of Higher Learning.

Signature……..……

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DEDICATION

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ABSTRACT

Contractors' survival in the construction industry heavily depends on the ability to secure tenders and complete projects successfully. Due to the highly competitive nature of the industry getting works requires skills, strategies, and experience. Inter alia the use of poor bidding strategies by contractors, especially small and medium-class has led most of them into an early grave. This study therefore aims at assessing bidding strategies used by building contractors to establish their relationship with tender success rate and lastly model this relationship to improve contractors bidding practices.

A descriptive cross section research design was adopted for this study where quantitative research approach was used. Questionnaires were employed to collect data about bidding strategies and tender success rate. Stratified random sampling method was used in this study, where sample size from class iv to vii building contractors where calculated to satisfy their respective strata. Descriptive analysis was used to study the nature of the data collection and address the first specific objective. Specifically mean and standard deviation were used in this analysis. Inferential analysis was adopted for second and third specific objectives where Pearson correlation was used to establish the relationship between biding strategies and tender success rate. Tender success prediction model on the other hand was developed using multiple regression analysis.

Findings have revealed the most used bidding strategies to be "Use of historic data", "Draft and Review Strategy" and "Systematic Bidding Approach", were the least used being "Aggressive strategic bidding" and "the Use of bid preparation software". Findings have further shown that the most used biding strategy have least impact on the tender success rate and vice versa. This study revealed that there is a strong positive relationship between bidding strategies and tender success rate. In particular two bidding strategies have shown a significant positive relationship with tender success rate which are Pricing strategies and Market Intelligence.

In conclusion this study has been able to develop and validate a statistically significant model for predicting tender success rate using bidding strategies as independent variables and experience as the moderator variable. The study therefore recommends that, contractors should put more emphasis on bidding strategies which has direct impact on success rate as well as seek experience to increase their chances of winning tenders.

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LIST OF ACRONYMS AND ABBREVIATIONS

ABS	Aggressive Bidding Strategy
CRB	Contractors Registration Board
FSB	Focused Strategic Bidding
GDP	Gross Domestic Product
ILO	International Labour Organisation
KMO	Kaiser-Meyer-Olkin
Max.Value	Maximum Value
MOW	Ministry of Works
MR	Multiple Regression
NBS	National Bureau of Statistics
PPRA	Public Procurement Regulatory Authority
SEM PLC	Structural Equation Modelling Partial List Square
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Science
Trans.Var	Transformed Variables
URT	United Republic of Tanzania
Var	Variables

CHAPTER ONE
INTRODUCTION

1.1 Background Information

Contractors' survival in the competitive tender market is likely to be influenced by their ability to prepare competitive bids. This is due to the reason that competitive bid is the key criterion for winning tenders in highly competitive tender market (Hanák, et al., 2021). Bidding is the process whereby service providers compete with each other by submitting priced quotations (Fango, 2019). That makes tendering an important activity in any construction company which aims at exceling in construction business. Winning tenders by contractors is becoming increasing difficult due to the competitive nature of the industry, especially to new and un-experienced firms.

The construction industry is characterized by fierce competition which aims at obtaining a competitive price for works and services offered and in turn sandwich the contractor in a complicated situation between losing the tender or dwindling the profit margins (Kimms, 2007; (Aje, et al., 2016); (Perez, et al., 2015a). This competitive nature of the construction industry has caused the mortality of many firms especially young and small ones in which according to Aje *et al* (2016) most of them fall out of business within five years of their establishment. In trying to establish factors that contribute to such failure researchers have established several causes in which one among many others is failure to secure tender in the highly competitive market (Chileshe, et al., 2020); (Alkhateeb, et al., 2020); (Gazder & Khan, 2018); (FU, et al., 2002). Winning tenders is the key aim and survival ticket for firms in the construction industry.

Studies have shown that SMEs contractors fail to secure tender from the market due to many reasons including inability to interpret construction drawings, prepare an accurate estimate, inability to tender, lack of the required skills, and failure to enter into negotiations (Lufele, 2020). These factors illustrate the poor bidding strategies used by the SMEs contractors' in the preparation of the tenders that minimize or even eliminate their chances of winning. The tendering process is an expensive undertaking to the contractors and even more so to the SMEs contractors' which puts them into a critical situation financially when they keep losing tenders (Chilipunde, 2010). Therefore Mwita (2013) suggests the need to improve the process of preparing responsive bids.

In the past decade, Tanzania has enjoyed relatively stable economic growth, the construction industry playing a vital role with a staggering growth rate of more than 7% per annum (Kikwasi & Escalante, 2018). The construction industry's contribution to the employment rate of the country grows each year making this industry to be one of the important growing industries in the country. As seen from the National Bureau of Statistics reports that the growth was from 2.1% in the year 2014 report to 2.9% in the year 2018 report. The industry contributes to more than 50% of Capital Formation, about 5% of Gross Domestic Product (GDP), and 9% of total employment in the country (ILO, 2005); (NBS, 2013). The larger proportion of the labour force employed in the construction industry is engaged in by small contractors, amounting to about 81.6% of the total labour force (NBS, 2013). Therefore improving the survival of the small class contractors can have a greater impact on the social-economic welfare of the people and the countries' economic growth at large.

Bidding strategy is the skilful organization of resources and techniques that are employed by the bidder to achieve the objective which is winning the tender and carry out the works profitably (Wibowo, et al., 2015). The first step to save firms' resources is the decision on whether to tender or not, keeping in mind tendering process has cost implications to the company's resources (Aznar, et al., 2017). This area has been well covered and a number of crucial factors which determine bid or no-bid decisions by the contractors have been identified such as project size, the financial capability of the contractor, and many others (Prajapati, Pitroda, & Bhavasar, 2015**;** Chileshe, Kavishe, & Edwards, 2020**;** Alsaedi, Assaf, Hassanain, & Abdallah, 2019)**.** After deciding to bid, then a proper bidding strategy should be adopted to increase the probability of winning the respective tender amongst competing firms (Wibowo, et al., 2015); (Perez, et al., 2014). Proper bidding strategies are crucial to ensure contractors acquire sufficient amount of works to survive in the market. Survival of these firms has impact on the economy of the country by contribution to the GDP and employment rate.

Researches have been conducted on factors affecting the bid success rate of the contractors but most of these studies have mainly focused on the pricing strategies and establishment of the bid price (Aje, et al., 2016). According to Oke, et al., (2017), several factors affect the success rate of a bid apart from price alone. Although price is given priority in the selection of the contractor, it is not the sole criteria to ensure the success of the bid (Perez, et al., 2015a); (PE REZ, et al., 2015b). Due to the importance of competitive price there is a provision in the Public Procurement Regulations (2016), clause 17 of the United Republic of Tanzania (URT)

which gives room for the rejection of the abnormally low tender. The regulation gives an alarm not to strive to lower the bid but to prepare reasonable tender price without ignoring other factors as well.

Existing researches have been conducted on the factors affecting bid or no-bid decisions in developed and developing countries as well as model development to improve contractors' winning chances. There is inadequate knowledge on the influence of contractors' bidding strategies on contractors' tender success rate. This research aims at bridging the knowledge gap by assessing the bidding strategies and their influence on tender success rate among small and medium contractors in Tanzania.

1.2 Research Gap

Several studies have been conducted on the area concerned with bidding in the competitive construction tender market. Wibowo, et al., (2015) explains the relationship between bidding strategy, project, and company performance and how they influence each other. The study found that bidding strategy has a direct influence on the project's performance but has an indirect influence on the company's performance. These relations were established using Structural Equation Modelling Partial Least Squares (SEM PLS). This study did not focus on the relationship between tendering strategies and bid success rate, rather focused on the relationship between bidding strategies and project performance as well as company performance.

A study by Vandi, (2020) has discussed bidding strategies employed by SMEs in South Africa to win construction tenders. The study was found on the theory of constraints in which the researcher stressed on the need to solve different constraints that managers of SMEs face in tendering. The strategies are employed as the solution to the constraints. The methodology deployed for this study was a qualitative multi-case study approach in which the method of data collection used was a semi-structured interview. A methodological gap was observed where the sample size used was small for any generalization as suggested by the same in the area for further study. This study used a quantitative approach to establish the relationship between variables which could not be achieved using qualitative approach.

Perez et al, (2015) developed a model to predict a future company's position in competitive tendering by studying and analysing the published dataset of tender results. This paper emphasized the use of multi-attribute apart from price alone in the selection of contractors in a

competitive market. Therefore the study brought forward the importance of the company's tender position in the analysis of the winning probability of the future tenders.

Aje *et al,* 2016 focused on factors affecting tender price in competitive bidding, arguing price determines the tender success rate. Price alone is not the determining factor of tender success as currently multi-criteria selection methods have been adopted in the evaluation of tenders. Therefore this study aims at assessing how success rate is influenced by tendering strategies covering all criteria. Some studies have explained the factors affecting bid/no-bid decisions in a construction project (Prajapati, et al., 2015)**;** (Chileshe, et al., 2020)**;** (Alsaedi, et al., 2019)**.**

1.3 Problem Statement

Small class contractors in developing countries and Tanzania, in particular, are at the risk of dying at their infant age due to many challenges scorching them. Inability to secure sufficient amount of tenders is one of the critical challenge faced by these firms in the competitive tender market. The lower tender success rate has been a contribution of using strategies that are perceived to be influential on tender success rate but rather dwindle their chances of winning tenders and hence increase their chances of being wiped out of business. Keeping in mind these contractors are the key players in the young construction industry in developing countries, and their contribution to employment in the country cannot be downplayed.

Therefore this study aims at assessing bidding strategies employed by small and medium-class contractors and how they influence the tender success rate to come up with measures to improve their bidding practices and increase their survival rate in the highly competitive tender market.

1.4 Main Objective

The main objective of this study is to assess the influence of contractors' bidding strategies on tender success rates in competitive bidding.

1.5 Specific Objectives

i. To identify major bidding strategies employed by small and medium-class contractors in competitive bidding
ii. To establish the relationship between contractors' bidding strategies and tender success rate
iii. To develop a model for predicting the impact of bidding strategies on tender success rate.

1.6 Research Questions

i. What are the major bidding strategies employed by small class contractors in competitive bidding?
ii. What is the relationship between contractors' bidding strategies and tender success rate in competitive bidding?
iii. How can contractors' bidding strategies be used to predict the tender success rate of the contractor in competitive bidding?

1.7 Significance of the Study

Small and Medium class contractors in developing countries contribute up to about 80% of all construction companies. These companies ensure the growth of the young construction industries in the country and boost the economy by their contribution to Gross Domestic Product (GDP), employment in both formal and informal sectors as well as Gross Fixed Capital Formation. The survival of these firms is of paramount importance to the growing economies, therefore this study will assist small and medium building contractors in the selection of appropriate Bidding strategies as they compete for tenders to improve their winning chances. This study will further develop a model to establish the relationship between different bidding strategies and their influence on tender success rate.

1.8 Scope and Limitation of the Study

There are two major types of ways in which a contractor can secure tender, which are through competition or negotiation. Competition is the default mode of tendering for public projects and therefore this study is restricted to the competitive tendering method of projects procurement. Furthermore, the study focuses on building contractors registered in Dar es salaam by the Contractors Registration Board in class iv-vii as they appear in the list of registration in the year 2021. This category of contractors has been selected mainly because they represent the growing companies and are most likely at the risk of falling out of Business.

1.9 Organization of the Dissertation

This dissertation contains five chapters. The first chapter provides a background of this research work. A need to undertake this research has been discussed as well as pointing out existing knowledge gap to be filled. Furthermore this chapter has discussed objectives of the study and the research questions that this study is striving to answer.

The second chapter has focused the tendering process in the construction industry pointing out different bidding strategies used in competitive bidding. This chapter further explains contractors' tender success rate in different countries as well as challenges faced by contractors in bid preparation. Lastly conceptual framework for the conceptual model is explained.

The third chapter mainly focuses on discussion of the tools, methods and techniques that were used in this study. This includes research design, selection of sample, and collection and analysis of the data collected.

The fourth chapter shows the presentation, interpretation and illustration of the data analysis of the questionnaires. As a final point to the chapter; the development and validation of the model for assessing impacts of bidding strategies on tender success rate was done using the information obtained from the analysis. Fifth chapter abridges the results of the research work and recommends areas for further research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter gives an overview of the contractors' tendering concept, contractors' tender success, and tendering strategies used by contractors. Relationships between tendering strategies and tender success rate have also been explained in this chapter. Regression model assumption, importance, and limitation have as well been explained in this chapter trying to show how it will be used in this study and lastly putting forward a conceptual model. At the end of the chapter, a conceptual framework is displayed explaining the relationships that are studied in this research.

2.2 Construction Industry Overview

The construction industry is one of fundamental economic activity and has a major role to play in the achievement of the social-economical aspect of the country. But in developing countries, the majority of construction market shares are dominated by foreign contractors and consultants; were for the case of Tanzania mainland in the 2007 it was about 70% (NBS, 2013). To reap the benefit of the growing construction industry local contractors need to be empowered to take over the large market share as in correspondence to their number. It is estimated the number of foreign contractors registered in Tanzania amounting to about 3% and execute about 96% of all contracts in Tanzania where the remaining 97% of local contractors execute only 4% of the works (Chileshe & Kikwasi, 2014). Apart from resolving the challenges identified by Kikwasi & Escalante, (2020) local contractors need to work on improving their bidding strategies to expand their market shares.

2.3 Tendering Concept: Contractors Perspective

Tendering can be defined as the process in which service providers (contractors, consultants, or suppliers) are invited by service recipients (procuring entities) to compete with each other by submitting priced quotations (Fango, 2019). Tendering can be grouped into two major categories which are competitive tendering and non-competitive tendering (Aje, et al., 2016). The later involves direct negotiation between client and contractor hence an element of competition is non-existent here; where the former is mostly opted to especially in public entities. According to Ahmed, et al., (2015); Aje, et al., (2016) competitive tendering is preferred since it fosters trust, transparency, and accountability in public procurement. On the other hand, other scholars have argued against the long used procurement system blaming it

for its inefficiencies (Hinton & Hamilton, 2015). The inefficiencies portray themselves in poor quality works, supply chain inefficiencies since the system favours the lowest evaluated bidders paying little attention to other criteria.

The main objective of tendering for the contractor is to win the job, therefore contractors adopt different combinations of strategies to achieve this goal (Oo, et al., 2012; Oke, Aigbavboa, & Ijie, 2017). Other objectives of tendering to the contractor could be to gather market information, maintaining a good relationship with the client, show they still exist in the market as well as concealing their strategies from competitors (Oo, et al., 2012). Among the existing tendering strategies, pricing strategies have been considered at the forefront in winning tenders. In recent years this has been challenged due to the use of a multi-criteria approach in the selection of contractors.

For the contractor to improve their tender hit rate there are several factors to be considered, including the selection criteria set by the client/employer. Apart from the price being the sole selection criteria in tender evaluation other criteria has been taken aboard (Fango, 2019). Selection criteria considered during tender evaluation include aspects concerned with financial matters, technical, management quality, and safety issues (Mwita, 2013); (Huang, 2011). The considerations do not only aim at obtaining the lowest-priced bidder but consider other aspects of project delivery as well. That leads to the emergence of the term lowest evaluated bidder in place of the previous term “lowest bidder” (Fango, 2019). Therefore it can be concluded that it is paramount for the contractor to align his/her tendering strategies to comply with the selection criteria given by the client.

