THE DETERMINANTS OF CONTRACTOR SELECTION PROCESS AND PERFORMANCE OF CONSTRUCTION PROJECTS IN TANZANIA: A CASE OF INSTITUTE OF ACCOUNTANCY ARUSHA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF BUSINESS ADMINISTRATION IN TRANSPORT AND LOGISTICS MANAGEMENT (MBA-TLM)

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CERTIFICATION

The undersigned certifies that he has read and here by recommends for acceptance by The Open University of Tanzania a dissertation entitled: **"The determinants of contractor selection process and performance of construction projects in Tanzania: A case of Institute of Accountancy Arusha"**. In partial fulfilment of the requirements for the award of Degree of Masters of Business Administration in Transport and Logistics Management (MBA-TLM) of the Open University of Tanzania.

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Date

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DECLARATION

I, **Mordecai Chrysostom Matto,** declare that, the work presented in this proposal is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfilment of the requirements for the Degree of Masters of Business Administration in Transport and Logistics Management.

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Signature

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Date

DEDICATION

This dissertation is dedicated to my beloved father, the late Mr. Chrysostom Magambo Matto.

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This research project is an output of combined efforts from a multitude. Above all, I am so grateful to my Almighty Jehovah God, the Most Benevolent, for giving me life to complete my study.

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ABSTRACT

The success or failure of construction projects fundamentally depends on the contractor's performance. Hence, this study examined the determinants of the contractor selection process and the performance of construction projects in Tanzania. The specific objectives were confined to the standard contractor selection indicators namely commercial examination, technical examination and financial examination. To meet the study objectives, the agency theory was adopted to guide the study. Likewise, the study deployed a quantitative research approach and explanatory design in data collection and analysis. The data were collected from 205 respondents using a questionnaire and documentary review. The sampled respondents of this study were selected using stratified random sampling. The analysis of the data was performed using partial least squares structural equation modelling with the help of SmartPLS 3 software. The findings showed that technical examination and financial examination are significantly associated with performance of construction projects and both mediate the relationship between commercial examination of tenders and the performance of construction projects. Theoretically, results demonstrated that deficiencies in commercial, technical and financial examinations can lead to moral hazard, adverse selection, and signalling. The study recommended that policymakers to integrate the contractor selection process and the performance of construction projects. Similarly, procuring entities should ensure that the contractor selection criteria are adequately prepared. Finally, the study concluded that contractor selection attributes predict performance of construction projects.

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LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
ANOVA	Analysis of Variance
AVE	Average Variance Extracted
BOQs	Bill of Quantities
CB-SEM	covariance-based SEM
CET	Commercial Examination of Tenders
DC	District Council
EU	European Union
FET	Financial Examination of Tenders
GDP	Gross domestic product
GPSA	Government Procurement Services Agency
HEET	Higher Education for Economic Transformation
HOC	Higher-order construct or higher-order component
HTMT	Heterotrait-Monotrait
IAA	Institute of Accountancy Arusha
KMO	Kaiser-Meyer-Olkin
LGAs	Local Government Authorities
LOC	Lower-order construct or Lower-order component
NAOT	National Audit Office of Tanzania
PCP	Performance of Construction Projects
PLS-SEM	Partial Least Squares - Structural Equation Modelling
PPRA	Public Procurement Regulatory Authority
SEM	Structural Equation Modelling

TET	Technical Examination of Tenders
USD	United States Dollar
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Chapter overview

This chapter presents a background to the problem that synthesizes three levels namely historical, interventions, and empirical for contractor selection process and construction projects. It then presents the statement of the research problem, the general objective, specific objectives, and hypotheses of the study. Finally, it highlights the significance of the proposed study.

1.2 Background to the Problem

The success of construction projects has become a fundamental goal of most procuring organizations (Hajek et al., 2017). This is because most construction projects require a large capital expenditure and this draws attention to ensure that the expected performance is achieved. The performance of construction projects is assessed throughout the project cycle (Gunduz & Elsherbeny, 2020). According to Hajek et al. (2017), the selected contractor/supplier/service provider has a fundamental influence on the quality of this performance. In line with this recognition, the Principal-agent theory suggests that an adverse selection (e.g. contractor) could result in an agency problem (Ismail et al., 2021). According to Fayezi et al. (2012), the adverse selection entails the selected contractor is not capable of completing the project on scope, time and cost at the required quality level.

The construction industry has been the main contributor to the Gross domestic product (GDP) in developed and developing economies. In the European Union

(EU), the construction sector accounts for about 3.5% of the GDP, and 6% of the EU's employees have been employed in this sector (Baker et al., 2017). In Ethiopia, the construction industry accounts for 8.5% of the GDP (Baker et al., 2017). Likewise, in Egypt, construction is considered the fastest-growing sector but the performance of most projects is undesirable (Marzouk & Gaid, 2018). In Tanzania, the construction sector contributes about 10.1% to the GDP in 2022 or United States Dollar (USD) 6.7 billion in 2018 higher than USD 4 billion generated in 2014 (Tanzania Invest, 2023). Furthermore, the volume of contracts for construction for the financial year 2021/2022 was TZS 8,254.90 billion equivalent to 84% of the total contract value awarded for implementation of various construction projects (PPRA, 2022). The growth of the construction sector in Tanzania has been attributed to the completed and ongoing projects on the construction of airports, sea and inland ports, standard gauge railways, roads, bridges, and other related projects (Tanzania Invest, 2023).

The shortcomings of contractor's performance in construction projects have been documented in the literature. In the United Kingdom, the contractor's performance was linked to the post-contract activities (Lam, 2022). In India, Prakash et al. (2023) identify nine major criteria for successful contractor selection where special attention is given to productivity, innovation, flexibility and deliverability. Conversely, little attention was given to linking the identified criteria with project performance.

Similarly, in Nigeria (Okpo et al., 2023), South Africa (Amoah & Pretorius, 2020) and Ethiopia (Gadisa & Zhou, 2021), contractor performance was linked to the

contract implementation stage and numerous shortcomings were identified. In Malaysia, Ismail et al. (2021) established contractor selection criteria and weightings. Most of the criteria were grouped in commercial, technical and financial aspects of tender evaluation but the identified criteria were not linked to the project performance.

Likewise, the inefficient contractor selection process in Tanzania was revealed by Dello and Yoshida (2017), however, the study did not indicate the extent to which it affected the project performance. Another similar study documented by Matto et al. (2021) reveals that tender evaluation aspects enhance best value for money in public sector procurement, however, the study was not confined to construction projects. Further, the study relates technical and financial aspects and value for money. Therefore, those studies relate the performance of construction projects with either contract administration activities or post-contract activities. However, limited studies tried to link the performance of construction projects and pre-contract activities such as contractor selection.

Once contractor's proposals (tenders) are received manually or electronically, evaluation teams are formed to assess the most economically advantageous tender. The selection process is carried out in stages such as commercial, technical and financial (PPRA, 2020). In other words, the selection process of tenders considers both technical and economic standards (Zhang et al., 2015). A contractor who fails to meet the minimum set criteria in the first stage is outright rejected and no further assessment is done for the subsequent stages. Financial examination of tenders is

carried out for those tenders which are commercially and technically responsive. Then, the lowest evaluated contractor is obtained following compliance with all set criteria. That's why Prakash et al. (2023) suggest that the purchaser should be capable of administering the contractor selection process.

Despite different researchers putting the contractor selection process in different frameworks, very few tried to link the same with the performance of construction projects. Therefore, this study investigates the determinants of contractor selection process and performance of construction projects.

1.3 Statement of the problem

The success or failure of construction projects fundamentally depends on the contractor's performance (Amoah & Pretorius, 2020; Hajek et al., 2017). Most project failures are connected to risks which were not considered in the tendering stage (Ismail et al., 2021). For instance, previous studies report that several projects fail because of incompetent contractors, subcontractors and consultants in terms of inadequate financial resources (Adebisi et al., 2018), lack of relevant expertise and experience, (Nguyen & Chileshe, 2015), weak in human resources, equipment and technology (Amoah & Pretorius, 2020). More importantly, the Tanzania Controller and Auditor report various shortfalls in construction projects. For instance, contracts given to unregistered contractors (TZS 12.8 billion) and failure to undertake due diligence resulted in a price increase of TZS 7.41 billion (NAOT, 2023c). Likewise, awarding a maintenance contract to a low-capacity contractor leads to abandoned projects, and 33% of audited projects take longer to complete (NAOT, 2022). Also,

the insufficient oversight of the contractor selection process and the contractor's default because they lack the necessary tools and manpower were reported (NAOT, 2019).

The existing literature in Tanzania has reported that, the performance of construction projects is not satisfactory (Chileshe et al., 2020; Dello & Yoshida, 2017; Rasheli, 2016). Most of them cited among other reasons for project failure were those related to contractor selection. Contractor selection in public procurement in Tanzania is carried out in three stages namely commercial, technical and financial examination (PPRA, 2020). Each stage comprises several criteria and sub-criteria which are to be considered by the tender evaluation team.

Most writers link the performance of construction projects with contract administration activities (Amoah & Pretorius, 2020; Okpo et al., 2023), however, few of them tried to link the performance of construction projects with selection process. Failures to link them, organizations end up with unsatisfactory project performance. The principal-agent theory reveals a significant connection between adverse selection and project performance, which makes it impossible to dismiss the need for more research into the relationship between contractor selection and project performance (Ceric, 2012; Corvellec & Macheridis, 2010). Hence, this study links the two concepts to enlighten knowledge and ensure that the best performance is achieved in construction projects.

1.4 Objectives

1.4.1 General Objective

The study examined the determinants of the contractor selection process and the performance of construction projects in Tanzania.

1.4.2 Specific Objectives

The study was guided by the following specific objectives:

i. To examine the effect of technical examination of tenders on the performance of construction projects,
ii. To examine the effect of financial examination of tenders on the performance of construction projects.
iii. To examine the mediating effect of technical examination of tenders on commercial examination of tenders and performance of construction projects, and
iv. To examine the mediating effect of financial examination of tenders on commercial examination of tenders and performance of construction projects.

1.5 Research Hypotheses

This study aimed to test the following hypotheses:

i. H1: Technical examination of tenders is positively related to the performance of construction projects;
ii. H2: Financial examination of tenders is positively related to the performance of construction projects;

iii. H3: Technical examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects;

iv. H4: Financial examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects;

1.6 Significance of the Study

The current study brought significance to the existing knowledge, policy implications and managerial practices. *First,* significance to the knowledge was achieved by establishing a relationship between contractor selection indicators and the performance of construction projects. Furthermore, the mediating role of a technical and financial examination of tenders on commercial examination of tenders and the performance of construction projects was also established. *Second*, the study enriched the principal-agent theory by relating moral hazard, adverse selection, and signalling and performance of construction projects. *Third,* on policy implication, the study provided inputs to the construction policy and procurement regulations. *Finally,* regarding managerial practices, the performance of procuring entities could be enhanced by integrating the contractor selection process with the performance of their current and future projects.

1.7 Scope of the Study

The scope of the study covered the determinants of the contractor selection process and the performance of construction projects. The study identifies commercial

examination, technical examination and financial examination as independent variables while the performance of construction projects as the dependent variable. Besides, technical examination and financial examination were also identified as mediating variables. The variables were selected because they are used to evaluate the capability of contractors/suppliers/service providers in the public procurement context (PPRA, 2022). The study was carried out at the Institute of Accountancy Arusha due to the fact that there are several completed and ongoing construction projects.

1.8 Organization of the Dissertation

This dissertation encompasses six chapters. The first chapter presents a background to the problem, a statement of the research problem, the general objective, specific objectives, and hypotheses of the study. Finally, it highlights the scope and significance of the proposed study.

The second chapter narrates the review of relevant theoretical and empirical literature on contractor selection process and performance of construction projects. First, the key concepts of the study are defined followed by a theoretical and empirical review of literature. Finally, the chapter winds up with a research gap and conceptual framework that presents diagrammatically the relationship among variables.

The third chapter describes the research techniques and procedures adopted in this study. It begins by outlining a description of the philosophical position, research approach and design. Thereafter, an explanation of the research area, population,

sample size, and data collection methods follow. The operationalization of variables, data collection procedure, analytical approach, and validity and reliability of the study are all then further described. The chapter concludes with an explanation of research ethical issues.

The fourth chapter begins by presenting the characteristics of the demographic profile of the respondents and the descriptive profile of the examined variables. The results of the measurement model and structural model are also presented. Finally, the chapter summarizes the results of hypothesis testing.

The fifth chapter discusses the outcomes of the data analyses carried out and is presented in chapter four. The discussion is split into three sections, namely managerial discussion and theoretical discussion.