According to Smith (1995), the bidding process can be divided into two parts which are the estimation of tender/bid price and compilation of other documents to make a bona fide tender. Estimation of the tender price should normally be carried out by the professional estimator whereas the compilation task is the management activity. In general terms, all members participating in the tender preparation process at all levels should possess relevant skills and experience to be able to make and submit a competitive tender (Vandi, 2020). Different bidding strategies will be discussed here below,

2.4 Bidding strategies

Biding strategy is a broad framework that involves the skilful allocation of resources, timing, and techniques to achieve the objective of winning tenders in a competitive market (Brook , 2008). Firms can have strategies at corporate, business, and functional levels and it is at the

functional level where tendering strategies are found (Tan, et al., 2010). According to Darbar & Pitroda, (2018) different factors affect the selection of bidding strategy which are; project size, equipment availability, number and capabilities of firm's personnel, profitability (profit potential), and labour availability. At the end of time selection of the strategies, the combination of the strategies and their implementation depends on the experience of the manager. Later in this chapter different bidding strategies will be discussed in detail.

2.4.1 Pricing strategies

In bidding, pricing is one of the most important factors that influence the tender winning chances. A study by Oo, et al., 2012 showed that there is a positive relationship between the bid price and tender success rate. Therefore it is important to make a detailed study and determine the most crucial pricing strategies adopted by construction companies in bidding for construction works. (Akintoye & Skitmore, 1990) Pointed out six strategies that can be used in pricing which are; cost-based strategy, market-based strategy, standard rate table strategy based strategy, Historical price based strategy, sub-contractors bid base, and cover prices. On the other hand, Mochtar and Arditi, (2001) explained that in the construction industry there are two major pricing strategies, and all the others fall in between the two strategies which are cost-based and market-based. They further explain that the cost-based approach is the most widely used in pricing in which they argue to be the wrong approach. Propose to use the hybrid approach which incorporates features of both cost-based and market-based approaches.

According to (Hanák, et al., 2021) contractors tend to mostly use three pricing strategies which are cost-oriented, demand-oriented, and competition-oriented. Research done in the Czech Republic shows that 59% used cost-oriented, 21% demand-oriented, and 14% used competition-based price.

The pricing strategies have also been explained from a different approach depending on the objective of the company at the time of tendering. The two strategies namely Skimming and Penetration pricing strategies adopt bidding relatively higher price than a market can offer and bidding lower price respectively (Mochtar & Arditi, 2001). With a skimming strategy, the bidder has a competitive advantage in the market and therefore aims at quick capital recovery. Whereas Penetration strategy as the name suggests seeks to penetrate a new market or try to survive during bad times by bidding lower enough to break even or even make small losses.

Another strategy used in pricing for tendering is by assigning different mark-ups to different work items of the bills of quantities commonly known as individual rate loading (Hanák, et al., 2021). This strategy is also known as unbalanced bidding and can as well adopt frond/end loading and/or back/end loading techniques (Aziz & Aboelmagd , 2019). The study by (Stark, 1968) Shows that this strategy does not end in tendering alone but as well helps the contractors cash flow during the execution of the project. This technique can increase bid award chances since it guarantees low total cost and risk consideration for each item (Aziz & Aboelmagd , 2019).

2.4.2 Focused Strategic Bidding

Depending on the situation of the company and market bidders may bid for the specific type of works or may decide to bid blindly for whatever work that comes their way. Having criteria for the selection of works to bid for has been advocated by many researchers and this is what is referred to as a focused strategic bid (Vandi, 2020). The study by Hanák, et al., (2021) indicated that participating in many tendering does not guarantee an increased tender success rate rather leads to an increased cost of tendering to the company. Bidding decision should be the first thing to consider before the process of tender preparation could be carried on (Chileshe, et al., 2020), (Prajapati, et al., 2015). In most cases, un-strategic bidding is caused by high competition in the market or when the company tries to survive during a bad economic period.

2.4.3 Use of historic data

In the tendering process, historic data is of uttermost importance. These data according to Prajapati et *al*, (2015) can be used to improve the current and future bid by supplementing the missing and likely information of the present bid. These data also form part of bid submission especially on the experience of the past project. The importance of highlighting past projects lies in the confidence built to the client based on how past projects were performed, the nature of the projects as well as the contract performance (Vandi, 2020). Keeping the bidding history also helps in establishing and tracking the company's success rate. The success rate and history can be used to the advantage of the company by improving the current bid.

2.4.4 Specialization

Specialization has been mentioned as one of the strategies that SMEs can adopt to have a niche in the competitive tender market. According to Vandi (2020), specialization can be

viewed from two different perspectives. The first angle is where small firms need to specialize and master certain types of work which will give them a competitive advantage over the unspecialized contractors. On the other perspective is when the small firms should either have managers with specialization in construction tenders preparation or hire a specialized person to undertake the tendering process. Most construction companies have a shortage of specialized personnel in tender preparation (Hanák, et al., 2021). This could be one of the causes that lead to a low success rate among contractors in Construction companies.

In markets for highly specialized works contractors tend to know each other because they are just a handful which influences them to have a highly competitive price (Hanák, et al., 2021). The researcher also pointed out that large companies have some sort of specialization in their systems which allow them to increase their quality of work and eventually increase the success rate.

2.4.5 Draft and review strategy

To prepare a competitive bid the document needs to be very accurate, free from errors as much as possible. According to Grayson, (2020) proofreading the prepared tender document before it is submitted is one of the ways that could be used to minimize errors in the documents. The study further explained that the best technique to achieve this is to follow what is known as the "overnight test", where the team responsible for the preparation of the tender can take a rest and go through the document tomorrow with a fresh mind. Several drafts of the tender document should be prepared and reviewed with a fresh eye (Tender Training College, 2020). This will eventually increase the chances of winning in a competitive tender. The study conducted in the Czech Republic showed that about 78% of the contractors perform document checks before submission but the rest do not due to time pressures (Hanák, et al., 2021). The researcher further indicated that the quality of tender documents is the condition that influences success; therefore contractors have to make sure they produce the quality tender document. Contractors should check the correctness of design documents and bills of quantities before the preparation of the bid (Hanák, et al., 2021). Contractors cannot rely on the quantities established by the client due to a lot of in accuracy that come with it (Varma, et al., 2016).

2.4.6 Market Intelligence

Tendering for construction works is more likely to be successful if market analysis at the time of tender is given ample consideration (Vandi, 2020). It is advised to be mindful of the market condition when preparing bids for submission. This strategy involves probing into the market to have detailed information about, what are the project objectives, who is the client and what are their core drivers and concerns, what influences the market, and who else is bidding for this project. With enough market information, the contractor can be able to make a set of decisions that will improve the success rate.

Marketing intelligence is also important in tender pricing; it involves seeking/collecting data from the market to be able to provide an adequate understanding of the current condition. With enough market intelligence, the bidder can be able to maximize profit by bidding higher than cost + mark-up or increasing the winning chances by lowering the tender price to reflect the marketing condition. Marketing intelligence can also be an effective tool for deciding whether to bid for the project or not to bid. With enough market, information contractors can use competitive pricing especially when the contractor knows their competitors (Hanák, et al., 2021). This is mostly used for highly specialized works in which contractors know each other.

2.4.7 Aggressive bidding strategy

Due to stiff competition in the bid market, tenderers may opt to tender very low to enable them to win the tender with either a low-profit margin or small losses (Vandi, 2020). The main aim of this strategy is to allow the firm to survive a bad period where the firm has no work or is trying to penetrate a new market. According to De Silv a, et al, (2003), firms tend to bid very aggressively when they encounter a strong rival in bidding and less aggressive when weak rival is encountered. They also point out those aggressive bidders normally wins tenders with a very low margin of profit as compared to when bid was not aggressive. Under-pricing for the sake of winning the tender comes with the potential winner's curses to the winning contractor. The winners curse can be compounded in the situation where under-priced quotations from the subcontractors have been included in the final bid (Ahmed, et al., 2015). Further study can be undertaken to assess the impact of winners' curses on small class contractors in Tanzania.

2.4.8 Use of bid preparation software

Technology takes a toll on all the business that has refused to change and adapt with the current trend of science and technology. There are many tender preparation software available

ranging from the ones that assist in decision making to the ones assisting in setting bid mark-up and tender compilation (Fayek, 1998). Vandi, (2020): Apostolou & Mentzas, (2003) in their studies propose an easy way to save cost and time in bid preparation is to lean towards technology, be it word processor or estimation software. Apart from time and cost-saving the use of software in combination with the competent manager results in the production of a professional-looking document that is error-free (Vandi, 2020). Bid preparation software also helps to centralize and coordinate the bid preparation process to facilitate easy collaboration among team members, all, in turn, keeps the bid process under control and improves bid success rate (Apostolou & Mentzas, 2003). There are different bidding preparation software each with its benefit but they all share the common fundamentals which are; acting as the database for cost, the ability to prepare multiple estimating reports, tracking bidding history, recalling and modifying past projects and job costing. Therefore it can be hypothesized the more use of this strategy could result in an improved tender hit rate.

2.4.9 Teaming up with established business

Most of the SMEs lack enough experience and exposure to the construction market and clients. Teaming up with experienced contractors/firms in tendering offers an additional advantage to the firm both in terms of growth and tender winning chances (Vandi, 2020). There are several forms in which firms can team up to share experience and complement each other's weaknesses in bidding for construction works. Tan et al, (2010) pointed out that contractors can team up in form of a joint venture, strategic alliance, partnership, and consortia, depending on the agreement and nature of the union determined. Teaming up came up as one of the most used and effective strategy in winning bids according to the study conducted by (Tan, et al., 2010). Group bidding has also improved from involving bid team members from departments of the same company to include members from different companies in a manner such as joint venture (Yan, et al., 2018). This leads to teaming up with several construction companies to bid for building works.

2.9.10 Systematic Bidding Approach Strategy

To increase the chances of winning any particular tender, a systematic tendering procedure that involves planning needs to be adopted (Vandi, 2020). When the procedure has been used for a long time and has undergone streamlining ensure preparation of the competent bid. According to Urquhart (2017), internal tender procedures need to be established and followed to govern the tendering obligations. Several frameworks have been set out for use with

several steps to follow but cover from the decision to bid all the way to contract signing. The researcher suggested more studies should be undertaken to compare which tendering framework is more effective in tendering processes.

2.5 Contractors' Tender Success

To win tenders many success criteria must be considered. In previous years selection criteria were solely price-centred, but in recent years a multi-criteria approach has been adopted in the selection of contractors. Therefore all the criteria need to be considered by the firm to increase the winning chances. According to Brook (2008), some of these criteria include; price, time, pricing strategy, method statement, safety and quality, the composition of the construction team, and presentation of the bid. These selection criteria are unique to each project and client, therefore there is a need to have a detailed study on the selection criteria and determine how they can be achieved in the best way. According to Public Procurement Act (2013) and Public Procurement Regulations (2016) directs the Procuring Entities to include selection criteria in the solicitation documents.

Tender success can be measured by the bid hit ratio which is the total number of attempted bids divide by the total number of successful bids (Alkhateeb, et al., 2020). Alkhateeb et al, (2020) explained that hit ratio of 100% (1:1) is the perfect ratio but its achievement is nearly impossible, whereas 25% (4:1) and above is considered excellent, 10% (10:1) is considered a good performance but 2.90% (35:1) and below is considered very poor bid success rate. These categories will be used in this study to rank the success rate of contractors in bidding for building works.

A study conducted by (Hanák, et al., 2021) in the Czech republic found out that about 48% of 70 companies had a tender success rate below 20%, 24% of the companies had a tender success rate ranging between 20% - 40% and 28% of the companies had a success rate above 40%. A similar study conducted by (Alkhateeb, et al., 2020) in Jordan found out that 75% of companies had a success rate below 20%. The study from the two countries displays a different success rate for contractors indicating a change of the context affects the success rate of contractors.

On the other hand, there is a contradiction in the influence of experience on the tender success rate of the contractor. According to Alkhateeb et al 2020 contractors, experience does not influence the tender success rate. While other researchers argue that experience could have a positive effect on the tender success rate, advocating for the strategy of SMEs to team up with

experienced firms to leverage their experience in tendering (Vandi, 2020). Another issue with contraction as far as experience is concerned for this case is the measure of experience of the contractor. According to Banki (2009) contractors, experience is attained with an increased number of bidding done during the lifetime of the company whereas to others they measure through the number of years or class of contractor. Therefore for the case of Banki (2009) experience is not measured by the number of years but rather the number of projects tendered for, the larger the number of projects the higher the experience of the firm and vice versa.

2.6 Challenges Faced in Bid Preparation

There are various challenges faced by contractors in the preparation of responsive tenders. According to Fango, (2019) challenges faced by contractors in bid preparations include stiff competition, presence of foreign companies, inadequate approach, insufficient knowledge and experience to prepare a responsive bid, lack of experience, inability to meet turnover required, and inadequate technical and managerial capability. All the challenges can be grouped into three major categories which are competition, technical capability, and inability to meet selection criteria.

Thwala & Mvubu, (2009) identified additional challenges that specifically face small and medium-size contractors in the bid preparation process. These challenges include; lack of resources, inability to raise securities, inadequate technical and managerial capability, and lack of experience. Thwala & Mvubu, (2009) introduced the issues of lack of financial resources required in bid preparation as one of the challenges facing small and medium-class contractors.

Xueyong in his study in 2009 tried to identify challenges faced by small and medium contractors in Tanzania, all falling into financial, managerial, and technical capabilities challenges. Mwita (2013) also pointed out major challenges faced by Tanzanian local contractors in bid preparation to be the inability to provide securities, stiff competition, inadequate access to credit, high financing costs, and failure to meet turnover.

It can be seen from different researches that small and medium-class contractors are faced with financial, managerial, and technical constraints while preparing tenders in competitive bidding. According to (Vandi, 2020) it is by finding solutions to these challenges that will enable these firms to grow and secure more jobs. Therefore small and medium construction firms should devise a mechanism to improve their tendering strategies by solving these constraints.

2.7 Biding Models

2.7.1 Regression

The concept of the model has best been explained by Pankratz, (1991) as a useful way to express time structured relationships between variables and use of such time structured relationships in the prediction of future occurrences. Such a relationship is possible because events occurring at one particular time have a certain relationship with events occurring at other times. In this study regression model will be used as a tool to predict the tender success rate using tendering strategies as independent variables and correlation will be used to establish the relationship between tendering strategies and tender success rate.

The regression model is concerned with using the existing relationship in which the values of dependent variables can be predicted using values of independent variables (Ainur & Marioara, 2002). Regression analysis operates under the given sets of assumptions as will be indicated below. Observation of these assumptions is paramount since their violation leads to the establishment of a biased relationship between variables (Williams, et al., 2013).

i. Output (dependant variables) is influenced by the input (independent variables), whereas vice versa is not true. (feedback)
ii. There will be a disturbance in the model because movements of the independent variables will not cause movement to the dependent variables by a hundred percent. Therefore the remaining percent will be caused by factors other than independent variables.
iii. There should be no autocorrelation between the values of the dependant variables
iv. The relationship between variables can be represented in a linear model. Non-linear relationship if overlooked can cause the possibility of committing either type I error or type II error that is underestimation or overestimation of the true relationship (Osborne & Waters , 2002). There are several ways to check for linearity of the relationship but the best advocate is to analyze the scatter diagram and determine the nature of the relationship.
v. Dependent variables are continuous random variables and when not in this form they should allow transformation to adhere to this assumption. The dependent variable in this study is in continuous random variable therefore well observing this variable (tender success rate which is a ratio between won projects and tendered projects)

vi. Multiple regressions assume that variables are normally distributed. Data with high kurtosis or skewness values tend to affect the relationship that will be established as well as the significant tests (Osborne & Waters , 2002). Outliers have to be identified and managed as the process of data cleaning. Although Williams, et al., (2013) argues that the normality assumption is more relevant to the distribution of the errors than to the variables themselves. The study further argues that regression is robust to this assumption since as sample size increases this problem becomes automatically corrected and thus establishing unbiased results.

vii. It is also assumed that variables should be measured without error (that is they should be reliable. Reliability can be measured using the Cronbach alphas test, where it is indicated values from 7.0 and above are satisfactory to ensure reliability (Pallant, 2007); (Osborne & Waters , 2002).

viii. Homoscedasticity assumption; assumes that variance of the error is the same at all levels of predictor variables and it is also known as homogeneity of variance assumption (Osborne & Waters , 2002). In the case where the variance of error encounters heteroscedasticity, several measures have been suggested including robust estimation method for standard error, bootstrap method, or estimation via weighted least squares (Williams, et al., 2013).

Another common issue in regression analysis is the problem of multicollinearity. Multicollinearity occurs when there is a strong relationship among the values of independent variables. According to Luvara, (2020) the values of correlation exceeding 0.85 indicate a serious problem of multicollinearity among the latent variables. In regression, the aim of analysis will determine the severity of the multicollinearity problem, for prediction purposes it does not have serious harmful effects (Williams, et al., 2013). Although there are ways suggested to deal with the problem of multicollinearity some of which including eliminating one of the strong correlated independent variables, use of principle component regression, or the use of an alternative estimation method (Ainur & Marioara, 2002; Williams, Grajales, & Kurkiewicz , 2013).

Multiple regression models have been selected for this study due to their inherent benefit for the study at hand. MR can work best with either categorical independent variables, continuous independent variables, or both (Keith, 2019). This study has categorical independent variables and continuous dependent variables making MR the best model to express this relationship.

Conforming to its name MR can make use of multiple independent variables to explain the variations in the dependent variable. The study at hand has multiple strategies that try to establish their predictive power to the dependent variable, therefore making MR the best choice to establish this relationship. Last but not least MR can be used for both experimental and non-experimental research where other methods such as Anova cannot perform both (Keith, 2019). This research is non-experimental explaining the real situation happening on the ground making MR the best candidate.

2.7.2 Correlation

Several statistical tests are used in measuring associations between different variables. The nature of variables to be measured and the intended results are the key for the selection of a certain type of test statistic. The commonly used statistical measure for measuring relationships are the spearman ranking correlation and Pearson correlation where the former is a non-parametric measure where the later is a parametric measure (Marshall, n.d). Pearson correlation is a commonly used statistical measure in establishing the relationship between two or more variables.

Table 2. 1 Strength of Correlation Coefficient

Correlation Coefficient		(Dancey & Reidy, 2007)	(Akoglu, 2018)	(Chan , 2003)	(Marshall, n.d)
0	0	Zero	Non	Non	Non
+0.1	-0.1	Weak	Negligible	Poor	Weak
+0.2	-0.2	Weak	Weak	Poor	Weak
+0.3	-0.3	Weak	Moderate	Fair	Weak
+0.4	-0.4	Moderate	Strong	Fair	Moderate
+0.5	-0.5	Moderate	Strong	Fair	Moderate
+0.6	-0.6	Moderate	Strong	Moderate	Strong
+0.7	-0.7	Strong	Very Strong	Moderate	Strong
+0.8	-0.8	Strong	Very Strong	Very Strong	Strong
+0.9	-0.9	Strong	Very Strong	Very Strong	Very Strong
+1	-1	Perfect	Perfect	Perfect	Very Strong

The measure of the relationship between variables is denoted by the letter "r" with the values ranging between -1 to +1 and where zero indicates no relationship (Akoglu, 2018). Interpretation of the strength of relationships differs from one researcher to the other as summarized in Table 2.1 above. The correlation coefficient anywhere between +/- 0.2 to +/- 1.0 indicates the existence of the relationship between the variables. Positive values correlation coefficient indicates that an increase in value of one variable is related to the increase in the values of other variables and negative values signify the vice versa.

Pearson correlation has been selected to be used to study the relationship between bidding strategies and the tender success rate of the building contractors. Pearson correlation is governed by a set of assumption being a parametric test statistics, according to (Schober, et al., 2018) these assumptions includes; First data should be randomly selected and should be a representative of the population and the second assumption is both variables should be continuous variables and conform to the test of normality. The dependant variable in this research is continuous data and independent variables have been transformed to conform to these assumptions.

2.8 Conceptual Framework

A conceptual framework is a system of concepts, assumptions, expectations, and beliefs graphically presented to explain relationships that is ought to be studied (Tamene, 2016). It is a tentative theory that guides the research. From the literature reviewed it was found that there is a link between contractors' tender success rate and the tendering strategies adopted by contractors in competitive tendering. A study by Tan, Shen, & Langston, (2010) indicates that although no one particular strategy can be credited for the success of contractors in bidding but a good strategy can enable proper utilization of firms' competitive advantage. This study aims at statistically testing the existence of the relationship portrayed in Figure 2.1

Studies have also suggested there is a relationship between experience and companies competitiveness in tendering. A study by Fu, Drew, & Lo, (2002) indicates that contractors bidding performance improves as contractors bids for more projects. They show that number of projects won is likely to increase as the number of projects tendered for increases. Although some of the researchers urge that experience does not influence tender success rate (Alkhateeb, et al., 2020). Alkhateeb, et al., argues that increase in the number of projects tendered for does not guarantee an increased number projects won.

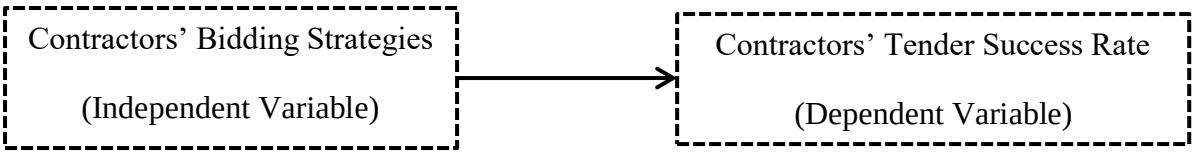

Figure 2. 1 Conceptual Framework

Figure 2.1 portrays the relationship between bidding strategies and tender success rate. Contractor's tender success rate can be due to the use of a certain bidding strategy or a combination of several bidding strategies. This framework shows a direct uninterrupted

relationship between the two variables, although some studies have pointed out a number of moderator variables. Experience has been mentioned as one of the major moderating variable into this relationship. Therefore this study aims at studying the relationship between tendering strategies and tender success rate with experience as a moderator variable.

2.9 Chapter Summary

This chapter has expounded the concept of contractors' bidding strategies as well as contractors' tender success rate in different countries. Further the chapter has explained challenges faced by contractors and bidding model that can be adapted to link between tender success rate and contractor's bidding strategies. The coming chapter aims at explaining the research methodology.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the methodology adopted in conducting this research. It has discussed the research design, research approach, sample selection, and methods of data collection. It has explained what has been selected, how it has performed the required research purpose but most important why has it been selected.

3.2 Research Design

Research design is a plan and procedure undertaken by the researcher to determine the methods for data collection, analysis, and presentation in a manner that makes sense to the researcher and the third party as well (Creswell, 2009). According to Kothari (2014) research design provides a systematic blueprint for the collection, measurement, and analysis of data. Research design covers what the researcher will do from the formulation of hypothesis up to analysis of data as well as how findings will be presented. To achieve the aim of this study descriptive research design with cross sectional features has been adapted. According to Akhtar & Islamia, (2016) this type of research design is used to study current situation. The research design for this study is divided into five main stages from the start to completion as illustrated in figure 3.1.

Stage one; is mainly to firmly establish the background through a detailed study of the literature and review to be able to clearly define the problem, formulating firm study objectives and gap identification. At this stage, an intensive study on the field covering the bidding process, bid success prediction, and measure of success rate in bidding for construction was conducted. The research problem was discussed and firmly anchored using the works of literature available on the theories and tender success prediction models. Research objectives were also clearly identified and refined to be able to address the explained research problem and come up with a solution.

Stage two; in this stage questionnaire survey pilot study was conducted to test the reliability of this tool during data collection. All shortcomings identified during the pilot study were addressed and produce a reliable questionnaire to assist in data collection. Purposive sampling was used to select contractors to administer questionnaires for the pilot study as used in the study by Kavishe (2017). Data obtained during the pilot study assisted in the formulation of

the initial conceptual model for the prediction of tender success rate using tendering strategies as causal variables.

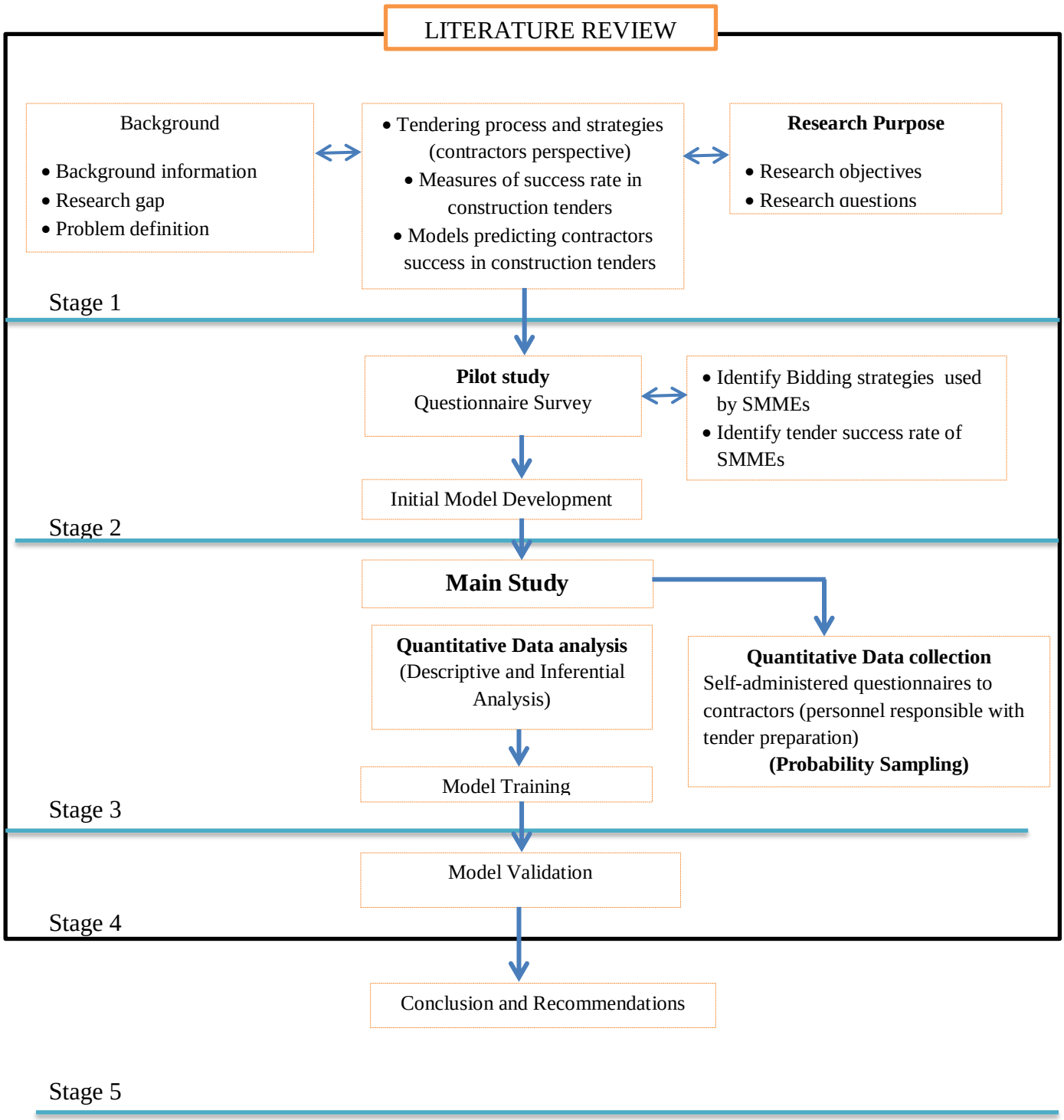

Figure 3. 1 Research Design

Stage three; this stage covered all matters pertaining to data collection, analysis, and prediction model development. Quantitative data was collected by employing questionnaire surveys method of data collection. Refined questionnaires were sent to the selected contractors through emails, postal address, physical handover, and through online

questionnaire means (google forms). The collected data will be analysed using descriptive and inferential analysis.

Stage Four; was basically for model validation, conclusion and recommendation. Split sample validation method was used due to limited time available to collect new data for validation. Sample of collected data was split into two groups, training sample and validation sample in 70%-30% ratio respectively. The validation process was used to check the validity of mathematical and physical assumptions used in developing the model and estimating the coefficient (Snee, 1977) as well as reliability of the model in prediction. Lastly the analysis obtained was used to draw conclusion and recommend the best tendering strategies that SMEs should use to improve their tendering practices.

Stage Five; was basically for conclusion, and recommendations. The analysis obtained was used to draw a conclusion and recommend the best tendering strategies that SMEs contractors should use to improve their tendering practices

3.3 Research Approach

This study has made use of a quantitative research approach, where quantitative methods of data collection were used. This approach was opted for since the main focus of this research is on establishment of quantitative relationship between tender success rate and bidding strategies as well as models this relationship for prediction purpose. Khalid, et al, (2012) pointed some of the conditions for use of quantitative approach such as prediction of phenomenon, use of probability sampling and use of larger samples. Data was collected separately using a questionnaire survey. Then a quantitative analysis of data was then used to establish the relationship between tendering strategies and contractors' tender success rate.

3.4 Population of the Study

The selected population for this study was local building contractors from classes four to seven located in Dar es Salaam, registered by the Contractors Registration Board (CRB). The total number of these contractors as according to the CRB list of 2021 was 73 for class four, 152 for class five, 119 for class six, and 113 for class seven making a total of 457 contractors considered for this study.

Building contractors registered in Dar es Salaam have been selected for the study because most of the building contractors operate from Dar es Salaam. More than 20% of all building contractors are situated in Dar es Salaam City making it a proper location to conduct the study. The population of contractors from class iv to vii have been selected for the study because according to Aje et al (2016), these contractors are still growing and at the risk of dying due to lack of sufficient amount of tenders.

3.5 Sampling Design

Sampling design can be referred to as the plan and methods to be adopted by the researcher in the selection of units for the sample. It also includes all the calculations for the computation and estimation of the sample statistics from the target population (Kabir, 2016). Before data collection is undertaken sampling design needs to be established.

3.5.1 Sampling Technique

Sampling techniques can be broadly divided into two main categories which are probability sampling and non-probability sampling (Kabir, 2016). In probability sampling, each individual in the population has equal and positive chances to be selected for the study whereas for non-probability sampling some elements of the population do not have chances to be selected.