The sixth chapter presents a conclusion, contribution, recommendations, and suggestions for future research. It begins by narrating a conclusion based on the research objective. Then it proceeds to enumerate the contributions based on empirical, theoretical, policy and managerial aspects. Lastly, the recommendations for future studies are offered.

CHAPTER TWO

LITERATURE REVIEW

2.1 Chapter Overview

This chapter narrates the review of relevant theoretical and empirical literature on contractor selection process and performance of construction projects. First, the key concepts of the study are defined followed by a theoretical and empirical review of literature. The theoretical review is grounded in the Principal-agent theory and the empirical literature is presented using the chronological approach. Finally, the chapter winds up with a research gap and conceptual framework that presents diagrammatically the relationship among variables.

2.2 Conceptual Definitions

2.2.1 Tender

In most contexts including Tanzania, the term tender is also referred to as a bid. According to URT (2011), a tender or bid is an offer, quotation or proposal made by a contractor, supplier or consultant in response to a request by a procuring organization. Fuelling this demand, Ismail et al. (2021) relate tender with an offer whereas Zhang et al. (2015) relate tender with a quoted price. Therefore, in this study, a definition put forward by the URT (2011) was opted because it is standard and can be used in various contexts. Besides, the terms tender and bid are used interchangeably in the proposed study.

2.2.2 Contractor Selection

The process of assessing and deciding which contractor is capable of executing the

contract (Matto et al., 2021). Silva and Figueiredo (2018) view contractor selection as an intensive search for information and describing the criteria, sub-criteria, and appropriate assessment method. Abdullahi *et al.* (2020) narrate a tender evaluation system with an assessment method. Other studies coined the contract/supplier selection process as a multi-criteria decision problem and are considered the most substantial in project implementation. In explaining contractor selection process, the study used the definitions put forward by Silva and Figueiredo (2018); and Matto et al. (2021) due to their coverage.

According to Hajek et al. (2017) and Ismail et al. (2021), contractors are evaluated in terms of commercial, technical and financial aspects. They also narrate that, commercial/technical/financial examinations refer to the examination of commercial/technical/financial characteristics of a tender submitted by a bidder to respond to a procurement opportunity floated by a procuring entity.

Commercial examination of tender focuses on shortcomings, which if accepted, would provide unfair advantages to the bidder (World Bank, 2016). According to PPRA (2020), commercial examination involves the assessment of the basic aspects of tender namely verification, eligibility, bid securities and completeness. Technical examination is an assessment aimed at determining whether the bid is substantially responsive to the technical requirements in terms of financial situation, contract conditions, experience, and resource capability (World Bank, 2016). In the financial examination, bids are assessed against criteria such as corrections of arithmetical errors, conversion into a single currency, price deviations and rank (PPRA, 2020).

2.2.3 Performance of Construction Projects

Numerous studies on the performance of construction projects have been documented in the literature. The elucidations of performance were based on quality, cost and time parameters. Gadisa and Zhou (2021) measure project performance in terms of cost overrun, schedule overrun, project quality, customer satisfaction, user and stakeholder participation, and Health and safety issues. Besides, project success was assessed by Amoah and Pretorius (2020) in terms of schedule, quality, budget, health, safety and environment. Likewise Marzouk and Gaid (2018) use cost, time, safety and quality performance, productivity and client satisfaction as the key performance indicators to measure project performance in the construction sector. Most of these indicators were also used to assess project failures (Adebisi et al., 2018; Damoah & Akwei, 2017). Therefore, in this study performance of construction projects is confined to the following parameters namely time, quality, cost, complaints, procurement objectives, customer satisfaction, market price and public interest. Furthermore, construction projects in this study are used to refer to the works linked to the construction, reconstruction, demolition, repair or renovation of a building.

2.3 Theoretical Literature Review

The proposed study was guided by the Principal-agent theory. This theory originates from the contract theory (Andersen et al., 2008) and enlightened the way contracts are formed in a condition where one party holds more information than the other. The application of the theory in construction projects is widespread (Ceric, 2012; Owusu-Manu et al., 2018). Under this theory, one party (the agent) is contracted to

undertake a particular task on behalf of another party (the principal) and is delegated some decision-making authority (Roach, 2016). However, according to this theory, the principal knows less about the delegated tasks than the agent i.e. asymmetry of information (Owusu-Manu et al., 2018). In due course, the agent will try to maximize his or her benefit at the expense of the principal. This creates an agency problem and increases agency costs (Chrisidu-budnik & Przedańska, 2017).

The agency problem is contributed by adverse selection and moral hazard (Liu et al., 2011). Signalling has recently been listed as one of the factors by academics (Adebisi et al., 2020). According to Chrisidu-budnik and Przedańska (2017), adverse selection entails that the responsive bidder is not the most efficient in performing the delegated task. Likewise, moral hazard involves opportunistic behaviours where the agent takes advantage for personal gain at the expense of the principal (Owusu-Manu et al., 2018). In several cases, moral hazard is observed in contract implementation where a contractor uses inferior materials, tempering with agreed technical specifications and standards, uses key personnel with less expertise than those indicated in the tender process, and uses substandard equipment and tools.

The Principal-agent theory was relevant to this study. In the construction sector, a principal (a personal, project owner or organization) and agent (contractor - a person or organization) form the key contractual relationship. A procuring organization that receives and evaluates tenders and proposals is the principal whereas a contractor, supplier or service provider is the agent. The adverse selection could arise when there is a weak selection process or members of the evaluation team are not capable

of assessing the contractor's bid. This resulted in the employment of unqualified and/or unethical contractors. More importantly, the outcome of adverse selection and moral hazard has been indicated by extant literature. It includes building collapse, sub-standards performance, project delay, cost-inefficiency and project abandonment (Keil, 2005; Yukins, 2010; Zu & Kaynak, 2012). To avoid engaging unqualified agents, Keil (2005) proposes an efficient screening process, verification of contractor's data by an independent authority and signalling (certifications, authorized dealer etc.).

To minimize risks that arise from adverse selection and moral hazard, many writers have proposed the principal to institute a strong monitoring mechanism (Ceric, 2012; Parker et al., 2018; Roach, 2016; Zu & Kaynak, 2012). However, this mechanism is applied during contract administration. Based on the reviewed studies, none of them has proposed mechanisms related to contract formation and explicitly linked to the performance of construction projects. Nevertheless, Yukins (2010) concludes that the principal-agent theory is applied in both contract formation and contract administration. Since numerous studies have attempted to explain the rationale of an efficient contractor selection process and the performance of projects, risks arising from adverse selection and moral hazard could also be mitigated through an efficient contractor selection process. Therefore, this study filled the gap by examining the determinants of the contractor selection process and the performance of construction projects.

The theory is challenged by a generalization of its assumptions including the idea that contractual relationship is influenced by individualism and opportunism, the monitoring mechanism instituted by the principal, and the notion of information asymmetry which accelerates opportunistic behaviours (Parker et al., 2018). However, its contributions to construction projects have never been confronted.

2.4 Empirical Literature Review

The study used the chronological approach to review the literature. This approach requires a researcher to review a study-by-study or one study after the other (Saunders et al., 2019). This approach was relevant because few writers have linked the tender process and performance of construction projects specifically in the Tanzania context.

2.4.1 Commercial examination of tenders and performance of construction projects

Ismail et al. (2021) investigated tender evaluation criteria and weightings in private-sector construction projects in Malaysia. The data were analyzed using descriptive parameters such as mean, percentage, summation and ratio. The study finds that the evaluation of tender in private clients has been conducted in two main stages: a technical evaluation stage and a commercial evaluation stage. Despite the valuable insight made by this study on the actual criteria used during tender evaluation practice, the identified selection stage and criteria were not linked with project performance. Therefore, there is a need to examine whether the identified evaluation criteria have a significant impact on the project performance.

Marcarelli and Nappi (2019) documented a study on the multi-criteria approach to select the most economically advantageous tender in Italian public procurement using the analytic hierarchy process (AHP) model. The data were analyzed using basic descriptive elements namely min, max, sum and coefficient. The model assimilates multiple quantitative and qualitative criteria, streamlines the selection process, attains optimal use of resources and ultimately leads to cost savings. However, the study did not link the model with construction project performance.

Matto et al. (2021) examined the tender process and value for money in public sector procurement in Tanzania. The analysis of data was undertaken using descriptive statistics (mean, mode, variance, standard deviation, skewness and kurtosis) and inferential statistics (regression analysis & ANOVA). The findings show that tender evaluation was among the significant factors that enhance value for money in public procurement. The evaluation process namely technical, commercial and financial was detailed discussed. The study concludes that procuring entities in Tanzania need to put more effort into administering proper tender evaluation (among others) to achieve the best outcome. Nevertheless, the study was confined to the tender process rather than the tender evaluation or selection process.

2.4.2 Technical examination of tenders and performance of construction projects

The study documented by Amoah and Pretorius (2020) investigated the influence of project risk management on the project performance of small construction companies in South Africa. The data were analyzed using the content analysis method and Excel

analytical tool. The study identified major risk conditions that triggered project failures namely main contractor and subcontractor-related issues, labour-related issues, and payment delays. However, the study did not provide a firm conclusion on the influence of risk management on project deliverables because it used qualitative methods and the lack of a theoretical foundation raises doubts about the data' generalizability.

A study related to project failure and abandonment of multi-storey buildings was documented by Adebisi et al. (2018) in Nigeria. Frequency distribution, mean, percentages and factor analysis were used to analyze the data. Among the significant factors for the failure and abandonment of building projects were bankruptcy or business failure of the contractor, inappropriate scheduling of the project activities and engaging unqualified professionals. Despite the contribution made the study was restricted to a single variable (project failure) which cannot adequately explore the performance of construction projects.

Damoah and Akwei (2017) conducted a study using a multidimensional approach to government project failure in Ghana. The study established six failure criteria namely meeting the projected timescale, stakeholder satisfaction, requirement, cost, national development and contribution to the project sector. However, a study restricted to a single variable (project failure) cannot adequately explore the construction project performance.

Likewise, another similar study was documented by Nguyen and Chileshe (2015) who revisited the reasons causing construction project failure in Vietnam. The study

identified factors for project failure as follows: inadequate project planning, the poor performance of contractors, poor design capacity and numerous changes, insufficient experience, corruption, and financial constraints. Nevertheless, the study is constrained to a single variable (project failure) which cannot adequately explore the construction project performance.

Chileshe *et al.* (2020) documented a study on challenges affecting the bid decisions of local building contractors in Tanzania. The data were analyzed using descriptive statistics, inferential (one sample t-tests) and correlation analysis. The study identifies the five most critical challenges related to liquidity, equipment, experience, profit returns and procurement procedures. Based on the study results, four out of five identified challenges are detected during the evaluation of bids and appropriate action is to be taken before awarding the contract. Awarding the contract to the bidder with the identified issues could adversely affect the performance of the project. Subsequently, the study did not relate the bid evaluation and project performance, the present study intends to fill the gap.

A study documented by Matto (2023) identifies the latent Shortcomings of construction projects implemented under the force account approach in Tanzania education sector. The study used an explanatory sequential mixed method where the evidence was collected from twenty-two (22) force account construction projects. The study identified 6 and 21 general latent shortcomings and detailed latent shortcomings respectively. Among the identified general shortcomings were inappropriate adherence to the procurement procedures for materials (selection process inclusive); lack of qualified personnel to execute and supervise the works;

and lack of appropriate equipment and tools. Despite its contributions, the study was confined to projects implemented under the force account method only.

2.4.3 Financial examination of tenders and performance of construction projects

A study conducted by Lundberg and Bergman (2017) analyzed the way public authorities select the lowest price and more complex scoring rules in design supplier selection in Sweden. The regression analysis was adopted in data analysis. Based on 5 hypotheses, the study findings show that more complex scoring rules are required when the authority is uncertain about costs and quality. However, when there is significant cost uncertainty, the study proposes the use of the economically most advantageous tender approach. However, the study's interest was price and quality and gave little attention to commercial aspects of tender evaluation and its effect on the performance of the projects.

Mukherjee (2016) conducted a study on supplier selection criteria and methods in India. The descriptive analysis (frequency, sum, skewness, kurtosis) of data was carried out using the software 'R' aimed at having a better insight into the trend of research. The results showed that several articles in supplier evaluation and selection used multi-criteria decision analysis tools. However, the tool is not appropriate for all types of uncertainties because of subjectivity and context. Despite the significant contribution made by this article, it confined to the manufacturing firms and did not link the selection criteria with the performance of construction projects.