In the probability sampling technique there are several sampling procedures including; simple random sampling, systematic random sampling, stratified random sampling, and clustered random sampling (Kothari, 2014). This study employed the use of stratified random sampling in which contractor classes were regarded as strata (Class iv-vii) and the sample was selected randomly from each class. Strata size was established as the proportionate size of the total sample size.

3.5.2 Sample Size

There are various formulas given for the establishment of sample size for infinite or finite population size. The target population size studied in this research is known, as established from the Contractor's Registration Board (2021) website. Therefore, the formula for sample calculation is as given below by (Kabir, 2016).

$$\mathrm{n} = \frac{Z^2 P.q.N}{e^2.(N-1) + Z^2.P.q}$$

Where; n= proposed sample size Z= stands for confidence level (Z= 95%) P= degree of variability (P=50%) q= 1-P 8 e= acceptable of error (e=5%) N= population size

1.11.1 Contractors' Sample Size

$$n = \frac{(1.960)^2(0.5).(1-0.5).(457)}{(0.05)^2.(457-1)+(1.960)^2.(0.5).(1-0.5)}$$

n = 209

Table 3. 1 Stratified Sample

Contractor Class	Calculation (Nh / N) x n	Sample Size
Class 4	(73 / 457) x 209	33
Class 5	(152 / 457) x 209	70
Class 6	(119 / 457) x 209	54
Class 7	(113 / 457) x 209	52
	Total	**209**

The total sample size for contractors is 33 numbers for class four, 70 for class five, 54 for class six, and 52 for class seven, where the four classes were used as strata. Strata sample sizes are determined by the following equation. nh = (Nh / N) * n. Where nh is the sample size for stratum h, Nh is the population size for stratum h, N is the total population size, and n is the total sample size.

3.6 Unit of Analysis

The term unit of analysis can simply be defined as the entity that is being analyzed in scientific research (Dolma, 2010). The unit of analysis for this research were the building contractors from class iv to class v registered by Contractors Registration Board (CRB), located in Dar es Salaam. One contractor represents one unit since the tendering process is a specialized process and is conducted by a specific department, person, or team depending on the setup of the company.

3.7 Data Collection

This section explains the instrument that was used in primary data collection and measurement of study variables. The study adopted a quantitative approach which was also reflected in the methods of data collection. Data collection is the core of research study, selecting a proper instrument of data collection is of vital importance to be able to correctly address the research objectives (Kabir, 2016). To select the best method of data collection one must know what kind of data is targeting to collect as well as who are the respondents. There

are two types of data which are primary data and secondary data. Secondary data was obtained through literature review whereas primary data was collected through the use questionnaires.

3.7.1 Questionnaire Survey

The questionnaire is the most widely used tool of data collection in which a series of composed questions are sent to the desired sample for response (Pandey & Pandey, 2015). This method of data collection was selected because of the advantages it portrays in data collection for large samples, which are; first it is cheap in terms of cost, a large number of respondents can be accessed in a short time, covers wide research area as well as reliability in cases where the researcher cannot contact all respondents in person.

Well-prepared questionnaires were administered to the selected contractors using either of the three ways depending on the availability of the respondents; one was a face-to-face questionnaire, printed questionnaires, and online questionnaires on survey forms. All costs of administering questionnaires were covered by the researcher. Ethical consideration was adhered to throughout the process of data collection.

3.8 Data Analysis

Data analysis is the vital stage of conduction research because it is at this stage that data and figures collected from the field and other researches are put to solve research problems (Ashirwadam , 2018). Data analysis involves studying the data from different angles to discover new facts (Pandey & Pandey, 2015). Both descriptive and inferential analyses were used in this study.

3.8.1 Descriptive Analysis

Descriptive statistics is the summarization of data to describe what happened in the sample. This statistic further helps to describe different characteristics of data obtained in the field to guide the summarization and generalization of concepts (Thompson, 2009). Descriptive statistics were used to establish the frequency of usage of tendering strategies (independent variables), establishing the percentage distribution of tender success and tender failures among the collected data while mean and standard deviation were used to rank the bidding strategies. Descriptive statistics were mainly used in the analysis of the first specific objective.

3.8.2 Inferential Analysis

Inferential analysis followed after descriptive data analysis. Inferential analysis generally allows the researcher to use information from the sample to make generalizations of the population that was studied (Thompson, 2009). This analysis was useful in testing the relationship between bidding strategies and the tender success rate of the building contractors.

The study through theoretical backing has established different tendering strategies and other factors that influence contractors' tender success rate. Tendering strategies are the independent variables; the success rate is the dependent variable. Due to the nature of this study Pearson correlation analysis (Zhang, et al., 2018) was used in establishing the relationship between tendering strategies and tender success rate whereas predictive statistical multiple regression analysis was used to model the relationship. In the analysis of multiple regressions, key parameters that were checked for the validity of the model are; sample size validity, multicollinearity, outliers, linearity, normality, and singularity (Pallant, 2007).

In using regression analysis sample size is of uttermost importance; small samples are problematic during analysis. The formula was devised to check for the adequacy of the sample size. The formula relates the number of independent variables to be tested and the minimum sample to be used, which goes by $N \geq 50+8m$, where m is the number of independent variables and N being the sample size (Pallant, 2007). The allowable sample size according to the formula given with 9 being the number of independent latent variables should not be less than 122. Sample size for this study was 209 and returned questionnaires were 131, therefore sample size was adequate to allow conclusive analysis.

Multicollinearity happens when independent variables are highly correlated whereas singularity is when an independent variable is a combination of a couple of other independent variables. These affect regression modelling and were checked to have a reliable model. The allowable range of multicollinearity is the value of $r \geq 0.7$ (Pallant, 2007). But for prediction purposes, multicollinearity does not have any harmful effect on the relationship (Williams, et al., 2013).

On the other hand, outliers express the extreme residual values of the prediction model. For the model to have high prediction power residuals need to have a normal distribution with the predicted score as well as need to have a linear relationship with the predicted scores. Residuals should be contained between values not exceeding 3.3 and not below -3.3.

The software package that was used to perform the analysis was the IBM SPSS Statistics V25 2019. The software was selected due to its statistical ability to perform multiple regressions and correlation analysis as well as its friendly user interface.

3.9 Study Variables and Measurement

This study has ordinal independent variables and a single continuous dependant variable. The independent variables constitute the tendering strategies. These are the latent variables that are further explained by observed variables which help to measure the influence of each strategy on tender success rate. The dependant variable for this case is continuous. And finally, we have the moderating variables which are factors affecting tender success rate apart from tendering strategies.

3.10 Conceptual Models Formulation

Multiple regression equation was used to model the relationship between bidding strategies and tender success rate. This model explains the prediction of the situation when there is more than one independent variable used to explain variations to the dependent variable. Multiple regression models have been explained in detail in chapter two, pointing out the assumptions, strengths, and weaknesses. Therefore the conceptual model is given below;

3.10.1 Multiple Regression Model

$Y = \beta_0 + \beta_1 \mathrm{X1} + \beta_2 \mathrm{X2} + \beta_3 \mathrm{X3} \ldots\ldots\ldots + \beta_{10} \mathrm{X9} + \varepsilon$

In the equation above "Y" is the dependant variable which is contractors' tender success rate. The tenders success rate in this equation is given as a continuous variable where it is measured as the ratio of the number of projects won the number of projects tendered by the contractor (projects won/projects tendered) in competitive bidding. "β_0" is the term expressing population intercept; it the term of success rate when all other factors in the equation are kept at constant. "$\beta_1 - \beta_{10}$" are the slopes coefficient of the tendering strategies; they determine the strength of influence of each strategy to the dependant variable. "X1 – X9" are the terms representing dependent variables that are tendering strategies in our study. Finally "ε" is the term representing disturbance; this is because changes in the independent variables cannot fully explain changes in the dependent variables. Therefore the disturbance represents all other factors that have an impact on the dependent variable but are not explained in this model.

3.11 Ethical consideration

The main aim of academic research is to generate and contribute to the body of knowledge. This knowledge makes an impact when it reaches the recipients/audience; the research audience is reached through publications and therefore all academic researchers should adhere to the right behaviour in communicating the research findings (Blumberg, et al., 2005). According to a study conducted on research ethics by Akaranga & Makau (2016); this study has considered ethics in the following areas;

Throughout the writing of this dissertation report, plagiarism was avoided, the contribution of each scholar in writing this research was appreciated and recognized through proper citation and referencing. On data collection, respondents had voluntary and informed consent to participate in the study but also anonymity, the confidentiality of information, and privacy of respondents were protected. Names of the respondents and the company were not displayed because publishing the company's success rate data and strategies can be used with competitors to their advantage. Also an introduction letter from the university was acquired and used by the researcher in the process of data collection.

No form of payment or compensation was offered to the respondents with the aim of persuasion or influencing the response. Lastly, data collection was not fabricated but collected from the respondents using the tools of data collection stipulated in this methodology. Data was collected from the respondents and analyzed objectively to present findings in a manner depicting the actual situation on the ground.

3.12 Chapter Summary

This chapter has explained in detail the methodology that was used in conducting the study. Methods of sample selection, data collection, and analysis have been explained in detail considering the what, how, and why rule in selection. Furthermore, conceptual models to aid in explaining the relationship between the two variables have been developed. Information presented in this chapter will be used as the blueprint throughout the remaining part of this research work to provide guidance and direction to the researcher.

CHAPTER FOUR
DATA FINDINGS, ANALYSIS, AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter covers the presentation of the data collected and a thorough discussion of the research findings. The chapter first presents the characteristics of the sample used to collect the data and before embarking into detailed analysis different statistical tests and data transformations were conducted. These tests include a reliability test, a test of normality, and a test for multicollinearity, where the type of data transformation performed was the square root transformation. Analysis of each specific objective followed and model development for predicting contractors' success rate with the use of tendering strategies as predicting variables.

4.2 Sample characteristics

A total of 209 questionnaires were distributed to building contractors from class IV to VII located in Dar es Salaam. A total of 131 questionnaires were returned marking an overall return rate of 63% which is sufficient enough to warrant proceeding with statistical analysis. The response rate by contractors is as seen in Table 4.1.

Table 4. 1 Sample Characteristics

Class of Building Contractors	Questionnaires Distributed	Questionnaires Returned	Percentage of Questionnaires Returned
Class 4	33	31	94%
Class 5	70	35	50%
Class 6	54	32	59%
Class 7	52	33	63%
Total	**209**	**131**	**63%**

4.3 Profile of Respondents

As indicated in Table 4.2 respondents were assessed on the four variables namely Company experience, Personal experience, Position on the firm, and Education qualification. On position held in the firm majority of the respondents were Quantity Surveyors (67.7%) followed by engineers (26.2%). Bidding in the Tanzanian construction industry is by large part undertaken by quantity surveyors and assisted by other professionals especially the service engineers in preparation and pricing of service works documents. Therefore this could be the reason why most of the respondents are quantity surveyors followed by engineers.

Table 4. 2 Profile of Respondents

Variable	Category	Frequency	Percentage
Company Experience	1-5 Years	88	67.2
	6-10 Years	31	23.7
	Over 10 Years	12	9.2
	Total	**131**	**100.0**
Personal Experience	1-5 Years	107	81.7
	6-10 Years	22	16.8
	Over 10 Years	2	1.5
	Total	**131**	**100.0**
Position in the Firm	Quantity Surveyor	88	67.7
	Architect	4	3.1
	Engineer	34	26.2
	Project Managers	3	2.3
	Technical Director	1	0.8
	Total	**130**	**100**
Education Qualifications	Master's Degree	15	11.5
	Bachelor's Degree	109	83.2
	Diploma	4	3.1
	Certificate	3	2.3
	Total	**131**	**100**

The majority of respondents have educational qualifications of bachelor degree and above (94.7%) most of them being bachelor degree holders, amounting to 83.2%. Universities in Tanzania offer quantity surveying starting from bachelor degree level; therefore since most of the respondents are quantity surveyors could be the reason why most of them have bachelor degrees as well. The level of education and professional qualification of the respondents give confidence in the reliability of the data collected. Both company experience and personal experience have the majority of respondents in the group 1-5 years with 67.2% and 81.7% respectively (Table 4.2). This is in line with the observation by Aje *et al* (2016) that most of the small class contractors fall out of business within five years of establishment.

Table 4. 3 Company Experience by Contractor's Classes

Variable	Contractor's Class							
	Class 4		Class 5		Class 6		Class 7	
	Count	%	Count	%	Count	%	Count	%
Less than 1 Year	0	0.0	0	0.0	0	0.0	0	0.0
1-5 Years	5	5.7	21	23.7	32	36.4	30	34.1
6-10 Years	16	51.6	12	38.7	0	0.0	3	9.7
Over 10 Years	10	83.3	2	16.7	0	0.0	0	0.0

For company experience, only 36.2% of the firms are above 6 years of existence in the industry. It was further observed that the majority of the contractors as they grow their survival chances increase, as shown in Table 4.3, 90.3% of all the respondents with "6-10

years" of experience are from class 4 and class 5 while it is only 9.7% for the same in class 6 and class 7. It is also observed 100% of respondents with over 10 years are from class 4 and class 5 and non for class 6 and class 7.

4.4 Reliability Test

A Reliability test was performed using Cronbach's Alpha test where the value ranging 7.0 and above are considered reliable (Farouq , 2016). According to (Pallant, 2007) any value of Cronbach's Alpha coefficient above 5.0 for the latent variables with less than ten observed variables is considered reliable. Therefore values of alpha in this study ranged between 0.674 (Use of Historic Data) and 0.858 (Draft and Review Strategy).

Table 4. 4 Reliability Analysis

Variable	Cronbach's Alpha	No. of Items (Observed Variables)	Remark
Focused Strategic Bidding	.837	3	Reliable
Use of Historic Data	.674	2	Reliable
Draft and Review Strategy	.858	6	Reliable
Market Intelligence	.701	3	Reliable
Aggressive Bidding Strategy	.768	2	Reliable
Use of bid preparation software	.724	2	Reliable
Teaming up with established business	.688	4	Reliable
Systematic Bidding approach Strategy	.782	4	Reliable
Pricing Strategy	.746	5	Reliable

4.5 Contractor's Bidding Strategies

Contractors bidding strategies were analyzed and discussed prior to model development for the establishment of the relationship between contractors' bidding strategies and tender success rate. A total of nine contractors' bidding strategies relevant for small and medium-class contractors in developing countries were identified from the literature. Each bidding strategy in the questionnaire was explained with a number of sufficient reliable observed variables as shown in Table 4.4 and appendix I. Table 4.5 indicates bidding strategies identified and ranked using mean scores and standard deviations. The maximum highly ranked strategy has the mean score of 3.9008 (Use of Historic Data) and the least ranked bidding strategy has the mean of 1.8811 (Aggressive Bidding Strategy). This section will discuss the highly ranked bidding strategies and one least ranked bidding strategy.

i. Use of Historic Data

Use of historic data has been ranked the most used bidding strategy with the mean score of 3.90 and standard deviation of 0.65 as shown in Table 4.5. Historic data in tendering is of paramount importance because of its use in different sections of tender preparation and submission ranging from price to other technical document submissions (Vandi, 2020). The use of "Use of Historic Data" category-wise appears to be relatively the same throughout all classes of contractors as shown in Table 4.6. This could be explained by the reason that at least all contractors have over a year of experience in the market and have attempted bidding for several projects. Therefore they all have a substantial amount of historic data repository at their disposal for reference. The study also concurs with study by Kimms, (2007) which emphasizes on the use of previous data available to be able to determine the probability of winning tenders. The researchers emphasized not only on the use of one's historic data but also of the competitors whenever they can be obtained. The study by Aje, Oladinrin, & Nwaole, (2016) indicated the importance of estimating labour productivity and tender prices from previous projects.

The observed variables that explain this latent variable can be seen in Appendix I. The use of price from the previous tender has appeared as the most used method in this strategy with a mean score of 4.15. Contractors rarely establish prices from the first principle when tendering, they normally use the price from previous projects or other tenders and adjust for time difference and location (Aje, et al., 2016). The use of historic data as part of bid submission appears lower than price but its use is also significant with a mean score of 3.66. Each project requirement is different and so will be the required document which limits the use of documents from previous tenders and projects. On the other hand, previous projects' experience and performance are always a vital attachment while tendering for new works as insisted in the study by Arif, et al., (2015).

ii. Draft and Review strategy

Draft and review strategy has been ranked the second most used bidding strategy by contractors with the mean score of 3.72 and standard deviation of 0.82 as indicated in Table 4.5. Category wise this bidding strategy appears to be mostly used by class four and five contractors as compared to class six and seven contractors as shown in Table 4.6. For the observed variables the use of attachment checklist and checking the accuracy of the bills of quantities before tendering with the mean score of 4.43 and 4.08 respectively appear to be the

most used, whereas preparation draft document is the least used method with the mean score of 2.87 below the average mean score of 3.00 as shown in the in Appendix I.

Table 4. 5 Contractors' Bidding Strategies

Bidding Strategies	N	Mean	Std. Deviation	Ranking
Use of Historic Data	131	3.9008	.64575	1
Draft and Review Strategy	131	3.7176	.81830	2
Systematic Bidding approach Strategy	131	3.3702	.82878	3
Market Intelligence	131	3.3282	.87216	4
Pricing Strategy	131	2.9695	.87652	5
Teaming up with established business	131	2.3238	.43205	6
Focused Strategic Bidding	131	2.2856	.86489	7
Use of Bid Preparation Software	131	1.9237	.71649	8
Aggressive Bidding Strategy	131	1.8811	.29065	9

Draft and review strategy involves preparation of draft document and then review the document for errors prior to submission. This study concurs with the study by Hanák, et al., (2021) where more than 78% of contractors in Czech republic were to use thi strategy in tender preparation. Contractors in this study are found to check the accuracy of quantities prio to bid preparation concuring to the observation by Varma, Manideep, & Asadi , (2016) who obsereved a lot of inaccuracy to the bills of quantities provided by the client. On the other hand, the attachment checklist is mostly used because contractors want to avoid missing out on submission components of the tender as once the document leaves the tenderer there is no room for addition or omission (Izane, 2018).

It was also observed that medium class contractors use this strategy more as compared to lower class contractors. The reason for such difference could be because as contractors class goes high, proper organization of office procedures including tendering is perfected leading to the high use of this strategy.

iii. Systematic Bidding Strategy

Systematic bidding strategy has been ranked the third most used bidding strategy with a mean score of 3.37 and standard deviation of 0.83 (Table 4.5). Furthermore contractors class 4 and class 5 use more this strategy than contractors class 6 and class 7 as seen in Table 4.6 by comparison of means. Plan for bid preparation and systematic bid procedures are the most used methods in this strategy. Furthermore observation from observed variables indicates that

plan for bid preparation and systematic bidding procedure being the most used with the mean score of 3.85 and 3.47 respectively.

Table 4. 6 Contractors' Bidding Strategies by Contractors Classes

Variable	Contractor's Class (Mean)			
	Class 4	Class 5	Class 6	Class 7
Focused Strategic Bidding	2.84	2.39	1.95	1.97
Use of Historic Data	3.87	3.99	3.94	3.80
Draft and Review Strategy	3.76	3.76	3.62	3.73
Market Intelligence	3.29	3.54	3.22	3.24
Aggressive Bidding Strategy	1.79	1.80	1.96	1.98
Use of bid preparation software	2.11	2.14	1.75	1.68
Teaming up with established business	2.04	2.35	2.42	2.47
Systematic Bidding approach Strategy	3.60	3.61	3.17	3.09
Pricing Strategy	3.29	2.97	2.69	2.94

Systematic bidding strategy involves having and following a well-documented bidding procedure in bid preparation. Contractors follow the same procedures knowingly or unknowingly all the time they prepare tenders for competitive bidding. These are the internal tendering procedures advocated by Urquhart (2017) that need to be documented and followed by contractors. This study confirms argument raised by Vandi, (2020) on the importance of having a systematic procedure to prepare bids. Findings show that this strategy relies mostly on "planning for bid preparation" and "the follow of systematic bidding procedure". Bid preparation involves multidisciplinary professions in the preparation and cost, therefore proper planning for linking all these resources is paramount to achieve the desired goal. Since all of the contracting companies are business-oriented and cost-conscious that is why planning for tender preparation has emerged as the most used method in this strategy.

Findings in Table 4.6 further indicate that medium-class contractors follow more systematic bidding procedures as compared to the lower class contractors. Medium class contractors have been in the market for a long and have perfected and mastered their tendering procedure allowing them to rely on those procedures than small class contractors.

iv. Aggressive Bidding Strategy

On the other hand, aggressive bidding strategy has been ranked the least used bidding strategy by the building contractor with the mean score of 1.88 and the standard deviation of 0.29 (Table 4.5). Small contractors (class 6 and class 7 with mean scores of 1.96 and 1.98

respectively) use this strategy more compared to medium contractors (class 5 and class 4 with the mean score of 1.80 and 1.79 respectively) as seen in Table 4.6.

Aggressive strategy as the name implies involves taking aggressive measures in trying to enter a new market or survive bad market period. Findings of this research indicates that contractors do not use much of this strategy and could be the reason why most of them fall out of business for lack of works as explained by Aje, et al., (2016). Although it is the least used strategy findings shows it is more used by small contractors as compared to medium contractors. According to Vandi (2020), the main aim of this strategy is to help the firms survive the bad times and penetrate new market, therefore small contractors being relatively new to the market use this strategy to be able to penetrate.

v. Bid Preparation Software

The use of Bid preparation software has been ranked the second least used bidding strategy by building contractors with a mean score of 1.92 and a standard deviation of 0.43. Bid preparation software strategy involves the use of computerized software to analyse, compute and prepare bids. The use of software in bid preparation has been said to save time, cost and assist in the preparation of error-free professional tender Vandi (2020). Since it has been observed small and medium contractors do not use much of this strategy could be one of the reasons for the low tender success rate. Findings in Table 4.6 further shows that this strategy is mostly used by medium contractors as compared to small contractors. Ranking this strategy the second lowest does not mean it is least important, paradigm change is required among contractors to do away with traditional means of tender preparation and adopt the use of software as advised by Varma, Manideep, & Asadi , (2016)to increase their chances of winning.

4.6 Contractors' Tender Success Rate

Findings of this study indicate a fairly good tender success rate of Contractors as seen in Table 4.7 with an average score of 24.29%. According to Alkhateeb et al, (2020), success rate between 10-25% is considered to be fairly good. The success rate observed has been mainly influenced by the medium class contractors (class 4 and class 5) who have an average success rate of 0.35 and 0.29 respectively. Small class contractors on the other hand have a lower success rate of 0.16 and 0.15 for class 6 and class 7 respectively.

Table 4. 7 Tender Success Rate Comparisons

Contractor's Class				
	Class 4	Class 5	Class 6	Class 7
Tender Success Rate (Mean)	.35	.29	.17	.16
Company Experience				
	Less than 1 Year	1-5 Years	6-10 Years	Over 10 Years
Tender Success Rate (Mean)	.	.21	.28	.37
Personal Experience				
	Less than 1 Year	1-5 Years	6-10 Years	Over 10 Years
Tender Success Rate (Mean)	.	.23	.28	.30
*Mean .2429 *Median .222 *Standard Deviation .12129				

The relationship has been observed from the collected data between contractors' class and success rate. Findings in Table 4.7 show that medium-class contractors have a high success rate all above the mean success rate of 0.2429 with mean scores of 0.35 and 0.29 for class 4 and class 5 respectively. On the other hand, small class contractors have a lower success rate way below the mean tender success rate with mean scores of 0.17 and 0.16 for class 6 and class 7 respectively. According to the categories by Alkhateeb, et al., (2020) with the observed mean score, medium class contractors fall on the excellent success rate group whereas the small class contractors fall in the "good success rate" group.

The relationship observed in Table 4.7 can further be explained by findings in Table 4.8 . There is a statistically strong negative relationship between contractor class and tender success rate with with correlation coefficient of -0.628. Significant strong positive relationship has also been observed between tender success rate and company experience with correlation coefficient of 0.423. Personal experience has desplayed weak relationship with tender success rate. these findings indicates that as contractor class moves from medium to lower tender success rate decreases as well. On the other hand as tender success rate increases as company experience increases.

Table 4. 8 Tender Success Rate Relationship with Companys' Attributes

Variables		**Tender Success Rate**	**Contractor's Class**	**Company Experience**	**Personal Experience**
Tender Success Rate	Pearson Correlation	1	.628**	.423**	.142
	Sig. (2-tailed)		.000	.000	.106
Contractor's Class	Pearson Correlation		1	.613**	.163
	Sig. (2-tailed)			.000	.063
Company Experience	Pearson Correlation			1	.271**
	Sig. (2-tailed)				.002
Personal Experience	Pearson Correlation				1
	Sig. (2-tailed)				
**. Correlation is significant at the 0.01 level (2-tailed).					

Companies with more than 10 years of experience have a success rate of 0.37 which is in the excellent rate of success, whereas contractors with experience ranging between 1-5 years had a mean success rate of 0.21. The same is for a professional experience with the mean success rate of 0.30 and 0.23 for "over 10 years" and "1-5 years" respectively.

Table 4. 9 Contractors' Tender Success Rate

Tender Success Groups		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Above 40**	24	18.3	18.3	18.3
	20%-40%	46	35.1	35.1	53.4
	Below 20	61	46.6	46.6	100.0
	Total	**131**	**100.0**	**100.0**	

Table 4.9 further shows that about 46.6% of all contractors have a success rate below 20% which is approximately the same as the findings by (Hanák, et al., 2021) who found more than 48% of all contractors in Czech Republic had a success rate below 20%. About 35.1% of respondents have a success rate ranging between 20-40% which accommodates many contractors as compared to the study by (Hanák, et al., 2021) who had only 24% of all contractors. The group of contractors with success rates above 40% is only about 18.3%, far less compared to 28% of contractors in Czech Republic. The difference between this study and one by Hanak can be credited to two major reasons; first and foremost is because Czeck Republic is a developed country situated in central Europe where the companies not only tender within the country but also outside the boundaries of their country. Second reason is based on the class of contractors consdered in the study. This study is centered on small and medium contractors while the study by Hanak included all classes of contractors.

4.7 Data Preparation for Inferential Analysis

4.7.1 Test of Normality

Normality test is significant prior to further inferential analysis so as to avoid the problem of misinterpretation of results. Although Williams, et al., (2013) argues that multiple regression has the robustness to autocorrect the problem of skewness and kurtosis in data, but Osborne & Waters, (2002) insist not to leave this issue into chance as it has a great effect on the relationship that will be established.

Normality test in the SPSS was done by observing the box plot and the Z-values calculations. Box plot was used to identify the outliers whereas the Z-values were used to statistically calculate the Skewness and kurtosis values of the variables, given as $Z_{skewness}$ and $Z_{kurtosis}$

respectively. For data to be normally distributed the Z-score is supposed to be zero, which is difficult to attain therefore Z-score value ranging between +/- 1.96 is allowable for the confidence interval of 95%. According to Luvara (2020) for larger samples, normality can be ascertained by observing the histograms or elevate the Z-score to +/- 2.58. This study, therefore, adopts Z-score values of +/- 1.96. Z-score values are calculated by dividing the skewness or kurtosis value by the standard error of skewness or kurtosis respectively.

The observation of the box plot histogram and Z-value calculation indicated that data are not normally distributed and therefore data transformation is necessary. All variable Z-values were within the required threshold except for Focused Strategic Bidding, Aggressive Bidding Strategy, Bid Preparation Software, and Tender Success Rate which are above the allowable Z-score. First Logarithmic transformation was performed trying to normalize the data but appeared to worsen the problem therefore Square root transformation was opted and Normality test was checked again. After Square root transformation it was found that data were finally normally distributed warranting performance of parametric analysis for a second and third specific objective.

Table 4. 10 Z-score Values of Variables

Variable	Before Square Root Transformation		After Square Root Transformation	
	Z-Values		Z-Values	
	$Z_{skewness}$	$Z_{Kurtosis}$	$Z_{skewness}$	$Z_{Kurtosis}$
Tender Success Rate	3.33	-0.86	0.99	-1.22
Focused Strategic Bidding	4.08	0.05	2.00	-0.39
Use of Historic Data	-2.22	2.34	-0.15	0.08
Draft and Review Strategy	-0.87	-1.87	1.37	-1.76
Market Intelligence	0.72	-1.53	-0.51	-1.65
Aggressive Bidding Strategy	1.01	-0.03	-0.77	-0.36
Bid Preparation Software	3.20	0.70	1.47	0.00
Teaming with Established Business	0.84	2.27	-1.73	1.55
Systematic Bidding Approach	-0.24	-1.46	-1.58	-0.70
Pricing Strategy	1.92	-0.43	0.11	-0.47

Before performing the square root transformation the nature of skewness of data was identified where positive skew had a slightly different formula from negative skew. For positive skewed data, square root of the particular variable was calculated while on the negative skew reflective transformation had to be performed given by the formula shown below.

$$Trans.Var = \sqrt[2]{MaxValue + 1 - Var}$$

Where Trans.Var is a transformed variable, MaxValue is the maximum value among the variable to be transformed and Var is the variable to be transformed.

4.7.2 Factor Analysis with Principal Component Analysis

Prior to analysis of the relationship between tendering strategies and tender success rate, dimension reduction was performed using factor analysis with principal component analysis which also helped in the grouping of the observed variables. Since sample data conformed to normality after transformation as tested earlier in this chapter and component correlation matrix values do not exceed 0.32, orthogonal rotation (Varimax) was used to perform the factor analysis. The results indicated that sampling adequacy is satisfactory to allow further inferential analysis as the Kaiser-Meyer-Olkin (KMO) for sampling adequacy results was 0.699 way above the minimum allowed value of 0.5 as can be seen in Table 4.11. On the other hand, the result shows there is an adequate correlation between independent variables as measured by Bartlett's Test of Sphericity in Table 4.11 where the value P is less than 0.05 at 95% confidence interval.

Table 4. 11 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.699
Bartlett's Test of Sphericity	Approx. Chi-Square	3137.088
	df	465
	Sig.	.000

Factors were then grouped based on the factor loadings of the rotated component matrix as seen in Table 4.12. Factors were set to be grouped into nine principal components (Groups) by the forced factor extraction method, to retain the number of previous groups. Some overlapping of factor loading can be seen in Table 4.12, but factors with the strongest loadings were selected for grouping. Therefore group names are as follows; Component 1: Pricing Strategy, Component 2: Marketing Intelligence, Component 3: Draft and Review Strategy, Component 4: Bid Preparation Software, Component 5: Teaming with Established Business, Component 6: Aggressive Bidding Strategy, Component 7: Use of Historical Data, Component 8: Systematic Bidding Approach and Component 9: Focused Strategic Bidding.