Dello and Yoshida (2017) carried out a study about online tendering and evaluation for public procurement in Tanzania. Using multiple regression analysis, the study

revealed that the major problem in the current procurement process is the inefficient bidding and selection process. The propositions were confirmed and concluded that an efficient procurement system including e-evaluation can reduce cost and time and reduce corruption in public procurement. Despite the contribution of the study on the role of electronic in bidder selection, it focuses more on the system rather than the process used to evaluate bidders.

2.5 Research Gap

The success and failure of construction projects have been documented in extant literature (Al-Yahya & Panuwatwanich, 2018; Khan & Hosany, 2016). The performance of construction projects in Tanzania has not been exciting due to several observed shortcomings. Most of the identified shortcomings were mainly related to failure to meet the delivery schedule, cost increase, inadequate quality, and failure to meet project objectives (Chileshe et al., 2020; Matto, 2023; Rasheli, 2016). However, most of these shortcomings were assessed during contract administration activities and then were linked to the performance of construction projects. Based on this view, the review of the literature shows that several studies relate to the performance of construction projects and contract administration activities while others relate to post-contract activities. However, few studies have tried to link the performance of construction projects and contract formation activities such as contractor selection. The present study filled this gap and enriched the literature in the context of Tanzania using principal-agent theory and a quantitative research approach.

2.6 The Conceptual Framework

The conceptual framework presented in Figure 2.1 below guided this study. The framework shows that the conceptual framework of the proposed study is grounded in three constructs emanating from the standard contractor selection criteria which are used to examine the contractor's offer in public procurement. These constructs are commercial examination, technical examination and financial examination. The performance of construction projects construct is influenced by technical examination and financial examination of tenders. Furthermore, technical examination and financial examination of tenders are also influenced by commercial examination.

Thus, the commercial examination construct was assessed using four (4) items, the technical examination construct was assessed using four (4) items and the financial examination construct was assessed using two (2) items. Due to the complexity of the framework, the measured items for independent and moderation variables were operationalized using "the higher-order and Low-order constructs" technique (Sharma et al., 2022). The performance of construction projects construct was assessed using eight (8) items. Therefore, the commercial examination is the independent variable, the technical examination and financial examination of tenders are meditating variables, and the performance of construction projects is the dependent variable.

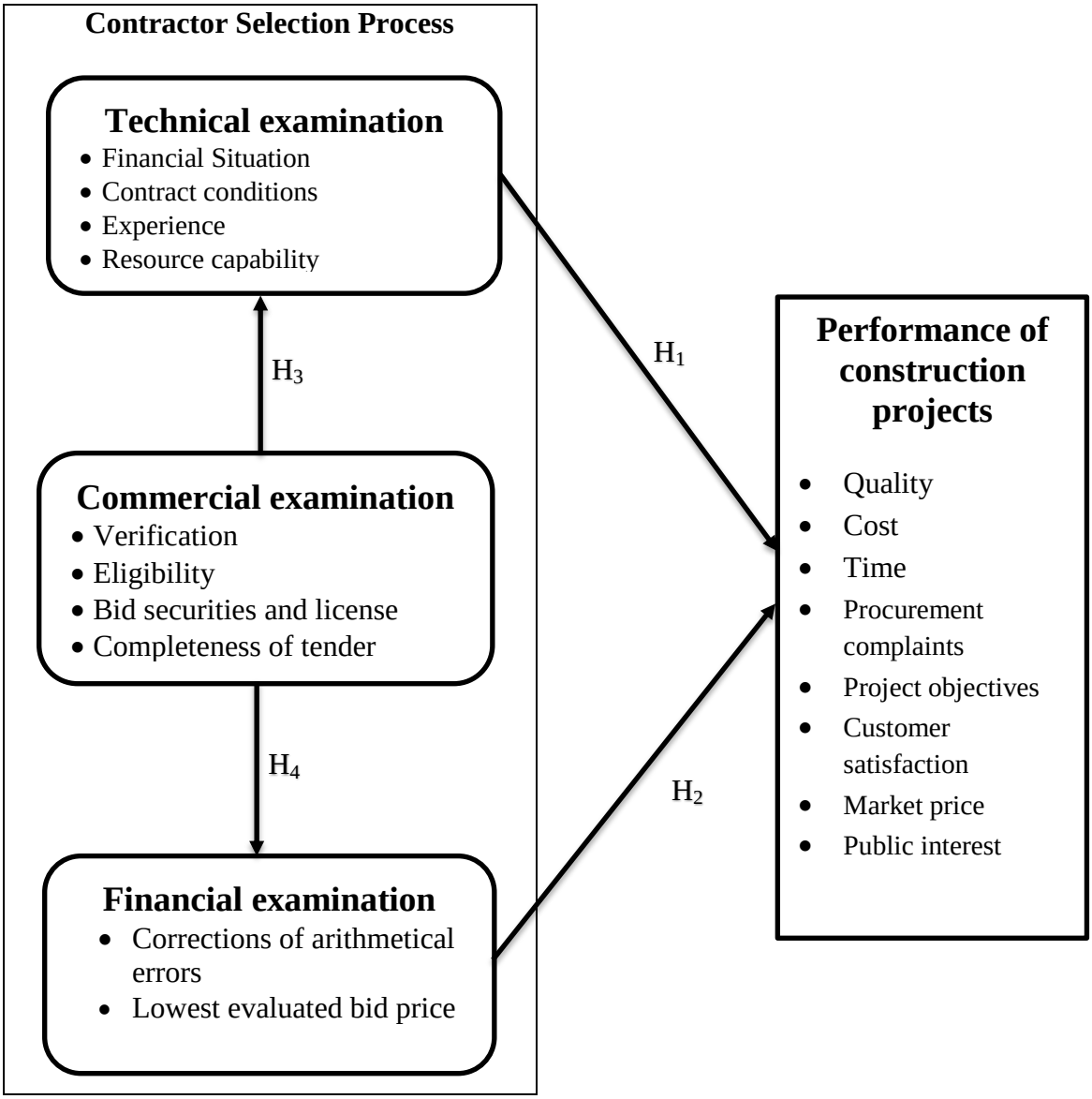


Figure 2. 1 Conceptual Framework

Source: Adopted and modified from the standard contractor selection indicators used in public procurement and international organizations, 2024

CHAPTER THREE

METHODOLOGY

3.1 Chapter Overview

This chapter describes the research techniques and procedures adopted in this study. It begins by outlining a description of the philosophical position, research approach and design. Thereafter, an explanation of the research area, population, sample size, and data collection methods follow. The operationalization of variables, data collection procedure, analytical approach, and validity and reliability of the study are all then further described. The chapter concludes with an explanation of research ethical issues.

3.2 Research Philosophy

Most studies explain research philosophy in terms of beliefs tied with assumptions in the production of knowledge (Gannon et al., 2022). The study adopted a positivism research philosophy. This philosophy suggests that the researcher's own beliefs have no value in influencing the study (Saunders et al., 2019). Using this philosophy, researchers claim to be external to the process of data collection and analysis (Johnston, 2014). The positivism philosophical attitude facilitated the examination of the relationship between the contractor selection process and the performance of construction projects. Furthermore, the mediation effect of technical examination and financial examination of tenders on commercial examination and performance of construction projects were assessed. According to Amaratunga et al (2002), a positivism philosophy requires the use of theory to develop hypotheses. This condition was satisfied because the study is grounded in the principal-agent theory.

3.3 Research Approach

The research approach is described as the techniques used by researchers to solve a research problem (Creswell, 2023). These techniques are classified into three major groups namely qualitative, quantitative, and mixed methods. The study adopted the quantitative research approach in the stage of data collection and analysis. The quantitative approach emphasizes numbers that represent concepts or opinions (Azer et al., 2022). Therefore, this approach was used to examine the influence of contractor selection process on the performance of construction projects. Besides, the moderating effect of technical examination and financial examination of tenders on commercial examination and performance of construction projects was computed. In this study, quantitative data were collected using questionnaires and documentary reviews.

3.4 Research Design

Research design entails the overall plan of how the researcher is going to answer research questions or achieve the research objectives (Saunders et al., 2019). To meet the study objective, an explanatory design was adopted for collecting, analyzing and reporting research findings. This design allows the researcher to examine the relationship between contractor selection process and the performance of construction projects. Besides, the study findings were solely based on the experience of practitioners in construction projects collected at one point in time, therefore descriptive cross-sectional survey was also adopted.

3.5 Study Area

The study was conducted to address the problems facing the performance of construction projects in the public sector in Tanzania. Therefore, the study was conducted at the Institute of Accountancy Arusha (IAA). The IAA is appropriate due to the following reasons: first, for the past three consecutive years, IAA has been implementing nine construction projects in Arusha, Babati, and Dodoma campuses. Besides, during the financial year 2023-2024, IAA received TZS 44 billion through the Higher Education for Economic Transformation (HEET) project where 90% of the funds planned to be used for the construction of Songea Campus and expansion of Arusha and Babati Campus (Rector-IAA, 2023). This shows that the Institute has adequate experience in screening and selecting contractors for construction activities. Therefore, IAA fits the study environment and enables it to meet the research purpose.

3.6 Sampling Design

3.6.1 Population of the study

This study collected practitioners' opinions based on their experience in contractor selection process and construction projects. For this, the target population of the study was members of user departments that execute construction projects. The selection of user departments was based on their role in participating in the evaluation process. Based on section 39 of the Public Procurement Act, CAP 410, the main function of user departments is to manage contract performance. Thus, members of user departments have adequate knowledge of the contractor selection process and performance of construction projects. Currently, IAA constitutes 428

members of user departments involved directly or indirectly in the tender process (Rector-IAA, 2023).

3.6.2 Sample Size of the Study

The sample size is computed using Yamane's formula (Yamane, 1967) as

$n = N/(1+N(e^2))$;

Where:

n = sample size;

N = total population (N=428); and

e = error of tolerance (e = 0.05);

$n = 428 / (1+434(0.05^2)$;

n = 428 / (1+434(0.0025);

n = 428 / (2.085); n = 205;

Thus, the sample size (n) was 205

The 205-sample size is sufficient based on the data analysis technique adopted in this study. The data analysis technique was structural equation modelling (SEM). The use of SEM requires a minimum required sample size for the results to be meaningful. Previous researchers have proposed N=100 to be the minimum sample size (Randhawa & Ahuja, 2017) and N=200 to be the ideal sample size (Chansatitporn & Pobkeeree, 2020). Therefore, the sample size of 205 was appropriate because it is above the minimum sample size (N = 100) and ideal (N = 200) sample size proposed by previous studies.

3.6.3 Sampling Procedure

The sampled population of this study was selected using stratified random sampling. The population was selected based on the Institute's campuses namely Arusha, Babati, Dar es salaam, Dodoma, and Songea. Besides, key respondents from each campus were selected using simple random sampling. This technique ensures that each entity (campus) has an equal chance of being selected from the population and being representative of the population (Creswell, 2012).

3.7 Data Collection

The data for the current study was collected by using questionnaires and documentary review.

3.7.1 Questionnaire

The questionnaire survey was used to collect quantitative data. The questionnaire survey comprised close-ended questions and was distributed to the members of user departments. In this study, a self-administered online questionnaire was used for data collection. The online questionnaire was created using the google form and the link was sent to the respondent. The questionnaire survey was designed into two sections. Section "A" includes the demographic questions whereas section "B" includes questions related to the study constructs namely commercial, technical and financial examination of tenders and performance of construction projects. Correspondingly, the questionnaire survey was designed for a 5-point Likert scale with an ordinal ranking where:-

1 = Strongly Disagree,

2 = Disagree,

3 = Neutral,

4 = Agree and

5 = Strongly Agree.

The sample of the draft questionnaire is attached as Appendix 1.

3.7.2 Documentary Review

The documentary review method involved various written documents related to the study objectives. This method was used to collect quantitative data. The primary objective of the data obtained from the documentary review was to support information obtained from the questionnaire. The data were collected from annual performance reports issued by PPRA, compliance and performance audit reports issued by NAOT, guidelines for tender evaluations issued by oversight bodies, and previous journal articles on construction projects.

3.8 Variables and Measurements

The study constructs were operationalized by using measured items adopted from the standard contractor selection/tender evaluation indicators used in public procurement in Tanzania and other nations and multilateral development banks. Higher-order construct or higher-order component (HOC) and Lower-order construct or Lower-order component (LOC) approaches were used to model constructs on more abstract dimensions (Sharma et al., 2022). This approach is relevant to this study because of several sub-components in each criterion. Thus, commercial examination, technical

examination and financial examination of tenders form the higher-order constructs. All variables were measured using a 5-point Likert scale with an ordinal ranking from strongly disagree to strongly agree. The operationalization of variables is indicated in Table 3.1.

Table 3.1 Variables and Measurements

Higher-order construct	Low-order construct	Code	Indicators	Scale & Measurement	Source
Commercial Examination of Tenders (CET) (Independent variable)	Verification (CET1)	CET11	Bid validity period	5-point Likert scale, from strongly agree to strongly disagree 1-SD; 2-D; 3=N; 4=A; and 5=SA	Dello and Yoshida (2017), Ismail, Sun and Bowles (2021), Marcarelli and Nappi (2019), (Fayezi et al., 2012; Ismail et al., 2021), Nguyen and Chileshe, 2015, Public Procurement Regulatory Authority, 2020
		CET12	Company registration certificate		
		CET13	Manufacturer authorization letter		
		CET14	Power of attorney		
	Eligibility (CET2)	CET21	Bidder originate from eligible source countries		
		CET22	Goods and services originate from eligible countries		
		CET23	Memorandum		
		CET24	Anti-bribery policy		
	Bid securities and license (CET3)	CET31	Tender securing declaration		
		CET32	Tender security		
		CET33	License/permit		
		CET34	Trading license		
	Completeness of tender	CET41	Partial bid		
		CET42	TIN certificate		

Higher-order construct	Low-order construct	Code	Indicators	Scale & Measurement	Source
	(CET4)	CET43	VAT certificate		
		CET44	Tax clearance certificate		
Technical Examination of Tenders (TET) (Mediating variable)	Financial Situation (TET1)	TET11	Audited financial statements	5-point Likert scale, from strongly agree to strongly disagree 1-SD; 2-D; 3=N; 4=A; and 5=SA	Chileshe *et al.* (2020), Amoah and Pretorius (2020), Mukherjee (2016), Adebisi, Ojo and Alao (2018), (PPRA, 2020),
		TET12	Bank statements		
		TET13	Average annual turnover		
		TET14	Financial resources (cash flow)		
	Contract conditions (TET2)	TET21	Compliance with technical specifications		
		TET22	Compliance with a delivery schedule		
		TET23	Compliance with work schedule		
	Experience (TET3)	TET31	General firm experience		
		TET32	Specific firm experience		
		TET33	History of non-performing contracts		
		TET34	Litigation history		
	Resource capability (TET4)	TET41	Key personnel qualification		
		TET42	Key personnel experience		
		TET43	Key equipment to undertake the project		
Financial	Corrections	FET11	Price read-out	5-point Likert	Ismail, Sun

Higher-order construct	Low-order construct	Code	Indicators	Scale & Measurement	Source
Examination of Tenders (FET) (Mediating variable)	of arithmetical errors (FET1)	FET12	Corrections of arithmetical errors	scale, from strongly agree to strongly disagree 1-SD; 2-D; 3=N; 4=A; and 5=SA	and Bowles (2021), Silva and Figueiredo, (2018); Matto, Ame and Nsimbila (2021) Public Procurement Regulatory Authority, 2020
		FET13	Conversion into a single currency		
	Lowest evaluated bid price (FET2)	FET21	Additions to the read-out price		
		FET22	Adjustments to the read-out price		
		FET23	Price deviations to the read-out price		
		FET24	Bidder's rank		
		FET25	Due diligence or post-qualification		
Performance of construction projects (PCP) (Dependent variable)	PCP1		Quality	5-point Likert scale, from strongly agree to strongly disagree 1-SD; 2-D; 3=N; 4=A; and 5=SA	Gadisa and Zhou (2021), Amoah and Pretorius (2020), Damoah and Akwei, 2017; Adebisi, Ojo and Alao, 2018, Mukherjee (2016), Damoah and Akwei (2017), Public Procurement Regulatory Authority, 2020
	PCP2		Cost		
	PCP3		Time		
	PCP4		Procurement complaints		
	PCP5		Project objectives		
	PCP6		Customer satisfaction		
	PCP7		Market price		
	PCP8		Public interest		

3.9 Validity and Reliability

The validity and reliability of this study were first improved using qualitative techniques and thereafter measurement of their levels was undertaken.

3.9.1 Validity

The content validity was improved by involving three experts specialized in procurement, construction and research methodology (supervisor) to review the tools. After receiving comments from those experts, the tool was modified to accommodate the provided comments. Furthermore, validity was ensured by adopting the constructs which have been used by previous studies on contractor selection and tender evaluation. Then, convergent validity and discriminant validity were used to measure the extent to which each construct is related or distinct from other constructs in a model (Harun et al., 2023). Finally, the tool was pre-tested through a pilot study aiming to acquire initial tests of scales and to ensure the validity and reliability of items are taken care before the data collection exercise.

3.9.2 Reliability

Reliability was enhanced by adopting a 5-point Likert scale. For this, internal consistency was measured using Cronbach's alpha approach and composite reliability. The proposed study took into account a value of 0.7 or more to assume that the tool is reliable (Kline, 2011).

3.10 Data Analysis

The quantitative data were analyzed using the Partial Least Squares Structural

Equation Modelling (PLS-SEM). PLS-SEM is a multivariate method that blends the measured and latent variables (Ryan, 2020). This approach allows researchers to estimate intricate models with multiple constructs, indicator variables and structural paths (Hair et al., 2018). Therefore, PLS-SEM is suitable for analysis for the following reasons. First, the proposed framework for this study is moderately complex for the reason that it includes both higher-order and low-order constructs. This makes PLS-SEM to be very appropriate than covariance-based SEM (CB-SEM). Second, the interaction between commercial, technical, and financial examination and the performance of projects is at an initial stage of theory development (Svensson, 2015). Using PLS-SEM enabled this study to contribute to the development of a contractor selection model in public sector procurement.

The analysis was performed using SmartPLS 3 software and the following were the analytical techniques; -

a) Descriptive statistics was adopted to test the measure of central tendency, dispersion and normality of the data using mean, standard deviation, variance, kurtosis and skewness.
b) The measurement model was used to test the construct reliability and validity including internal consistency reliability, convergent validity and discriminant validity.
c) Before the estimation of the structural equation, the assumptions of SEM namely linearity, normality, multicollinearity, and sample size were tested and satisfied.
d) The complete structural model was developed and estimated based on signs of the path coefficients, significance values, coefficient of determination and effect

sizes. The structural model was used to evaluate both direct and mediation effects.

e) Finally, hypotheses developed in this study were tested using the path coefficients and their significance values.

3.11 Research Ethics

In this study, research ethics were considered during the design of the research, data collection and report writing (Saunders et al., 2019). During the design, the researcher drafts a proposal following the required guidelines issued by the University. The proposal was presented to ensure that it meets the required standards. Then researcher was granted a research clearance letter from the Open University of Tanzania (Refer to Appendix 2).

Likewise, prospective respondents were informed on the cover page; about the purpose of the study, confidentiality aspects, anonymity, and the willingness of participants. Similarly, confidentiality was prioritized because the questionnaire did not require the names of respondents. Also, the research ethical matters for instance avoiding fabrication and falsification were taken on board in the data reporting stage. For this, the anonymity of respondents was protected during the analysis and discussion of results. All learning materials (publications) used in this study were credited by providing relevant citations.

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Chapter Overview

This chapter presents the results of data analysis. It begins by presenting the characteristics of the demographic profile of the respondents. Then, the descriptive profile of the examined variables is presented using mean, variance, standard deviation, kurtosis, and skewness. Similarly, the results of the measurement model and structural model are presented. Likewise, the results of the assumptions of SEM were presented. Finally, the chapter summarizes the results of hypothesis testing.

4.2 Demographics of the Respondents

The dataset consisted of 205 respondents sourced from user departments as defined in section 39 of the Public Procurement Act, CAP 410. The study demographic of respondents was based on four variables namely sex, department, experience and campus. Saunders et al. (2019) claim that these variables are used to assess how well the data represent the overall population and to explain why attitudes vary. Table 4.1 presents a summary of the demographic's respondents.

The study established the sex of the respondents on two levels namely male and female. In this regard, most of the respondents were male (80%) and remained were female (20%). This showed that most of the members of the user department were male than female. Out of 205 respondents, 52.2% were administrative staff and 47.8% were academic staff. This suggests that both the administrative and academic staff of the Institute were fairly involved.

Gaining practical experience in a work setting is crucial to possessing the right knowledge (Goel, 2016). On this basis, the study required respondent who has knowledge of tender evaluation exercises. Results on experience in tender evaluation revealed that 89.8% of respondents participated in tender evaluation. Besides, 10.2% of respondents did not participate in the tender evaluation exercise. Since most respondents (89.8%) have participated in the contractor evaluation process, this established that the study's respondents have sufficient experience with the issue under investigation.

Similarly, the respondents were sourced based on the IAA Campuses. The results showed that, most of them (64.9%) come from Arusha Campus, followed by Dar es salaam Campus (16.1%), Dodoma Campus (9.3%), Babati Campus (7.8%), and Songea Campus (2%). Arusha Campus is leading in terms of respondents because 65% of members of the user departments are staffed in Arusha (Headquarters). Since most respondents were sourced from Arusha campus, this suggest that respondents from this campus have adequate knowledge and experience on contractor selection process.

Table 4. 1 Demographics of the Respondents (n=205)

Description	Frequency	Percent
Sex		
Male	164	80
Female	41	20
Total	**205**	**100**
Experience		
Participated	184	89.8
Not participated	21	10.2
Total	**205**	**100**
Department		
Administrative	107	52.2
Academic	98	47.8
Total	**205**	**100**
Campus		
Arusha	133	64.9
DSM	33	16.1
Dodoma	19	9.3
Babati	16	7.8
Songea	4	2
	205	**100**

Source: Data from Survey (2024)

4.3 Descriptive Statistics

A variety of descriptive statistical techniques were used to find the data and assess its normality. The mean, variance, standard deviation, kurtosis, and skewness were the initial tools employed for this purpose. In addition, since the study used an online questionnaire the data set was free from data entry errors, missing data and outliers.

4.3.1 Commercial Examination Variable

This variable was measured by four (4) attributes (HOCs) on a scale of 1 to 5 with a mid-value of three. The mean value (3.7902, 3.8732, 4.0707, 4.1049) of all measured items is above three indicating a positive perception of respondents on the commercial examination of tenders. Besides, eligibility has the highest standard

deviation (1.1020) and variance (1.214) followed by bid securities and license (1.0944). This shows a varying degree of perception of the influence of the eligibility as well as bid securities and license. However, verification (1.0470) and Completeness of tender (1.0445) have the lowest standard deviation demonstrating that the opinions of the variable were widely felt to a similar extent.

Likewise, the normality was assessed using skewness and kurtosis. The results indicated that the skewness (-1.037 to -1.663) and kurtosis (0.171 to 2.021) for all items were between -1 and +2 which is an acceptable range. Kline (2011) states that a value between -1 and +1 is a valid range for normality. Nevertheless, other studies admit kurtosis and skewness values between -2 and +2 (Kline, 2011) and also for kurtosis values between -3 and +3 are also accepted (Balanda & MacGillivray, 1988). Thus, this evidences that the commercial examination variable is normally distributed. Table 4.2 shows the mean, standard deviation, kurtosis, and skewness of the commercial examination variable.

Table 4.2 Descriptive Statistics and Normality Testing for Commercial Examination Variable

Item	Mean	SD	Variance	Skewness	Kurtosis
Verification	4.1049	1.0470	1.096	-1.663	2.021
Eligibility	3.7902	1.1020	1.214	-1.037	0.171
Bid securities and license	4.0707	1.0944	1.198	-1.656	1.931
Completeness of tender	3.8732	1.0445	1.091	-1.180	0.614

Source: Data from Survey (2024)

4.3.2 Technical examination variable

The technical examination variable was assessed using four elements (HOCs) on a

scale of 1 to 5 with a mid-value of three (3). The mean value (3.7476,3.7902, 4.0707, 4.1187) of all measured variables is above three indicating a positive perception of respondents on the technical examination of tenders. Furthermore, financial situation (1.1835) and resource capability (1.1811) are highly important attributes in the technical examination because of the highest standard deviation followed by contract condition (1.1020). On the other hand, experience (1.198) is a less perceived attribute in the technical examination variable because of the lowest standard deviation and variance (1.198).

With regard to the normality, the results indicated that the skewness (-0.934 to -1.656) and kurtosis (-0.145 to 1.931) for all items fall within an acceptable range (Kline, 2011). In due course, the data for the technical examination variable were normally distributed. Table 4.3 presents the results of descriptive statistics for the technical examination variable.