Table 4. 12 Rotated Component Matrix

Rotated Component Matrix[a]									
Factors	**Component**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Different mark up to different BOQ items	**.855**								
Bid/no-bid criteria of the firm	**.820**			.324					
Standard rate table	**.797**								
Bid decision models	**.749**			.363					
Competition based price	**.701**							.374	
Consortia	**.633**			.573					
Look for the market condition to prepare an estimate	**.528**	.523							
Check accuracy issued of drawings	**.422**	.318	.361						-.395
Find information about other tenderers		**.806**							
Plan for bid preparation		**.781**	.368						
Find client and financier information		**.746**					.368		
Cost-based pricing (cost + markup)		**.727**							
Systematic Bidding procedure		**.699**							
Select bid team with the manager		**.554**	.413						
Bid preparation framework	.497	**.503**		.315					
Market-based price		**.433**	.351	.345	-.423				
Use attachment checklist for bid submission			**.799**					.301	
Check accuracy of issued Bills of Quantities		.366	**.782**						
Check the accuracy of the issued tender document	.368	.318	**.653**						
Proofread the document before submission	.470	.350	**.583**						
Estimation software				**.793**					
Bid decision software	.490			**.625**		.376			
Prepare draft document before final document	.347	.385	.335	**.495**					
Partnership					**.900**				
Joint venture					**.836**				
Bid at zero profit						**.860**			
Bid below the profit margin						**.827**			
Use historic data as part of bid submission							**.847**		
Use price from previous tenders							**.820**		
Strategic alliance					.342			**.749**	
Bid/no-bid decision before bidding	.581								**.636**
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.									
a. Rotation converged in 12 iterations.									

4.8 Relationship between Contractors Bidding Strategies and Bid Success Rate

Findings for contractors' tendering strategies used by small and medium-class building contractors have been discussed in detail earlier in this chapter as well as the bid success rate. This objective aims at discussing the relationship between tendering strategies and tender success rate.

Table 4. 13 Correlations Coefficient Table

		Tender Success Rate	Pricing Strategy	Market Intelligence	Draft and Review Strategy	Bid Preparation Software	Teaming with Established Business	Aggressive Strategic Bidding	Use of Historic Data	Systematic Bidding Approach	Focused Strategic Bidding
Tender Success Rate	Pearson Correlation	**1**	**.589****	**.365****	**.022**	**.160**	**-.143**	**.122**	**.019**	**-.142**	**-.198***
	Sig. (2-tailed)		**.000**	**.000**	**.801**	**.068**	**.103**	**.165**	**.830**	**.107**	**.024**
Pricing Strategy	Pearson Correlation		1	.000	.000	.000	.000	.000	.000	.000	.000
	Sig. (2-tailed)			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Market Intelligence	Pearson Correlation			1	.000	.000	.000	.000	.000	.000	.000
	Sig. (2-tailed)				1.000	1.000	1.000	1.000	1.000	1.000	1.000
Draft and Review Strategy	Pearson Correlation				1	.000	.000	.000	.000	.000	.000
	Sig. (2-tailed)					1.000	1.000	1.000	1.000	1.000	1.000
Bid Preparation Software	Pearson Correlation					1	.000	.000	.000	.000	.000
	Sig. (2-tailed)						1.000	1.000	1.000	1.000	1.000
Teaming with Established Business	Pearson Correlation						1	.000	.000	.000	.000
	Sig. (2-tailed)							1.000	1.000	1.000	1.000
Aggressive Strategic Bidding	Pearson Correlation							1	.000	.000	.000
	Sig. (2-tailed)								1.000	1.000	1.000
Use of Historic Data	Pearson Correlation								1	.000	.000
	Sig. (2-tailed)									1.000	1.000
Systematic Bidding Approach	Pearson Correlation									1	.000
	Sig. (2-tailed)										1.000
Focused Strategic Bidding	Pearson Correlation										1
	Sig. (2-tailed)										

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

*. Correlation is significant at the 0.05 level (2-tailed).

Pearson correlation (r) will be used in studying this relationship because variables conform to all conditions of parametric analysis. Coefficient of correlation used to measure the strength of association between tendering strategies and tender success rate, are r=0 (No relationship), r=0.1 (Negligible), r=0.2 (Weak), r=0.3 (Moderate) 0.4-0.6 (Strong), r=0.7-0.9 (Very Strong) and r=1 (Perfect).

Table 4.12 shows correlation matrix which explains the relationship between Tender success rate and bidding strategies. Strategies that have a significant relationship with tender success rate at 95% confidence interval have been marked with asterisk. Coefficient with negative sign has the inverse relationship between tendering strategies and tender success rate where positive coefficients indicate direct/positive relationship.

Bidding strategies that have a positive relationship with tender success rate are Pricing Strategy, Market Intelligence, Draft and review strategy, Bid Preparation Software, Aggressive strategic bidding, and the Use of Historical Data. On the other hand bidding strategies that have a negative relationship with tender success rate include, Teaming with Established Business, Systematic Bidding Approach, and Focused Strategic Bidding. Findings show that six (6) out of nine (9) independent variables (bidding strategies) have a positive association with the dependant variable (tender success rate).

i. Pricing strategy

Pricing strategy uses bid price as the key tool in winning tenders. Deals with the whole process of preparing bid price, deciding optimum mark up, skilful distribution of the agreed mark up, probing the market of the existing market prices and many other techniques employed by the contractor trying to win tenders. Findings indicate existence of the highest association between pricing strategies and tender success rate with the correlation coefficient of 0.589 as seen in Table 4.13. According to Akoglu, (2018), a correlation of 0.589 explains the existence of a strong positive relationship between pricing strategy and tender success rate. As described earlier in this chapter pricing strategy is ranked the sixth in the frequency of use of the tendering strategies used by building contractors with a mean score of 2.97. These findings conform to the study by Oo, et al. (2012), which indicated that there is a positive relationship between tender success rate and pricing strategies.

A graphical representation of this relationship can be seen in Figure 4.1 where points are fairly clustered around the line of fit as it ascends from the bottom left to the top right. The

findings further explain that 34% (R^2=0.347) of variations in the dependant variable are being caused by this independent variable (Pricing strategy).

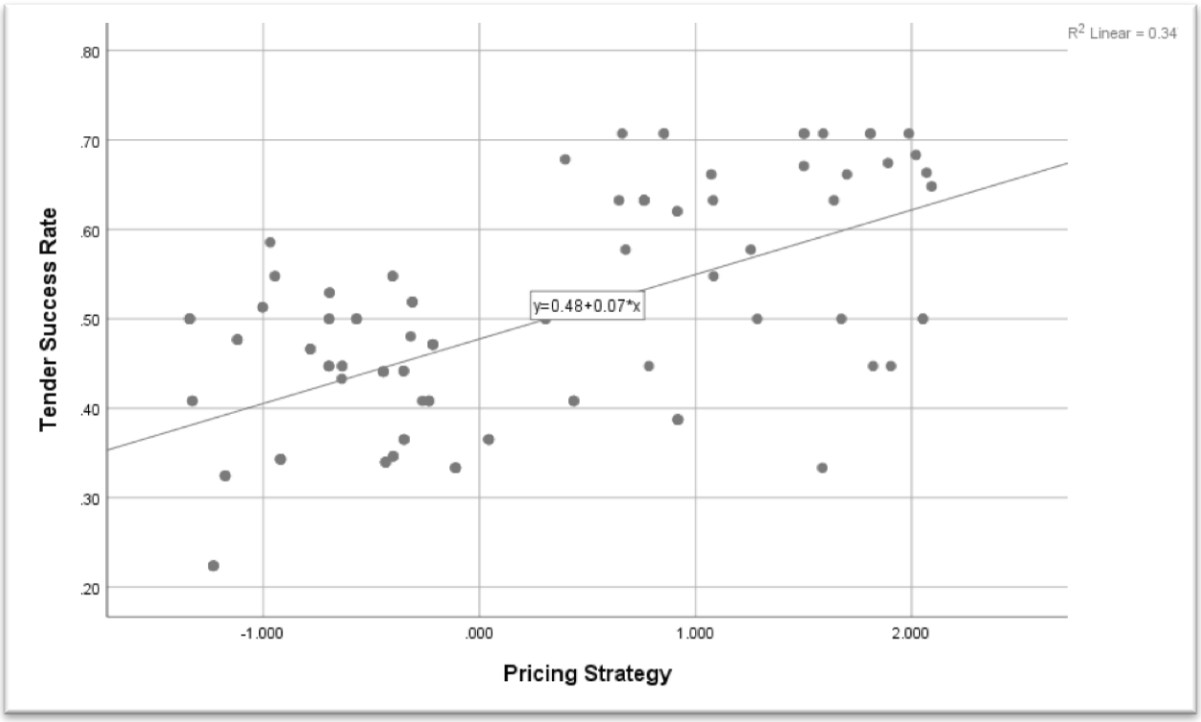

Figure 4. 1 Scatter Plot "Tender Success Rate-Pricing Strategy" Relationship

ii. Market Intelligence

Market intelligence strategy involves probing into the market to collect information that aids in preparation of competitive bids. Market intelligence is the second strategy that has strong positive relationship with a tender success rate. This strategy according to findings in Table 4.12 has a correlation coefficient of 0.365. This indicates statistically significant relationship exist between this strategy and tender success rate. These findings confirm the statement made by Vandi, (2020), who said: "tender is more likely to be successful if market intelligence is given ample consideration during the time of tendering". Findings of this study are also in line with suggestion by Aje, Oladinrin, & Nwaole, (2016), that for preparation of competitive price there is a need to seek market information about prices, clients information and competitors information. These informations aids at increasing wining chances by making informed decisions on different aspects of tender preparation process.

Early in this chapter this strategy was ranked the 4th with a mean score of 3.33 on the frequency of use. Indicating contractors do not use this strategy enough, and that could be one of the reasons for their low success rate.

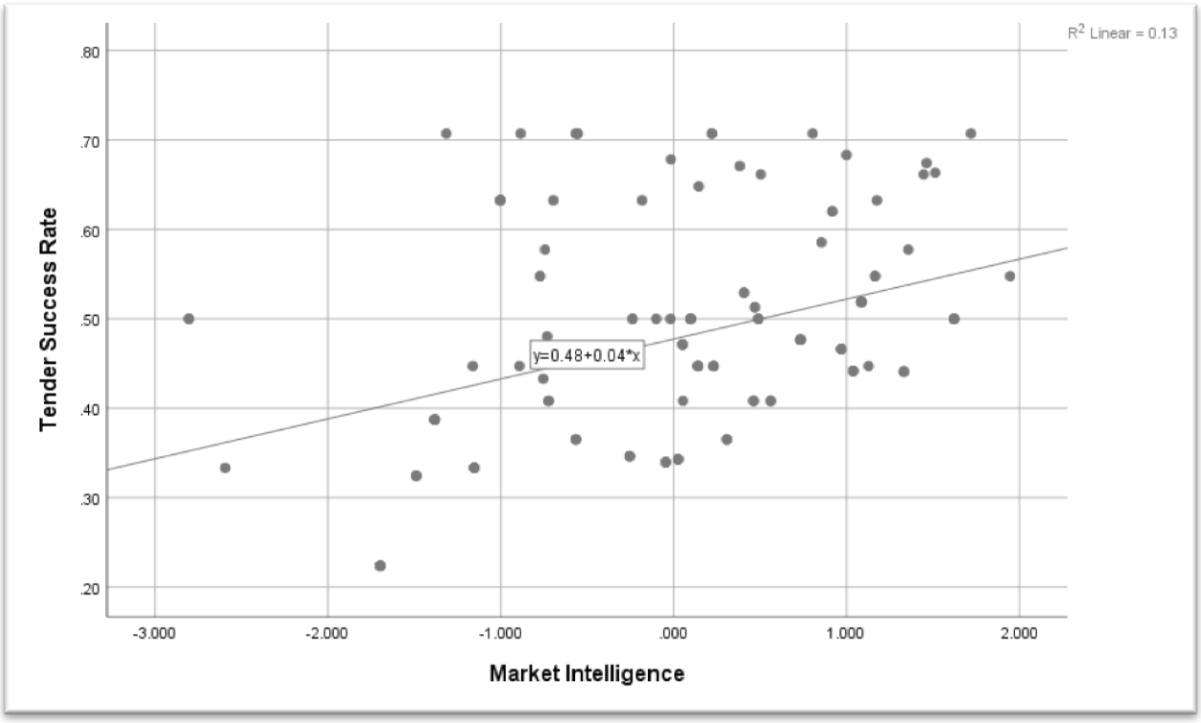

Figure 4. 2 Scatter Plot "Tender Success Rate-Market Intelligence" Relationship

Figure 4.2 portrays a graphical representation of the relationship between tender success rate market intelligence. According to the scatter plot above points are seen to scatter around the line of fit which is ascending as it moves from left to right in which a total of 13.3% (R^2=0.133) of all variation to the dependant variables are caused by this independent variable.

Other independent variables that have a positive association with tender success rate have a weak linear relationship. These strategies include Draft and review Strategy (0.022), Bid Preparation Software (0.160), Aggressive Strategic Bidding (0.122), and Use of Historic Data (0.019). There are also three variables with a negative correlation coefficient which are Teaming up with established business (-0.143), Systematic Bidding Approach (-0.142), and Focused Strategic Bidding (-0.198).

The strategy that has a negligible relationship with the tender success rate is "the use of historic data" with a correlation coefficient of 0.019. This strategy according to the frequency of use was ranked first with a mean score of 3.9008. These findings indicate that strategies perceived by the contractor to influence tender success rate does not have much contribution. Some of them have negligible association with tender success rate while others have negative association.

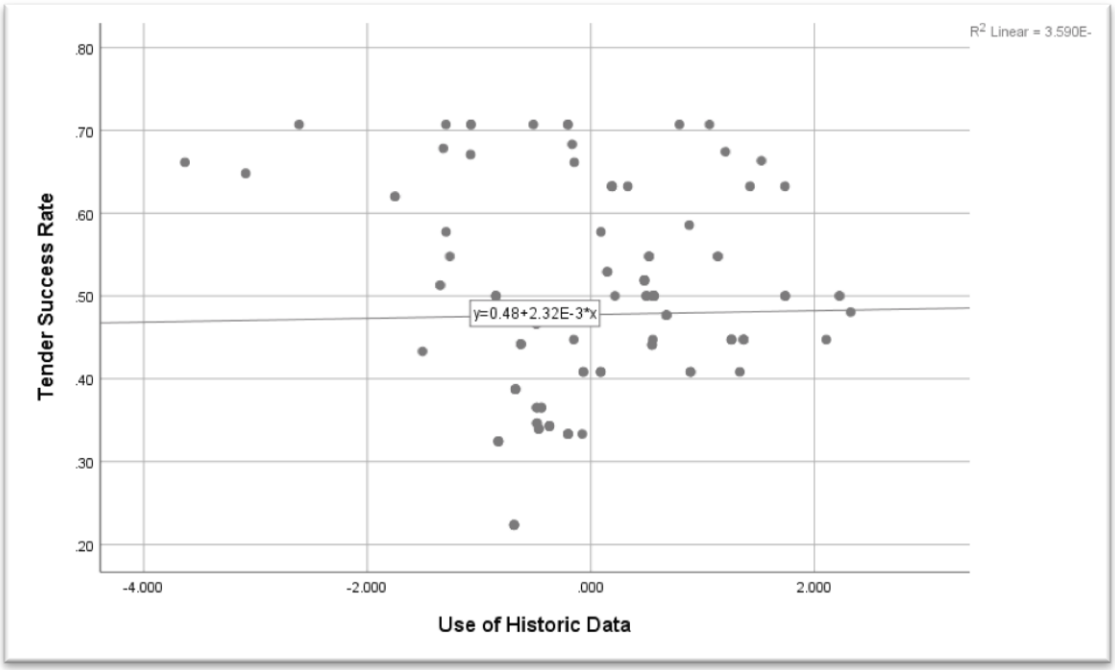

Figure 4. 3 Scatter Plot "Tender Success Rate-Use of Historic Data" Relationship

The graphical presentation of this relationship is given in Figure 4.3 above. Points are seen to be randomly scattered showing no defined pattern and the line of best fit is relatively flat indicating changes in the variable "use of historic data" have a negligible effect on the change of tender success rate. Furthermore, only about 0.036% (R^2=3.590E-4) of all the variation in the dependent variable can be pointed from this independent variable.