Table 4.3 Descriptive Statistics and Normality Testing for Technical Examination Variable

Item	Mean	SD	Variance	Skewness	Kurtosis
Financial Situation	3.7476	1.1835	1.401	-0.934	-0.145
Contract conditions	3.7902	1.1020	1.214	-1.037	0.171
Experience	4.0707	1.0944	1.198	-1.656	1.931
Resource capability	4.1187	1.1811	1.395	-1.495	1.183

Source: Data from Survey (2024)

4.3.3 Financial Examination Variable

The financial examination variable was measured by two (2) items namely

corrections of arithmetical errors and lowest evaluated bid price on a scale of 1 to 5 with a mid-value of three (3). The mean value (3.8137, 3.9951) of all measured items is above three indicating an optimistic perception of respondents on the financial examination of tenders. Also, correction of arithmetical error is the most important item because of the highest standard deviation (1.0366) and variance (1.075). Likewise, the lowest evaluated bid price is the lowest important item in the financial examination variable because of the lowest standard deviation (0.9914) and variance (0.983).

Similarly, the results for normality showed that the skewness (-0.896, -1.247) and kurtosis (0.436, 0.990) for all items were between -1 and +1 which is an acceptable range (Kline, 2011) and evidences that financial examination variable is normally distributed. Table 4.4 shows the descriptive statistics of the financial examination variable.

Table 4.4 Descriptive statistics and normality testing for financial examination variable

Item	Mean	SD	Variance	Skewness	Kurtosis
Corrections of arithmetical errors	3.9951	1.0366	1.075	-1.247	0.990
Lowest evaluated bid price	3.8137	0.9914	0.983	-0.896	0.436

Source: Data from Survey (2024)

4.3.4 Performance of Construction Projects Variable

This variable was measured using eight (8) elements (as indicated in Table 4.5) on a

scale of 1 to 5 with a mid-value of three. The summary of elements and their results measuring performance is shown in Table 4.5. It was revealed that the mean value (3.7366, 3.7707, 3.8000, 3.8341, 3.8927, 3.9073, 3.9171) for all items was above three demonstrating a positive perception of respondents on the performance of construction projects at the Institute. Besides, market price (1.3206) and public interest (1.3103) are highly important perceived elements because of the highest standard deviation whereas quality (1.2773), customer satisfaction (1.2838), time (1.2295) and procurement complaints (1.2595) are moderately important perceived elements in the performance variable. However, cost (1.2038) and project objectives (1.2071) are less perceived elements in performance elements because of the lowest standard deviation and variance.

Correspondingly, the values of skewness (-0.783 to -1.070) and kurtosis (-0.145 to 0.205) for each measure were within (-1 to +1) the required range i.e. -2 to +2 (Kline, 2011), this shows that the performance variable is normally distributed.

Table 4.5 Descriptive Statistics and Normality Testing for Performance Variable

Item	Mean	SD	Variance	Skewness	Kurtosis
Quality	3.8000	1.2773	1.631	-0.945	-0.217
Cost	3.8927	1.2038	1.449	-1.068	0.205
Time	3.8341	1.2295	1.512	-0.942	-0.145
Procurement complaints	3.9171	1.2595	1.586	-0.972	-0.225
Project objectives	3.9073	1.2071	1.457	-1.070	0.205
Customer satisfaction	3.7707	1.2838	1.648	-0.812	-0.491
Market price	3.7366	1.3206	1.744	-0.845	-0.458
Public interest	3.7707	1.3103	1.717	-0.783	-0.585

Source: Data from Survey (2024)

4.4 Assessment of the Measurement Model

The measurement model of the study comprised three constructs namely CET, TET and FET as HOCs and CET1, CET2, CET3, CET4, TET1, TET2, TET3, TET4, FET1 and FET2 as LOCs. In the model, LOCs measured each HOC reflectively. To balance the evaluation of the relationship between each LOC and the HOC, each LOC comprises two to four indicators. Because all constructs, including HOCs and LOCs, were measured reflectively, the reflective-reflective model was useful (Hair et al., 2022). Consequently, the repeated indicators approach was adopted to evaluate the model which implies that all items of the reflective LOCs were simultaneously mapped to the HOCs in the reflective-reflective model. Therefore, the assessment of the measurement model in this study included an evaluation of the internal consistency reliability, convergent validity, and discriminant validity.

4.4.1 Reliability and Convergent Validity for LOCs

The current study used composite reliability, indicator loadings, and rho_A to measure the internal consistency reliability of the measurement model (Dijkstra & Henseler, 2015; Hair et al., 2018). According to Hair et al. (2018), the recommended loadings value for item reliability is above 0.7. Equally, values of 0.7 and 0.5 are considered acceptable for composite reliability and rho_A respectively to provide internal consistency reliability (Hair et al., 2022). Table 4.6 presents the results of indicator loadings and reliability for all LOCs. Since all values of indicator loadings, composite reliability and rho_A were above the recommended threshold of 0.7, this supports the internal consistency reliability.

Likewise, Table 4.6 further shows that the Average Variance Extracted (AVE) of the LOCs ranged from 0.706 to 0.939. To demonstrate a convergent validity, AVE must be greater or equal to 0.5 (Hair et al., 2022). This result offers strong proof that convergent validity exists. This indicates that the construct explains a greater portion of the variance in the construct indicators than the measurement error.

Table 4.6 Loadings, Reliability and Validity of LOCs (n=205)

Indicators	Indicator description	Factor loadings	Cronbach's Alpha	rho_A	Composite Reliability	Average variance extracted (AVE)
BIS	Bid Securities	0.954	0.900	0.901	0.930	0.769
COC	Contract conditions	0.955	0.966	0.966	0.978	0.936
COE	Correction of arithmetic errors	0.936	0.864	0.876	0.917	0.788
ELB	Eligibility	0.907	0.863	0.867	0.907	0.709
EXP	Experience	0.955	0.901	0.908	0.931	0.772
FIN	Financial	0.901	0.929	0.931	0.949	0.824
LEP	Lowest evaluated price	0.970	0.896	0.897	0.923	0.706
PCP	Performance	0.888	0.962	0.964	0.968	0.790
REC	Resource Capacity	0.955	0.967	0.967	0.979	0.939
TCO	Tender completeness	0.878	0.883	0.886	0.928	0.811
VER	Verification	0.930	0.873	0.882	0.914	0.726

Source: Data from Survey (2024)

4.4.2 Reliability and Convergent Validity for HOCs

According to Hair et al. (2022), the assessment of reliability and convergent validity of HOCs relies on the path coefficient to their LOCs as well as the average correlations between LOCs. This approach was also adopted in this study to measure the LOCs. However, the values of AVE, Cronbach's alpha, and composite reliability for the HOCs were computed to determine whether or not they show internal consistency and convergent validity as recommended by Dijkstra and Henseler

(2015) and Hair et al. (2022). The results of AVE, composite reliability and Cronbach's Alpha are presented in Table 4.7.

The results show that the values of AVE are 0.866, 0.887 and 0.908 for CET, TET and FET respectively, which are greater than the recommended limit of 0.5 for a component to enhance convergent validity. Besides, the values of composite reliability are 0.982, 0.988 and 0.953 for CET, TET and FET respectively. On the same basis, the values of Cronbach's Alpha are 0.935, 0.955 and 0.902 for CET, TET and FET respectively. Since all values of composite reliability and Cronbach's Alpha are greater than the recommended limit of 0.7, this supports the internal consistency reliability for HOCs.

Table 4.7 AVE, Composite Reliability and Cronbach's Alpha (n=205)

Indicators	Indicator description	Cronbach's Alpha	Composite Reliability	Average variance extracted (AVE)
CET	Commercial examination of tender	0.935	0.982	0.866
TET	Technical examination of tender	0.955	0.988	0.887
FET	Financial examination of tender	0.902	0.953	0.908

Source: Data from Survey (2024)

4.4.3 Discriminant Validity

The study examined discriminant validity to understand the degree to which each structural model construct empirically differs from the others (Hair et al., 2018). Two techniques namely Fornell-Larker criterion (Nguyen-Phuoc et al., 2020) and heterotrait-monotrait (HTMT) ratio of correlation (Krishnan et al., 2020) were applied for this purpose. Fornell and Larcker (1981) argue that discriminant validity

occurs when each construct's square root in the AVE is higher than its maximum correction with a different structural model construct. Using the HTMT ratio of correlations, discriminant validity does not exist when HTMT values are above 0.85 for conceptually distinct constructs and 0.90 for conceptually similar constructs (Hair et al., 2018). In this study, values of HTMT of all LOCs were below 0.90 suggesting that the discriminant validity is not a problem as shown in Table 4.8.

Table 4.8 Discriminant Validity for LOCs using HTMT Ratio of Correlation (n=205)

	BIS	COC	COE	ELB	EXP	FIN	LEP	PCP	REC	TCO	VER
BIS											
COC	0.761										
COE	0.723	0.716									
ELB	0.805	0.620	0.642								
EXP	0.742	0.872	0.707	0.646							
FIN	0.668	0.780	0.600	0.708	0.818						
LEP	0.702	0.649	0.822	0.686	0.660	0.614					
PCP	0.642	0.658	0.637	0.605	0.657	0.556	0.623				
REC	0.757	0.934	0.716	0.630	0.880	0.772	0.651	0.697			
TCO	0.797	0.602	0.585	0.778	0.596	0.591	0.618	0.535	0.588		
VER	0.878	0.758	0.740	0.765	0.740	0.648	0.670	0.629	0.750	0.738	

Source: Data from Survey (2024)

4.5 Testing Assumptions of SEM

Before the structural equation can be estimated, the assumptions made by the SEM

must be satisfied. Assumptions of SEM are similar to those of regression (Moschuris, 2015). The following assumptions namely linearity, normality, multicollinearity, and sample size were tested and satisfied.

4.5.1 Linearity

Linearity is an association between the independent variable dependent variable (Saunders et al., 2019). SEM treats the existence of the linear relationships between observed and latent variables (Civelek, 2018). To determine how much of a linear relationship, exists between two variables, the Pearson correlation coefficient "r" was used. In this instance, the study's variables were all substantially associated at the 0.01 level (2-tailed).

4.5.2 Normality

The analytical procedure for SEM requires normally distributed data in the patterns of measures (Ryan, 2020). The skewness and kurtosis were adopted to examine the normality of the data as indicated in section 4.3. Kline (2011) states that a value between -1 and +1 is a valid range for normality. Nevertheless, other studies admit kurtosis and skewness values between -2 and +2 (Kline, 2011) and also for kurtosis values between -3 and +3 are also accepted (Balanda & MacGillivray, 1988). The results presented in tables under section 4.3 showed the skewness and kurtosis for all variables were within the acceptable range. Therefore, since the values for each measure were between the acceptable limits, this shows that the normality assumption was satisfied.

4.5.3 Multicollinearity

Multicollinearity occurs when two (2) or more factors in a model are highly interrelated (Saunders et al., 2019). Multicollinearity is one of the sources of variability in the regression coefficient (Schinka et al., 2003). The study applied values of tolerance and variance inflation factor (VIF) to check the presence of multicollinearity. The values of tolerance for CET, TET and FET were 0.131, 0.124 and 0.377 respectively. Table 4.9 showed that all values of tolerance were greater than 0.10 which is the cut-off (Ryan, 2020). Correspondingly, the VIF results for CET, TET and FET were 7.634, 8.059 and 2.650 respectively. Table 4.9 presented that all VIF values were below 10 demonstrating that the problem of multicollinearity did not exist in this study.

Table 4.9 Results of Tolerance and VIF

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.474	.240		1.975	.050		
	CET	-.004	.038	-.015	-.112	.911	.131	7.634
	TET	.137	.038	.496	3.573	.000	.124	8.059
	FET	.162	.046	.280	3.518	.001	.377	2.650

a. Dependent Variable: PCP

4.5.4 Sample Size

Both measurement and structural models in PLS-SEM require the least sample size to be achieved to make their results meaningful (Ryan, 2020). According to certain studies, n=100 is a minimum sample size (Randhawa & Ahuja, 2017) whereas others suggest that n=200 is the ideal sample size (Chansatitporn & Pobkeeree, 2020) for

SEM. The sample size for this study was 205 which is above the minimum as well as the ideal sample size. Similarly, the study used Kaiser-Meyer-Olkin (KMO) and Bartlett's test of Sphericity to test the adequacy of the sample. Table 4.10 demonstrates that a sample adequacy test resulted in a value of 0.959, which is higher than the suggested value of 0.7 (Hair et al., 2010), suggesting that the sample was statistically satisfactory. On the same basis, it was found that Bartlett's Test of Sphericity was significant (p-value =.000), indicating a possible association between the observed variables in the exploratory factor analysis.