Generally, there is a significant relationship between bidding strategies and tender success rate. Table 4.14 presents the correlation between the tender success rate and the combined effect of bidding strategies. The results indicate that there is a significant strong relationship between bidding strategies and tender success rate with a correlation coefficient of 0.775 at 95% confidence interval (P<0.05).

Table 4. 14 Correlations Coefficient between Bidding Strategies (Combined) and Tender Success Rate

Variables		Tender Success Rate	Bidding Strategies Combined
Tender Success Rate	Pearson Correlation	1	.775**
	Sig. (2-tailed)		.000
	N	131	131
Bidding Strategies Combined	Pearson Correlation	.775**	1
	Sig. (2-tailed)	.000	
	N	131	131
**. Correlation is significant at the 0.01 level (2-tailed).			

Furthermore, the graphical presentation of the relationship between bid success rate and combined effect of bidding strategies in Figure 4.4 indicates that a total of 60% (R^2=0.601) of variations in the dependant variable are caused by the variations in the independent variables (bidding strategies).

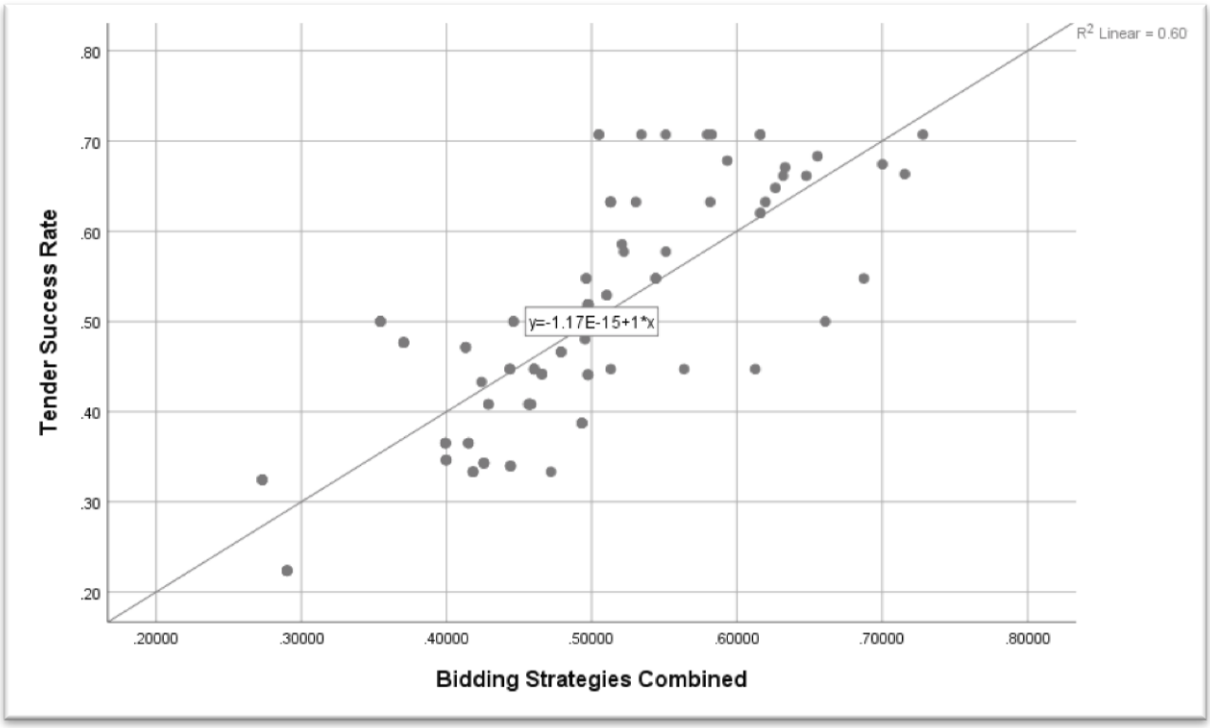

Figure 4. 4 Scatter Plot "Tender Success Rate-Bidding Strategies" Relationship

4.9 Model for Predicting the Impact of Tendering Strategies on Tender Success Rate

This section aims at developing a model for predicting tender success rate by analysing the use of different tendering strategies. As discussed earlier in this chapter, six out of nine tendering strategies were relevant for inclusion in the model. Out of the six variables, only two had a significant positive relationship with tender success rate and therefore only these two variables will be considered in model development. The two variables are Pricing Strategy and Market Intelligence with Pearson Correlation coefficients of 0.589 and 0.365 respectively. Furthermore, since square root transformation was used to aid in data normalization, the reverse transformation has been applied to enable meaningful interpretation of the model results.

Prior to model development data was split into two groups at 70%:30% for model training sample and model validation sample respectively. 70% of the data was used to train the model

and 30% was used to validate the model. The coming part starts with model training where only 70% was used throughout.

4.9.1 Alternative Model 1; Base Model

Table 4.15 presents the results for the multiple regression model between Tendering Strategies and Tender success rate with the coefficient of determination of 0.474 (R^2) and coefficient of correlation of 0.689 (R). As discussed earlier in this chapter coefficient of correlation indicates the existence of a strong positive linear relationship between bidding strategies and tender success rate. On the other hand coefficient of determination indicates that 47% of the variance in the tender success rate is caused by variance in these two tendering strategies whereas the remaining 53% is the result of causes other than these two tendering strategies. The R-Square obtained satisfies the minimum required value of R^2=25% for the goodness of fit of the model (Zentner, 2017).

Table 4. 15 Regression Model Summary

Model	R		R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson Statistic	
	sample = 70% sample (Selected)	sample ~= 70% sample (Unselected)				sample = 70% sample (Selected)	sample ~= 70% sample (Unselected)
1	.689[a]	.666	.474	.462	.09017	1.756	1.993
a. Predictors: (Constant), Market Intelligence, Pricing Strategy							
b. Unless noted otherwise, statistics are based only on cases for which sample = 70% sample.							
c. Dependent Variable: Tender Success Rate							

Durbin-Watson (1.756) test for serial correlation for the selected sample indicates that there is some degree of positive autocorrelation between successive observations but all within the allowable range. Results of table 4.15 further shows closer prediction power between the selected sample and unselected sample, with only 3% difference. R-square for unselected sample was obtained by squaring correlation coefficient of unselected sample (obtaining R2=0.443).

Table 4.16 presents model input results for transformed data. The standardized coefficients used to compare the contribution of each strategy in the model indicates that Pricing strategy has a greater contribution with the standardized Beta value of 0.595 as compared to the Pricing strategy with the standardized Beta value of 0.359, but all variables are highly statistically significant with p-values less than 0.05. Inputs to the model (before reverse transformation) $Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \varepsilon$ presented in Table 4.15 are β_0 =0.476, $\beta_1 = 0.078$, $\beta_2 = 0.042$ as constant/intercept and coefficients for Pricing strategy and Market

intelligence respectively. The regression equation based on the inputs from Table 4.16 will be $Y = 0.476 + 0.078X_1 + 0.042X_2$ but the interpretation of this model before reverse transformation will distort the intended meaning therefore model will be interpreted based on the reverse transformed data.

Table 4. 16 Model Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.476	.010		49.431	.000
	Pricing Strategy (PS)	.078	.010	.595	7.652	.000
	Market Intelligence (MI)	.042	.009	.359	4.621	.000
a. Dependent Variable: Tender Success Rate						
b. Selecting only cases for which sample = 70% sample						

Reversing the square root transformation was performed by introducing the square root sign on the dependant variable and then squaring both sides of the equation to obtain the original values (Pek, et al., 2017). Equation **4.4** presents the final regression equation model which will be used in the interpretation.

$$\sqrt{Y}=(\boldsymbol{\beta_0}+\boldsymbol{\beta_1}\mathbf{X_1}+\boldsymbol{\beta_2}\mathbf{X_2}) \quad \textbf{4.1}$$

$$(\sqrt{Y})^2=(\beta_0+\beta_1 X_1+\beta_2 X_2)^2 \quad \textbf{4.2}$$

$$Y=(\beta_0+\beta_1 X_1+\beta_2 X_2)^2 \quad \textbf{4.3}$$

$$\text{Tender Success Rate}=(0.476 + 0.078\mathbf{PS} + 0.042\mathbf{MI})^2 \quad \textbf{4.4}$$

4.9.2 Alternative Model 2; Personal Experience moderator variable

This model introduces moderator variable into the equation to assess any improvement on the prediction power of the model. Table 4.17 presents a summary for the regression model with Personal Experience as the moderator Variable. The findings indicate the existence of significant moderation effects with an increase of predictive power of the model by 12% (R Square Change = 0.120) at the 95% confidence interval ($p<0.05$). The coefficient of determination for the moderated model is there for 59.5% and the coefficient of correlation is 77.1% an increment from 47.4% and 68.9% respectively.

Observations from Table 14.17 have also pointed out existence of large variation between prediction powers of the model using two sets of sample. The selected 70% of the sample provides 59.5% prediction power as compared to 46.1% of unselected sample. The difference of about 13.4% between the two sample sets indicates the probability of model over fit.

Therefore although personal experience moderator increases the prediction power of the model may not be a good model for prediction purpose.

Table 4. 17 Regression Model Summary with Personal Experience as Moderator

Model	R		R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		Durbin-Watson Statistic	
	sample = 70% (Selected)	sample ~= 70% (Unselected)				R Square Change	Sig. F Change	sample = 70% (Selected)	sample ~= 70% (Unselected)
1	.689[a]		.474	.462	.09017	.474	.000		
2	.771[b]	.679	.595	.581	.07963	.120	.000	1.732	2.091
a. Predictors: (Constant), Market Intelligence, Pricing Strategy									
b. Predictors: (Constant), Market Intelligence, Pricing Strategy, Personal Experience									
c. Unless noted otherwise, statistics are based only on cases for which sample = 70% sample.									
d. Dependent Variable: Tender Success Rate									

Table 4.18 further explains the moderation effect on the model where it presents the coefficients of the model as well as pointing out the unique contribution of each variable to the model. The unique contribution of the variables Pricing strategy and Market Intelligence to the model has improved with the introduction of Personal experience as the moderating variable.

Table 4. 18 Coefficients for Regression Model with Personal Experience Moderator Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	.476	.010		49.431	.000			
	Pricing Strategy	.078	.010	.595	7.652	.000	.588	.634	.595
	Market Intelligence	.042	.009	.359	4.621	.000	.347	.444	.359
2	(Constant)	.265	.043		6.221	.000			
	Pricing Strategy	.088	.009	.674	9.573	.000	.588	.718	.657
	Market Intelligence	.045	.008	.391	5.670	.000	.347	.522	.389
	Personal Experience	.097	.019	.357	5.055	.000	.176	.479	.347
a. Dependent Variable: Tender Success Rate									
b. Selecting only cases for which sample = 70% sample									

The standardized coefficient has increased from 0.595 to 0.674 for pricing strategy and from 0.359 to 0.391 for Market Intelligence. Therefore the personal experience of the tenderers is statistically important to improve bid success rate when bidding for building works. All the input to the second model appears to be statistically significant with p-values less than 0.05.

4.9.3 Alternative Model 3; Company experience Moderator Variable

Company experience has been introduced into this model from the base model as the moderator variable trying to moderate the effect of bidding strategies to tender success rate. Table 4.19 presents a summary for the regression model with company experience as the

moderator variable. Findings indicate the existence of a significant moderation effect with an increment in the prediction power of the model by 6.8% (R^2 Change=0.068) at 95% confidence interval. The coefficient of determination for the moderated model is 54.2% and the coefficient of correlation is 0.736, an increment from 47.4% and 0.689 respectively.

Findings of Table 4.19 also explain prediction power comparison between selected sample and unselected sample. With R-square comparison the difference between prediction power of selected and unselected sample is 0.86%, indicating a probability of having optimum model fit.

Table 4. 19 Regression Model Summary with Company Experience as a Moderator

Model	R		R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		Durbin-Watson Statistic	
	sample = 70% (Selected)	sample ~= 70% (Unselected)				R Square Change	Sig. F Change	sample = 70% (Selected)	sample ~= 70% (Unselected)
1	.689[a]		.474	.462	.09017	.474	.000		
2	.736[b]	.742	.542	.526	.08466	.068	.001	1.599	2.201
a. Predictors: (Constant), Market Intelligence, Pricing Strategy									
b. Predictors: (Constant), Market Intelligence, Pricing Strategy, Company Experience									
c. Unless noted otherwise, statistics are based only on cases for which sample = 70% sample.									
d. Dependent Variable: Tender Success Rate									

Table 4.20 further explains the moderation effect of company experience by presenting the unique contribution of each moderator in the model. There is a slight reduction in the unique contribution of each variable in the model 2, but there is an increase in the combined effect in the prediction power as explained in equation 4.6. Equation one shows the summation of the unique contribution of each variable into the model. Company experience for this case has strengthens the contribution of the tendering strategies in predicting tender success rate.

$$\sum(Semi\ partial\ correlation)^2 = \mathbf{0.529^2+0.295^2+0.260^2 = 0.43} \quad \textbf{4.5}$$

Combined contribution = R^2- Equation (v) = 0.542 - 0.430 = 0.112 **4.6**

Table 4.20 Coefficients for Regression Model with Company Experience Moderator Variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	.476	.010		49.431	.000			
	Pricing Strategy	.078	.010	.595	7.652	.000	.588	.634	.595
	Market Intelligence	.042	.009	.359	4.621	.000	.347	.444	.359
2	(Constant)	.351	.036		9.680	.000			
	Pricing Strategy	.071	.010	.541	7.250	.000	.588	.616	.529
	Market Intelligence	.035	.009	.302	4.036	.000	.347	.399	.295
	Company Experience	.051	.014	.272	3.562	.001	.440	.359	.260
a. Dependent Variable: Tender Success Rate									
b. Selecting only cases for which sample = 70% sample									

4.10 Model Validation

Three alternative models have been developed in this study, a base model and two moderated models. Among the three model alternatives, model one and model three have shown more consistent results between the training sample and validation sample. Further analysis has shown that model three has more prediction power compared to model one.