Table 4.10 Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.959
Bartlett's Test of Sphericity	Approx. Chi-Square	10977.726
	Df	1035
	Sig.	.000

4.6 Assessment of the Structural Model

The structural model was developed on the basis of the conceptual framework presented in Figure 2.1. The commercial examination was treated as the independent variable, technical examination and financial examination of tenders were treated as mediating variables, and performance of construction projects was treated as the dependent variable. The structural model was estimated using signs, significance and magnitude of the path coefficients (β), coefficient of determination (R square), effect sizes (f square) and the internal predictive relevance (Q square) (Hair et al., 2012; Shiau et al., 2019). The complete structural model estimate including the proposed mediational approach is shown in Table 4.11 and Figure 4.1.

The findings shown in Table 4.11 suggest that all direct paths for the variables of interest in the structural model were significant ($p<0.05$). In the same way, the path coefficients are positive and range from 0.261 to 0.791 while the effect sizes (f square) of the paths are 0.053, 0.079, 1.446 and 1.671. These effect sizes show that the magnitudes of the direct path are minimal to moderate (Hair et al., 2022). Nevertheless, the two mediating variables' inclusion leads to an R square value of 0.532. The model demonstrates a strong internal predictive significance because Q square value (0.414) is larger than zero (Dijkstra & Henseler, 2015). In addition, the direct path for the CET-> PCP in the model was not significant ($p=0.065$) which demonstrates that the model is full-mediation by TET and FET. The detailed findings concerning four specific objectives are presented hereunder.

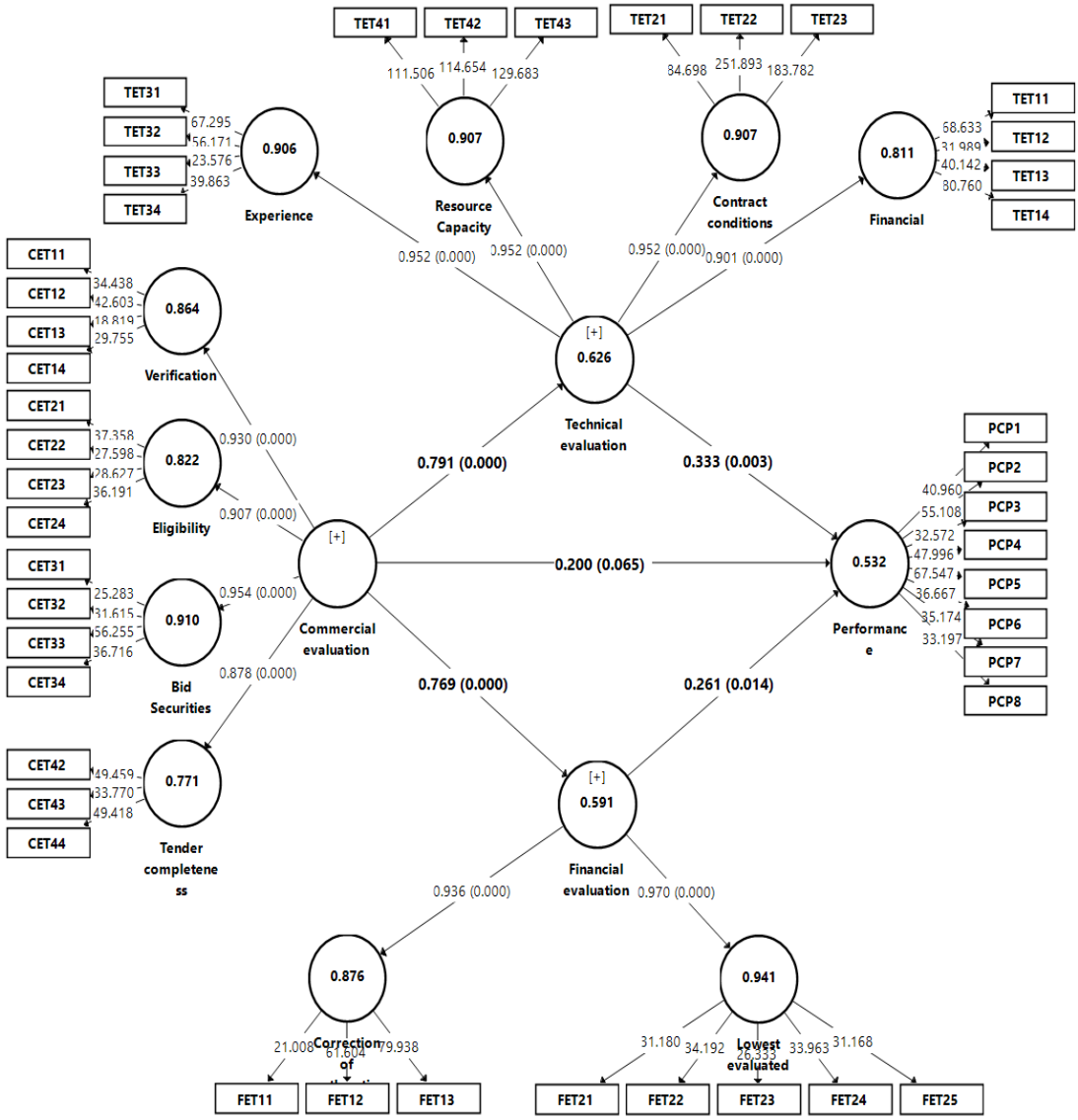
Table 4.11 Structural Model Estimation results with Presence of Mediators

Direct paths	**Coefficient**	**f^2**	**t-value**	***p*-value**
CET-> PCP	0.200	0.025	1.844	0.065[n]
H1: CET-> TET	0.791	1.671	16.303	0.000[a]
H2: TET-> PCP	0.333	0.079	2.959	0.003[a]
H3: CET-> FET	0.769	1.446	18.538	0.000[a]
H4: FET-> PCP	0.261	0.053	2.469	0.014[a]
R^2_{PCP}	**0.532**			
Adj.R^2_{PCP}	**0.525**			
Q^2_{PCP}	**0.414**			

[a]significant at $p\leq 0.01$; [n]not significant)

Source: Data from Survey (2024)

Figure 4.1 Structural Model estimates with presence of Mediators



Source: Data from Survey (2024)

4.6.1 The effect of Technical Examination of tenders on the Performance of Construction Projects

In assessing the effect of technical examination of tenders on the performance of construction projects, the direct path i.e. TET-> PCP is significant (P=0.003). Equally, the coefficient of the direct path is positive (0.333) and exhibits small effect sizes of 0.079. Likewise, the R^2 value is 0.536 which is a larger effect (Kline, 2011).

This implies that it is estimated that the technical examination of tender explained by 53.6% of the variance of performance of construction projects.

Detailed assessment of individual items in the construct revealed that TET2 (p=0.001) and TET4 (p=0.000) were significantly related to PCP while TET1 (p=0.135) and TET3 (p=0.427) were not associated with PCP. The estimation results for the effect of technical examination of tenders on the performance of construction projects is indicated in Table 4.12.

Table 4.12 Structural Model estimation results for the effect of Technical Examination of tenders on the Performance of Construction Projects

Construct	Coefficient	t-value	*p*-value
(Constant)	0.692	3.162	0.002
Financial Situation (TET1)	-0.121	-1.501	0.135
Contract conditions (TET2)	0.288	3.220	0.001
Experience (TET3)	0.078	0.796	0.427
Resource capability (TET4)	0.529	6.220	0.000

Dependent Variable: PCP

Source: Data from Survey (2024)

4.6.2 The effect of Financial Examination of tenders on the Performance of Construction Projects

In assessing the effect of financial examination of tenders on the performance of construction projects, the direct path i.e. FET-> PCP is significant (P=0.014). Correspondingly, the coefficient of the direct path is positive (0.261) and displays small effect sizes (f^2) of 0.053. Likewise, the R^2 value is 0.430 which is a bigger effect (Kline, 2011). This indicates that it is estimated that the financial examination

of the tender explained 43% of the variance in the performance of construction projects.

A comprehensive assessment of distinct items in the construct revealed that FET1 (p=0.000) and FET2 (p=0.001) were significantly related to PCP. The estimation results for the effect of technical examination of tenders on the performance of construction projects is indicated in Table 4.13.

Table 4.13 Structural model estimation results for the effect of Technical Examination of tenders on the Performance of Construction Projects

Construct	Coefficient	t-value	*p*-value
(Constant)	0.859	3.462	0.001
Corrections of arithmetical errors (FET1)	0.415	4.236	0.000
Lowest evaluated bid price (FET2)	0.344	3.354	0.001

Dependent Variable: PCP

Source: Data from Survey (2024)

4.6.3 The mediating effect of Technical Examination of tenders on Commercial Examination of tenders and Performance of Construction Projects

The present study assessed the mediating effect of technical examination of tenders on commercial examination of tenders and the performance of construction projects. For this, both the direct and indirect effect of TET on CET and the PCP were assessed using the values of bootstrapped confidence intervals (Sarstedt et al., 2019). Table 4.14 presents the results, demonstrating that there is an indirect effect of technical examination of tenders through commercial examination of tenders and the performance of construction projects. This indirect effect is both positive (β=0.263) [0.096, 0.454] and significant (p=0.004).

Similarly, the findings presented in Table 4.14 exhibited that in the presence of TET (mediator), the direct effect of commercial examination of tenders and the performance of construction projects disappeared. This suggests that the structural model demonstrates an indirect-only mediation effect, implying that the study explored all possible explanations in the existing literature within the context of the present study that links commercial examination of tenders and the performance of construction projects (Baron & Kenny, 1986).

Table 4.14 Mediation Analysis of Indirect Effect (CET-> TET ->PCP)

Indirect paths	Coefficient	SD	t-value	P Value	BI (2.5%, 97.5%)
CET-> TET ->PCP	0.263	0.091	2.878	0.004[a]	(0.096, 0.454)

[a]significant at p≤ 0.01; [n]not significant)

4.6.4 The mediating effect of Financial Examination of tenders on Commercial Examination of tenders and Performance of Construction Projects

The study assessed the mediating effect of financial examination of tenders on the commercial examination of tenders and the performance of construction projects. For this, both the direct and indirect effect of FET on CET and the PCP were assessed using the values of bootstrapped confidence intervals (Sarstedt et al., 2019). Table 4.15 presents the outcomes, indicating that there is an indirect effect of financial examination of tenders through commercial examination of tenders and the performance of construction projects. This indirect effect is both positive (β=0.200) [0.053, 0.370] and significant (p=0.013).

Likewise, the findings presented in Table 4.15 exhibited that in the presence of FET (mediator), the direct effect of commercial examination of tenders and the performance of construction projects disappeared. This suggests that the structural model demonstrates an indirect-only mediation effect, implying that the study explored all possible explanations in the existing literature within the context of the present study that links commercial examination of tenders and the performance of construction projects (Baron & Kenny, 1986).

Table 4.15 Mediation Analysis of Indirect Effect (CET-> FET ->PCP)

Indirect paths	Coefficient	SD	t-value	P Value	BI (2.5%, 97.5%)
CET-> FET ->PCP	0.200	0.081	2.485	0.013[b]	(0.053, 0.370)

[a]significant at p≤ 0.01; [n]not significant)

4.6.5 Findings from the Documentary Review on commercial Examination, Technical Examination and Financial Examination of Tenders

The data collected from audit reports revealed a number of shortcomings related to commercial examination, technical examination and financial examination of tenders as follows:

Shortcomings in the commercial examination of tenders

a) During the financial year 2017-18, the University of Dar es Salaam awarded contracts to unregistered contractor (BICO) worth TZS 12.78 billion for renovation and rehabilitation of the University Infrastructure (NAOT, 2023c).

b) On 21st December 2020, the Ministry of Home Affairs procured 3 trucks from unauthorized dealer (Tanzania Automotive Technology Centre) worth TZS 2.98 billion (NAOT, 2023a).

c) During the financial year 2021-22, 27 LGAs procured goods and services worth TZS 5.68 billion from suppliers who were not shortlisted by the Government Procurement Services Agency (GPSA) (NAOT, 2023b).

d) During financial years 2016-17, 2017-18, 2018-19, and 2019-20, 27 LGAs, 18 LGAs, 34 LGAs, and 39 LGAs respectively, procured goods and services worth TZS 11.3 billion from suppliers who were not shortlisted by GPSA (NAOT, 2021).

e) During the financial year 2021/22, 74 entities, equivalent to 31.8% of the audited PEs (232) did not adequately prepared tender documents with anomalies. The major anomalies observed were: failure to modify the tender data sheets, incomplete tender documents and failure to state technical requirements (PPRA, 2022).

f) During the financial year 2021/22, some criteria for commercial examination of tenders with respect to 87 tenders worth TZS 125 billion were stated in the tender documents but were not created in TANePS to facilitate evaluation exercise. Those criteria were valid business license, power of attorney, certificates for tax identification number, value added tax, and tax clearance (PPRA, 2022).

Shortcomings in the technical examination of tenders

a) On 16th March 2022, Muhimbili National Hospital engaged a contractor (Shivani Scientific Industries Ltd) who had no required specialist which led to the termination of the contract TZS 1.10 billion (NAOT, 2023c).

b) In May 2022, TEMESA awarded 7 contracts worth TZS 6.16 Billion to a contractor who has a limited number of key personnel and equipment (NAOT, 2023a).

c) During the financial year 2021-22, 20 LGAs procured building materials worth TZS 1.38 billion without detailing technical specifications (NAOT, 2023b).

d) During financial year 2019-20, 2 LGAs (Sumbawanga DC & Kalambo DC) implemented two construction contracts worth TZS 3.5 billion without technical specifications (NAOT, 2021).

e) During the financial year 2019-20, Ikungi DC awarded a contract worth TZS 405 million to a non-Responsive Bidder (TAISH Construction Ltd) because the bidder did not meet criteria such as (NAOT, 2021):

- Failure to submit evidence showing relevant work experience in the last 3 years;
- Failure to submit evidence showing possession of two water bowsers;
- Failure to submit evidence showing qualification of project manager;
- Failure to comply with the average turnover of TZS 250 million for 3 years;
- Failure to submit evidence showing the financial capability;

f) During the financial year 2021/22, 13 procuring entities did not adequately evaluate 28 tenders worth TZS 240.9 billion. Those entities did not assess submitted BOQs and financial capability of the tenderers (PPRA, 2022).

g) During the financial year 2018/19, the following weaknesses related to technical examination of tenders were observed include missing detailed technical specifications and technical drawings; inconsistency between drawings, technical specifications and BOQs (PPRA, 2019).

Shortcomings in the financial examination of tenders

a) In June 2020, Tanzania Electric Supply Company Limited failed to conduct due diligence on time resulting in a significant price increase of USD 3.22 million equivalent to TZS 7.41 billion (NAOT, 2023c).

b) During financial year 2019-20, three (3) LGAs namely Mpanda DC, Nsimbo DC, and Chunya DC did not adequately carry out the correction of arithmetic errors causing an increase in project cost by TZS 58 million (NAOT, 2021).

c) During the financial year 2019-20, four (4) councils did not undertake the due diligence on the contracts worth TZS 22 million to verify the contractor's capability in terms of technical, financial, key personnel and equipment (NAOT, 2021).

4.6.6 Hypotheses Testing

The study was guided by four hypotheses as indicated in section 1.5. The hypotheses were tested by using the significance and magnitude of the path coefficients (β) and effect sizes (f square).

For this, the probability value (p-value) of 0.01 was used as a criterion for deciding to reject or retain the hypothesis. The hypothesis is not supported when the p-value is higher than 1% ($p > .01$). The significance is reached when the p-value is less or

equal to 0.01, at which point the hypothesis is supported (Kumar & Purani, 2018). The results of hypothesis testing are shown in Table 4.16.

Table 4.16 Summary of Results of the Hypotheses Testing

S/n	Hypothesis	Results
H1	Technical examination of tenders is positively related to the performance of construction projects	Supported
H2	Financial examination of tenders is positively related to the performance of construction projects	Supported
H3	Technical examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects	Supported
H4	Financial examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects	Supported

a) Hypothesis 1

The first hypothesis (H1) stated that technical examination of tenders is positively related to the performance of construction projects. This hypothesis is maintained because the corresponding path coefficient (0.333) is positive and significant at $p \leq .01$.

b) Hypothesis 2

The second hypothesis (H2) proposed that financial examination of tenders is positively related to the performance of construction projects. This hypothesis is maintained because the corresponding path coefficient (0.261) is positive and significant at $p \leq .01$.

c) Hypothesis 3

The third hypothesis (H3) stated that technical examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects. This hypothesis is maintained because the corresponding path coefficient (0.263) is positive and significant at $p \leq .01$.

d) Hypothesis 4

The fourth hypothesis (H4) proposed that financial examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects. This hypothesis is maintained because the corresponding path coefficient (0.200) is positive and significant at $p \leq .01$.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

5.1 Chapter Overview

The fifth chapter discusses the outcomes of the data analyses carried out and presented in chapter four. The discussion is split into three sections, namely managerial discussion, theoretical discussion, and policy discussion. The detailed commercial examination, technical examination and performance of the construction projects model and the accompanying hypotheses (H1 & H3) relate to the first and the third objectives. Correspondingly, the detailed commercial examination, financial examination and performance of construction projects model and the accompanying hypotheses (H2 & H4) relate to the second and the fourth objectives.

5.2 Managerial Discussion

5.2.1 Commercial Examination, Technical Examination and Performance of Construction Projects

According to PPRA (2020), the technical examination of tenders is the second stage of the contractor selection process. The first one is the commercial examination where a tender is assessed on the basic criteria such as eligibility, verification, completeness and securities. The findings of this study revealed that technical examination is associated with performance of construction projects (H1). The findings further revealed that the technical examination of tenders positively mediates the relationship between commercial examination of tenders and performance of construction projects (H3). This was evidenced by the results of R^2

of the fitted model i.e. 0.536 and the same was significant. The obtained R^2 implies that 53.6% of the variance in the performance of construction projects is influenced by the technical examination of tenders. This reinforces the significance of technical examination in achieving the best project performance. The results also agree with the study by Watt et al. (2009) and Ismail et al. (2021) who identify technical examination attributes as key factors in contractor selection in Australia and Malaysia respectively.

However, the detailed analysis indicated that two attributes of technical examination of tenders namely contract conditions and resource capability, out of four were significant criteria to enhance the performance of construction projects.

First, "contract conditions" in this study was assessed in terms of the extent to which the contractor's proposal complies with technical specifications, drawings, bill of quantities (BOQ), delivery and work schedule (Al-Yahya & Panuwatwanich, 2018). From the purchaser's point of view, contract conditions are emphasized in four sections of the bidding documents which are shared with the contractors. These sections are instructions to tenderers, tender data sheet, general conditions of contract and special conditions of contract (PPRA, 2015). In practice, instructions to tenderers and tender data sheet sections play a significant role for the contractor to a prepare responsive proposal. On the other hand, general and special conditions of contract sections provide the whole picture about payment, delivery, changes, variation, inspection, disputes, and the like.

This observation provides that procuring entities should ensure that technical specifications, drawings, BOQ, delivery and work schedule are adequately prepared

and how the same is to be measured during the selection process. This is because some studies revealed that some projects fail because of shortcomings in preparation documents related to contract conditions (Adebisi et al., 2018; Amoah & Pretorius, 2020). Some of the identified shortcomings in previous studies were related to payment terms, delivery terms, structural quality, time control and project schedules (Adebisi et al., 2018; Amoah & Pretorius, 2020; Gadisa & Zhou, 2021). According to Adebisi et al. (2018), all these shortcomings can be minimized once procuring organizations have the technical capacity to design and evaluate tenders and proposals.

Second, resource capability was assessed using personnel qualification, personnel experience, and equipment to undertake the project. The findings of the current study support previous studies which argue that the success of construction projects depends on the qualified and experienced personnel who execute and supervise works (Adebisi et al., 2018; Gadisa & Zhou, 2021). Previous studies, for instance, Mchopa (2020) and Matto (2023) revealed that procuring entities in Tanzania that execute construction projects under the force account approach lacked sufficient civil engineers and civil technicians to supervise the projects. On equipment criterion, the results are fairly consistent with other studies in Tanzania and Turkey which identify the importance of the availability of relevant tools and equipment for the success of projects (Chileshe et al., 2020; Özyürek & Erdal, 2023).

Lastly, the findings of this study support the third hypothesis which states that technical examination of tenders positively mediates the relationship between

commercial examination of tenders and performance of construction projects. This advocates that the technical examination of tender is necessary to increase performance of construction projects.

5.2.2 Commercial Examination, Financial Examination and Performance of Construction Projects

The financial examination of tenders is the third stage of contractor selection process (PPRA, 2020). The first and second is the commercial examination and technical examination where a tender is assessed on the basic commercial criteria (eligibility, verification, completeness & securities) and technical aspects (capability and contract conditions). The findings of this study revealed that financial examination is associated with performance of construction projects (H2). The results further revealed that the financial examination of tenders positively mediates the relationship between the commercial examination of tenders and the performance of construction projects (H4). This was evidenced by the results of R^2 of the fitted model i.e. 0.430 and the same was significant. The obtained R^2 implies that 43% of the variance in the performance of construction projects is influenced by the financial examination of tenders. This reinforces the significance of financial examination in achieving the best project performance. The results also agree with the study by Lundberg and Bergman (2017b) and Ismail et al. (2021) who identify financial examination attributes as key factors in contractor selection in Sweden and Malaysia respectively.

However, detailed analysis indicated that all attributes of financial examination of tenders namely corrections of arithmetical errors and lowest evaluated bid price were

significant criteria to enhance the performance of construction projects. Based on the descriptive statistics results, the correction of arithmetical errors was the highest perceived item in the financial examination of a tender variable because of the highest mean (3.9951), SD (1.0366) and variance (1.075). Correction of arithmetical errors is a standard procedure in tender evaluation. It includes the computation of addition and multiplication of contractor quoted unit price against estimated quantities and their corresponding totals.

Emphasizing the importance of correction of arithmetical errors, Regulation 207 (2)(a) of GN. No. 446 of 2013 requires procuring entities to correct purely arithmetical errors that are found during the examination of tenders. Going beyond, the cited regulation requires the identified errors to be communicated to the bidder and the same to be confirmed by the respective bidder. The confirmation is based on whether or not the prospective bidder accepts such modifications. According to PPRA (2020), if the bidder does not accept the modified tender sum, its offer will be rejected.

This finding implies that construction works tenders which have been floated based on BOQs, and deviation between the unit prices and the sub-total or sub-total and grand-total must be corrected accordingly. Thus, procuring entities should ensure that all substantially responsive bids are fairly checked by the evaluation committee for arithmetical errors.

Likewise, on the lowest evaluated bid, the results showed that the same is a significant attribute that enhances the performance of construction projects. The

lowest evaluated bid entails a bid that is found to be the most advantageous in terms of quality, payment terms, delivery period, price and financial and technical resource capabilities of the bidders (Kotoka, 2012). The findings are in tandem with those of Bergman and Lundberg (2013); Huka et al. (2014) and Ameyaw et al. (2015). Nevertheless, the finding differs from Tutu et al. (2019) who reported that the use of the lowest evaluated bid is a major weakness in traditional procurement. In the context of procurement, the lowest bid considers a price as major component while the lowest evaluated bid considers price and attributes such as quality, time, cost and other contract conditions which measure the capability of the contractor.

The financial examination of tender also requires adjustments to the read-out price to be undertaken for facilitating ranking exercise as advocated by Schotanus et al. (2022). Finally, the procuring entity should ensure that due diligence (also known as post-qualification) is undertaken for the construction projects. The same argument was emphasized by Landale et al. (2017) in order to validate the contractor's previous performance as indicated in the proposal/bid. According to Klay (2015), due diligence refers to the vetting of contractors' previous experience and capability in terms of technical, human and financial. Construction projects (though varies in nature and scope – building, civil, electrical, mechanical and specialist) require a contractor with relevant experience and technical and financial capabilities. These capabilities are included in the submitted proposal and must be verified by the appropriate authority or physically.

Generally, the findings of this study support the fourth hypothesis which states that financial examination of tenders positively mediates the relationship between

commercial examination of tenders and performance of construction projects. This advocates that the financial examination of tender is necessary to increase performance of construction projects.

5.3 Theoretical Discussion

The principal-agent theory or agency theory has been predominant theoretical frameworks that provide insights on contracts formed in a condition where one party holds more information than the other (Parker et al., 2018). Such circumstance creates an agency problem and increases the cost of managing the agent. In the construction sector, the procuring entity is the principal who employs the contractor (the agent) for executing a construction project. Previous studies associated agency problems with adverse selection, moral hazard and signalling (Ceric, 2012; Parker et al., 2018; Roach, 2016). They suggest the principal is required to institute a strong monitoring mechanism, which according to them, is applied during contract administration. Those studies concluded that the principal-agent theory is relevant to the contract administration stage.

The results of this study revealed that the contractor selection process is significantly associated with the performance of construction projects (refer to H1, H2, H3 & H4). This advocates that the principal-agent theory is also relevant to the contract formation stage. The respondents agreed that the symptoms of adverse selection, moral hazard and signalling can also be monitored during the selection process (also known as tender process or contract formation). This observation is fairly consistent with other studies such as Taminiau and Heusinkveld (2017) who showed the

applicability of the agency theory in the audit tendering process and Essien et al. (2019) who applied this theory to relate supplier selection process and performance.