Further validation of model three was conducted by comparing correlation coefficient of the two sample groups between predicted values and training values. Results on Table 4.21 indicate a significant strong relationship between the predicted values and training values of the two sample groups. Correlation coefficient between the two sample data indicates that 30% sample has slightly more relationship that 70% sample but their closeness indicates that this model does not over fit. For the 30% sample association between training values and predicted values is at correlation coefficient R = 0.742 and 0.736 for 70% sample group. Therefore it can be concluded that model three with dependant variable "tender success rate", independent variables pricing strategy and market intelligence and moderator variable company experience present an optimum fit.

Table 4. 21 Correlation between Training and Predicted Values.

Sample			Tender Success Rate	Predicted
30% sample	Tender Success Rate	Pearson Correlation	1	.742**
		Sig. (2-tailed)		.000
		N	41	41
70% sample	Tender Success Rate	Pearson Correlation	1	.736**
		Sig. (2-tailed)		.000
		N	90	90
**. Correlation is significant at the 0.01 level (2-tailed).				

Final model equation therefore will be as given in equation 4.7. As discussed earlier in this chapter reverse transformation need to be applied to have meaningful interpretation of results. In this equation contractors can attain only 12.3% success rate if none of the bidding strategies are used while 25.8% success rate can be attained with an increase in one unit of each of the bidding strategies used in the model.

Tender success rate = (0.351+0.071PS+0.035MI+0.051CE)2 **4.7**

4.11 Chapter Summary

This chapter has discussed in details findings from the collected data. Findings have been discussed by linking with the previous findings from the literature. Discussed findings have been arranged to follow the order of the specific objectives.

The study has revealed the existence of a significant relationship between biding strategies and tender success rate which warranted the development of a statistically significant prediction model using multiple regressions. The findings have also indicated that there is no relationship between the frequency of use of strategy and their impact on the success rate. The frequently used strategy such as "The use of Historic Data" is seen to have negligible influence on the tender success rate.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter finalizes the study on contractors bidding strategies and their influence on tender success rate. The study assessed biding strategies used by small and medium-class contractors and established the relationship between such strategies and tender success rate. Finally, the study developed the model for predicting tender success rate using bidding strategies as well as establishing the moderation effect of experience in the model. Therefore this chapter contains four main sections which are conclusion, recommendation, and area for further studies.

5.2 Conclusion

5.2.1 Contractors bidding strategies

The study has investigated tendering strategies used by small and medium-class building contractors in competitive bidding. The most significant used strategy as presented in Table 4.5 were, Use of Historic Data with the mean score of 3.90, followed by Draft and Review and Review Strategy, Systematic Bidding Approach, and Market Intelligence with the mean scores of 3.72, 3.37, and 3.33 respectively. On the other hand, the least significant strategies identified by the study include Focused Strategic Bidding, Use of Bid Preparation Software, and Aggressive Bidding Strategy with mean scores of 2.29, 1.92, and 1.88 respectively. Therefore this study concludes SMEs contractors do not use most of the bidding strategies which could be one of the reason of their low tender success rate.

5.2.2 Contractors tender success rate

In tender success rate, the study has concluded that the tender success rate of the majority of contractors is below average where about 55.7% of all contractors have a success rate below 23.9%. Furthermore according to results in Table 4.7, the study has indicated a gradual increase in the success rate with the increase in the class of contractors. Small class contractors have shown to have less success rate as compared to a medium class contractor whereas class seven and six have an average success rate of 16% and 17% respectively compared to class five and six who have a relatively higher success rate of 29% and 35%

respectively. This study has concluded that there is a strong linear relationship between tender success rate and company experience and contractor class.

5.2.3 Relationship between tender success rate and bidding strategies

The relationship between bidding strategies and the tender success rate has shown the majority of the variables have the desired positive linear relationship with the dependant variables. Only three out of nine variables have shown a negative linear relationship with the tender success rate which are Teaming with Established Business, Systematic Bidding Approach, and Focused Strategic Bidding with a correlation coefficient of -0.143, -0.142, and -0.198 respectively. On the other hand, two out of six remaining variables have shown a statistically strong positive linear relationship with dependant variable to warranty inclusion in the prediction model. The two strategies are Pricing Strategies and Market Intelligence with correlation coefficients of 0.589 and 0.365 respectively. Generally, independent variables have shown a strong positive linear relationship with the dependant variable with a correlation coefficient of 0.775.

5.2.4 Tender Success Rate Prediction Model

The study has also developed the prediction model for tender success rate with bidding strategies as independent variables. Out of three alternative models developed model was found to be statistically significant with a prediction power of about 54% with pricing strategy having greater contribution followed by market intelligence with 0.071 and 0.035 coefficients respectively whereas company experience acts as the moderator variable.

5.3 Recommendation

SMEs contractors have shown low tender success rate therefore should consider the use of experienced personnel in tender preparation. Findings have shown that personal experience has some moderation effect on tender success; that the company that uses experienced personnel in tendering is more likely to have a higher tender success rate. Therefore it is recommended that small and medium-class building contractors should try to use more experienced personnel in training their staff as well as assisting in tendering processes.

Market intelligence has surfaced as one of the two bidding strategies to significantly influence tender success rate. Therefore it is recommended that contractors should conduct a detailed market survey prior to bidding to collect all necessary information required for preparation of

bona fide tenders. Contractors should consider preparing a formal internal framework for conducting a market survey so as capture important information to be used in tender preparation

Pricing strategy has appeared to be a key strategy in winning tenders as previous researchers have stressed. It is therefore recommended that contractors should consider a selection of appropriate pricing methods to prepare reasonable competent prices. Furthermore, the study suggests that contractors should come up with innovative ways to come with competent prices, such as minimizing inefficiency and adopting cost-saving methods of works execution.

5.4 Area for Further Studies

Literature has pointed out that contractors “teaming up” have a positive impact both in tendering stage and during the execution of the works. Companies joining forces is said to increase their competitive power during tendering as well as the ability to undertake larger projects that could not be undertaken by individual contractors. Despite the mentioned benefits, findings of this study show “Teaming up” as one of the least used strategies. Therefore there is a need to undertake a study to find out why is it neglected and recommend ways to facilitate its use to reap these benefits for the small and medium contracting firms.

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APPENDIX I:

CONTRACTORS BIDDING STRATEGIES EXPLAINING VARIABLES

Variables	Not at all		Rarely		Average		Often		Very Often		Mean	Rank
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %		
Focused Strategic Bidding												
bid/no bid decision before bidding	0	0.0%	11	9.2%	59	49.6%	37	31.1%	12	10.1%	3.43	1
bid/no bid criteria of the firm	17	14.3%	66	55.5%	9	7.6%	17	14.3%	10	8.4%	2.53	3
bid decision models	80	67.2%	14	11.8%	8	6.7%	14	11.8%	3	2.5%	1.78	4
blind bidding	8	6.7%	27	22.7%	36	30.3%	44	37.0%	4	3.4%	3.08	2
Use of Historic Data												
use historic data as part of bid submission	1	0.8%	3	2.5%	47	39.5%	57	47.9%	11	9.2%	3.66	2
use price from previous tenders	0	0.0%	4	3.4%	15	12.6%	61	51.3%	39	32.8%	4.15	1
assess your success history before bidding	4	3.4%	77	64.7%	17	14.3%	14	11.8%	7	5.9%	2.58	3
Draft and Review Strategy												
check accuracy of issued Bills of Quantities	1	0.8%	3	2.5%	23	19.3%	51	42.9%	41	34.5%	4.08	2
check accuracy issued of drawings	4	3.4%	21	17.6%	48	40.3%	33	27.7%	13	10.9%	3.25	5
check the accuracy of issued tender document	0	0.0%	13	10.9%	41	34.5%	37	31.1%	28	23.5%	3.67	3
proof read the document before submission	4	3.4%	15	12.6%	30	25.2%	50	42.0%	20	16.8%	3.56	4
use attachment checklist for bid submission	1	0.8%	0	0.0%	15	12.6%	34	28.6%	69	58.0%	4.43	1
prepare draft document before final document	3	2.5%	53	44.5%	30	25.2%	22	18.5%	11	9.2%	2.87	6
Market Intelligence												
find client and financier information	0	0.0%	5	3.8%	36	27.5%	51	38.9%	39	29.8%	3.95	1
find information about other tenderers	0	0.0%	38	29.0%	49	37.4%	32	24.4%	12	9.2%	3.14	2

Variables	Not at all		Rarely		Average		Often		Very Often		Mean	Rank
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %		
look for market condition to prepare estimate	9	6.9%	31	23.7%	52	39.7%	26	19.8%	13	9.9%	3.02	3
Aggressive Bidding Strategy												
bid at zero profit	15	11.5%	88	67.2%	20	15.3%	6	4.6%	2	1.5%	2.18	1
bid below profit margin	52	39.7%	69	52.7%	8	6.1%	1	0.8%	1	0.8%	1.70	3
unbalanced bidding	45	34.4%	67	51.1%	15	11.5%	1	0.8%	3	2.3%	1.85	2
Bid Preparation Software												
bid decision software	85	64.9%	29	22.1%	11	8.4%	4	3.1%	2	1.5%	1.54	3
estimation software	11	8.4%	76	58.0%	39	29.8%	3	2.3%	2	1.5%	2.31	2
word processor software	8	6.1%	15	11.5%	37	28.2%	52	39.7%	19	14.5%	3.45	1
Teaming with Established Business												
joint venture	6	4.6%	27	20.6%	83	63.4%	13	9.9%	2	1.5%	2.83	1
partnership	7	5.3%	43	32.8%	71	54.2%	10	7.6%	0	0.0%	2.64	2
consortia	83	63.4%	38	29.0%	6	4.6%	3	2.3%	1	0.8%	1.48	4
strategic alliance	26	19.8%	70	53.4%	22	16.8%	12	9.2%	1	0.8%	2.18	3
Systematic Bidding Approach												
systematic Bidding procedure	1	0.8%	19	14.5%	48	36.6%	44	33.6%	19	14.5%	3.47	2
plan for bid preparation	0	0.0%	16	12.2%	25	19.1%	53	40.5%	37	28.2%	3.85	1
bid preparation framework	17	13.0%	33	25.2%	54	41.2%	17	13.0%	10	7.6%	2.77	4
select bid team with the manager	4	3.1%	32	24.4%	32	24.4%	45	34.4%	18	13.7%	3.31	3
Pricing Strategy												
cost based pricing (cost + markup)	0	0.0%	10	7.6%	14	10.7%	74	56.5%	33	25.2%	3.99	2
market based price	0	0.0%	9	6.9%	28	21.4%	67	51.1%	27	20.6%	3.85	3
standard rate table	25	19.1%	63	48.1%	21	16.0%	15	11.5%	7	5.3%	2.36	7
price from previous tender	0	0.0%	6	4.6%	24	18.3%	32	24.4%	69	52.7%	4.25	1
sub-contractor based price	14	10.7%	26	19.8%	30	22.9%	43	32.8%	18	13.7%	3.19	4
competition based price	4	3.1%	35	26.7%	49	37.4%	35	26.7%	8	6.1%	3.06	5
different mark up to different BOQ items	21	16.0%	58	44.3%	31	23.7%	18	13.7%	3	2.3%	2.42	6

APPENDIX II:

QUESTIONNAIRE SURVEY

QUESTIONNAIRE ON:

"ASSESSMENT OF CONTRACTORS' BIDDING STRATEGIES INFLUENCE ON TENDER SUCCESS RATE"

Questionnaires to Contractors (Quantity Surveyors/Estimators/Project Managers) I am currently undertaking a Master's of Science in Construction Economics and Management at Ardhi University. In fulfilment of this dissertation I am required to research a topic area stated above.

Objectives of the research

Main Objective

The main objective of this study is to assess how contractors' Bidding strategies influence tender success rate in competitive bidding.

- Please kindly answer the questions as appropriately as possible. I would be very grateful if you could complete this questionnaire and return it to the person who handled it to you.
- This survey is purely for academic purpose and all answers that you provide will not be disclosed and will be treated with utmost confidentiality. Identity will remain anonymous.

NAME: Temu, Joseph

MOBILE No: 0743790452

EMAIL: jeremytemu@gmail.com

SECTION 1: DEMOGRAPHIC INFORMATION

1. Firm's name (optional) …….
2. Your position in the Firm

☐ Quantity Surveyor

☐ Estimator

☐ Procurement Officer

☐ Architect

☐ Engineer

☐ Project Managers

☐ Any other (please specify) ……..

3. Education qualification

   ☐ PhD

   ☐ Master's Degree

   ☐ Bachelor's Degree

   ☐ Diploma

   ☐ Certificate

4. Contractor's class as registered by Construction Registration Board (CRB)

   Class 4 ☐ Class 5 ☐ Class 6 ☐ Class 7 ☐

5. For how long has the company been in business

   Less than 1 Year ☐ 1-5 Years ☐ 6-10 Years ☐ Over 10 Years ☐

6. How long have you been working in construction industry

   Less than 1 Year ☐ 1-5 Years ☐ 6-10 Years ☐ Over 10 Years ☐

SECTION 2: CONTRACTORS BIDDING STRATEGIES

7. To what extent are bidding strategies listed below used in bidding for building works? Please rank according to your view, Mark √ in appropriate column. 5-Very Frequent, 4-Frequent, 3-Average, 2-Rarely and 1-Not at all

SN	BIDDING STRATEGIES	LIKERT SCALE				
		5	4	3	2	1
		Very Often	Often	Average	Rarely	Not at all
1	**Focused strategic Bidding**					
	How often do you make bid/no bid decision before bidding					
	Do you review bid/no bid criteria of the firm					
	How often do you use bid decision models					
	How often do you bid for works without prior assessment					
2	**Use of Historic Data**					
	How often do you use historic data as part of bid submission					
	How often do you use price from previous tenders					
	How often do you assess your success history before bidding					
3	**Draft and Review Strategy**					
	How often do you check accuracy of issued Bills of Quantities					
	How often do you check accuracy issued of drawings					
	How often do you check the accuracy of issued tender					
	How often do you proof read the document before submission					
	Do you always use attachment checklist for bid submission					
	Do you always prepare draft document before final document					
4	**Market Intelligence**					

SN	BIDDING STRATEGIES	LIKERT SCALE				
		5	4	3	2	1
		Very Often	Often	Average	Rarely	Not at all
	How often you find client and financier information					
	How often do you find information about other tenderers					
	How often do you look for market condition to prepare estimate					
5	**Aggressive Bidding Strategy**					
	How often do you bid at zero profit					
	How often do you bid below profit margin (at negative profit)					
	How often do you use unbalanced bidding					
6	**Use of bid preparation software**					
	How often do you use bid decision software					
	How often do you use estimation software					
	How often do you use word processor software					
7	**Teaming up with established business**					
	How often do you form joint venture					
	How often do you form partnership					
	How often do you form consortia					
	How often do you form strategic alliance					
8	**Systematic Bidding approach Strategy**					
	How often do you follow systematic Bidding procedure					
	How often do you make plan for bid preparation					
	How often do you follow bid preparation framework					
	How often do you select bid team with the manager to					
19	**Pricing Strategy**					
	How often do you use cost based pricing (cost + mark-up)					
	How often do you use market based price					
	How often do you use standard rate table					
	How often do you use price from previous tender					
	How often do you use sub-contractor based price					
	How often do you use competition based price					
	How often do you assign different mark up to different BOQ					

SECTION 3: MEASURES OF CONTRACTOR'S BID SUCCESS RATE

8. How many projects have you tendered for the past three years: ……

9. How many projects have you won for the past three years: ……

THANK YOU FOR YOUR TIME