In the context of public sector procurement and supply chain, contract formation and contract administration are two main categories of contract stage. Contract formation is also referred to as upstream or pre-award activities while contract administration is also known as downstream or post-award activities (Harrison & Hoek, 2008). According to Farahani et al. (2009), successful procurement and supply chain performance depend on the extent to which both upstream and downstream activities are adequately monitored.

The theoretical contribution is obvious, the principal can institute a monitoring mechanism in both the contract formation stage and the contract administration stage. Thus, in assessing the performance of construction projects, activities related to the contractor selection process should not be ignored. The set selection criteria related to commercial examination, technical examination and financial examination stages can minimize adverse selection, moral hazard and signalling risks once are properly administered. This study advocates that the principal-agent theory or agency theory is relevant to the contract formation stage.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Chapter Overview

This chapter narrates a conclusion, contribution, recommendations and suggestions for forthcoming studies. It begins by conclusions based on the research purpose. It then continues to outline the theoretical, empirical, managerial and policy contributions. Finally, the recommendations for future studies are highlighted.

6.2 Conclusions

The purpose of this study was to examine the determinants of the contractor selection process and the performance of construction projects in Tanzania. In particular, the scope covered the contract formation stage where commercial examination, technical examination and financial examination were the key the attributes of contractor selection process. These attributes are used to evaluate the capability of contractors and providers in a public procurement context.

On the basis of the findings, commercial examination, technical examination and financial examination are one of the key potentials to improve the performance of construction projects. For this, commercial examination attributes namely eligibility, verification, completeness and securities were significant criteria under this construct. Furthermore, detailed analysis indicated that two attributes of technical examination of tenders namely contract conditions and resource capability, out of four were significant criteria to enhance the performance of construction projects. On

the other hand, detailed analysis revealed that all attributes of financial examination of tenders namely corrections of arithmetical errors and lowest evaluated bid price were significant criteria to enhance the performance of construction projects.

Although most previous studies pay attention to contract implementation attributes, the study suggests that contractor selection attributes are also required to achieve the best performance in construction projects. The results show that, technical examination and financial examination are significantly associated with performance of construction projects. Furthermore, both mediate the relationship between commercial examination of tenders and performance of construction projects. This implies that technical examination and financial examination increase performance of construction projects. The study concludes that contractor selection attributes predict performance of construction projects.

6.3 Contribution of the Study

The findings of this study provide valuable insights for theory, practice and policy.

6.3.1 Theoretical Contribution

This study advocates that the principal-agent theory or agency theory is relevant to the contract formation (selection) stage. The results demonstrate that deficiencies in commercial, technical, and financial examinations can lead to moral hazard, adverse selection, and signalling. According to the findings of this study, the principal is required to institute a monitoring mechanism in both the contract formation stage and the contract administration stage.

6.3.2 Contribution to Knowledge

Empirically, few studies tried to associate contract formation activities such as contractor selection and performance of construction projects. Using principal-agent theory, the present study filled this gap and enriched the literature. This was done by examining the determinants of contractor selection process and the performance of construction projects. The study demonstrates that technical examination and financial examination are associated with performance of construction projects. The results further revealed that technical examination and financial examination positively mediate the relationship between commercial examination of tenders and performance of construction projects. Therefore, this study contributes to the existing knowledge by linking the contractor selection process and the performance of construction projects.

6.3.3 Contribution to Policy

Tanzania has started a long-term development plan to reach sustainable human development by 2025. The development of infrastructure has been regarded as a critical driver for achieving the vision. The construction industry is a vital economic sector that influences the majority of other sectors. Thus, selecting the right contractor who is commercially, technically and financially capable is very significant. The capable contractors create a globally competitive industry that can handle the majority of construction projects and guarantee value for money for their clients.

6.3.4 Contribution to Managerial Practices

The results of this study have wide implications for the management of procuring entities. In practice, procuring entities executing construction projects, institute monitoring mechanisms in the contract administration stage. However, the findings contribute that procuring entities can institute monitoring mechanisms in both the contract formation stage and contract administration stage.

6.4 Recommendations of the Study

The overall results of this study revealed that the contractor selection process is significantly related to the performance of construction projects. Thus, the study put forward the following recommendations:

a) The policymakers should integrate the contractor selection process and the performance of construction projects;
b) The procuring entities should ensure the contractor selection criteria are adequately prepared including the measurement indicators;
c) The members of the evaluation/selection committee are properly appointed with relevant qualifications and experience;
d) The selection team should examine the contractor's proposals in accordance with the terms and conditions stipulated in the tender documents;

6.5 Suggestions for Further Research

a) The study draws its empirical evidence in Tanzania, therefore, the generalization of its findings to the global construction environment is not

guaranteed. Hence, different results might be exposed if a similar study is carried out in diverse settings.

b) The present study covered construction projects where procurement of works, goods and services were assessed, the future study may focus on the consultancy services projects.

c) This study adopted a quantitative approach in the data collection and analysis. It is recommended that future studies may concentrate on qualitative methodology.

REFERENCES

Abdullahi, B., Ibrahim, Y. M., Ibrahim, A., & Bala, K. (2020). Development of e-tendering evaluation system for Nigerian public sector. *Journal of Engineering, Design and Technology*, *18*(1), 122–149. https://doi.org/10.1108/JEDT-01-2019-0004.

Adebisi, E. O., Alao, O. O., & Ojo, S. O. (2020). Assessment of early warning signs predisposing building projects to failure in Nigeria. *Journal of Engineering, Design and Technology*, *18*(6), 1403–1423. https://doi.org/10.1108/JEDT-08-2019-0214.

Adebisi, E. O., Ojo, S. O., & Alao, O. O. (2018). Assessment of factors influencing the failure and abandonment of multi-storey building projects in Nigeria. *International Journal of Building Pathology and Adaptation*, *36*(2), 210–231. https://doi.org/10.1108/IJBPA-10-2017-0048.

Al-Yahya, M., & Panuwatwanich, K. (2018). Implementing e-tendering to improve the efficiency of public construction contract in Saudi Arabia. *International Journal of Procurement Management*, *11*(3), 267–294. https://doi.org/10.1504/IJPM.2018.091666.

Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and qualitative research in the built environment: application of "mixed" research approach. *Work Study*, *51*(1), 17–31. https://doi.org/10.1108/00438020210415488.

Ameyaw, C., Adjei-Kumi, T., & Owusu-Manu, D.-G. (2015). Exploring value for money (VfM) assessment methods of public-private partnership projects in Ghana. *Journal of Financial Management of Property and*

Construction, *20*(3), 268–285. https://doi.org/10.1108/JFMPC-01-2015-0003.

Amoah, C., & Pretorius, L. (2020). Evaluation of the impact of risk management on project performance in small construction firms in South Africa. *Journal of Engineering, Design and Technology*, *18*(3), 611–634. https://doi.org/10.1108/JEDT-06-2018-0098.

Andersen, B., Henriksen, B., & Spjelkavik, I. (2008). Benchmarking applications in public sector principal-agent relationships. *Benchmarking: An International Journal*, *15*(6), 723–741. https://doi.org/10.1108/14635770810915913.

Azer, J., Taheri, B., & Gannon, M. (2022). A Critical View on Mixed-Method Approaches to Tourism and Hospitality Research. In F. Okumus, S. M. Rasoolimanesh, & S. Jahani (Eds.), *Advanced Research Methods in Hospitality and Tourism* (pp. 5–24). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80117-550-020221002.

Baker, P., Giustozzi, L., Gloser, J., Hanzl-Weiß, D., Merkus, E., Molemaker, R.-J., & Stehrer, R. (2017). *The European construction value chain: performance, cChallenges and role in the GVC* (418).

Balanda, K. P., & MacGillivray, H. . (1988). Kurtosis: A critical review. *The American Statistician*, *42*(2), 111–119.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173.

Bergman, M. A., & Lundberg, S. (2013). Tender evaluation and supplier selection methods in public procurement. *Journal of Purchasing and Supply Management*, *19*(2), 73–83. https://doi.org/10.1016/j.pursup.2013.02.003.

Ceric, A. (2012). The principal-agent theory and the role of project managers in construction: Guidelines for future research. *Joint CIB International Symposium W055, W065, W089, W118, TG76, TG78, TG81, TG84: Research to Practice, 26–29 June 2012*, 766–775.

Chansatitporn, N., & Pobkeeree, V. (2020). Leadership and quality management measurement models: An empirical study. *International Journal of Health Care Quality Assurance*, *33*(1), 52–66. https://doi.org/10.1108/IJHCQA-07-2019-0118.

Chileshe, N., Edwards, D. J., Kavishe, N., & Haupt, T. C. (2020). Perception on challenges impacting bid decision of indigenous building contractors in Dar Es Salaam, Tanzania. *Journal of Engineering, Design and Technology*, *18*(6), 1641–1662. https://doi.org/10.1108/JEDT-10-2019-0280.

Chrisidu-budnik, A., & Przedańska, J. (2017). The agency theory approach to the public procurement system. *Wroclaw Review of Law, Adminstration & Economics*, *7*(1), 154–165. https://doi.org/10.1515/wrlae-2015-0059.

Civelek, M. E. (2018). *Essentials of structural equation modeling*. Zea E-Books.64. https://doi.org/10.13014/K2SJ1HR5.

Corvellec, H., & Macheridis, N. (2010). The moral responsibility of project selectors. *International Journal of Project Management*, *28*(3), 212–219.

https://doi.org/10.1016/j.ijproman.2009.05.004.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson Education.

Creswell, J. W. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). Sage Publications.

Damoah, I. S., & Akwei, C. (2017). Government project failure in Ghana: a multidimensional approach. *International Journal of Managing Projects in Business*, *10*(1), 32–59. https://doi.org/10.1108/IJMPB-02-2016-0017.

Dello, A., & Yoshida, C. (2017). Online tendering and evaluation for public procurement in Tanzania. *Proceedings - 18th IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing, SNPD 2017*, 137–141. https://doi.org/10.1109/SNPD.2017.8022713.

Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Quarterly*, *39*(297–316).

Essien, E., Lodorfos, G., & Kostopoulos, I. (2019). Antecedents of supplier selection decisions in the public sector in Nigeria. *Journal of Public Procurement*, *19*(1), 15–45. https://doi.org/10.1108/JOPP-03-2019-023.

Farahani, R. Z., Asgari, N., & Davarzani, H. (2009). Supply Chain and Logistics in National, International and Governmental Environment: Concepts and Models. In *Supply Chain and Logistics in National, International and Governmental Environment: Concepts and Models*. Springer International Publishing.

Fayezi, S., Loughlin, A. O., & Zutshi, A. (2012). Agency theory and supply chain

management: A structured literature review. *Supply Chain Management: An International Journal*, *17*(5), 556–570. https://doi.org/10.1108/13598541211258618.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.2307/3151312.

Gadisa, B., & Zhou, H. (2021). Exploring influential factors leading to the poor performance of public construction project in Ethiopia using structural equation modelling. *Engineering, Construction and Architectural Management*, *28*(6), 1683–1712. https://doi.org/10.1108/ECAM-12-2019-0689.

Gannon, M. J., Taheri, B., & Azer, J. (2022). Contemporary Research Paradigms and Philosophies. In F. Okumus, S. M. Rasoolimanesh, & S. Jahani (Eds.), *Contemporary Research Methods in Hospitality and Tourism* (pp. 5–19). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80117-546-320221002.

Goel, A. (2016). Understanding pre-qualification preferences of public clients in traditional and design-build procurement systems. *International Journal of Procurement Management*, *9*(6), 684. https://doi.org/10.1504/IJPM.2016.079980.

Gunduz, M., & Elsherbeny, H. A. (2020). Critical assessment of construction contract administration using fuzzy structural equation modeling. *Engineering, Construction and Architectural Management*, *27*(6), 1233–1255. https://doi.org/10.1108/ECAM-05-2019-0246.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A Global Perspective* (7th ed.). Pearson Prentice Hall.

Hair, J. F., Joseph, F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publication, Inc.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*, 414–433. https://doi.org/10.1007/s11747-011-0261-6.

Hajek, J., Vrbova, L., & Kolis, K. (2017). Hierarchical structure of criteria used for contractor selection for construction works. Empirical research from the Czech Republic. *International Journal of Procurement Management, 10*(4), 444–460. https://doi.org/10.1504/IJPM.2017.085035.

Harrison, A., & Hoek, R. (2008). *Logistics management and strategy: competing through the supply chain* (3rd ed., Vol. 6, Issue 3). Pearson Education. https://doi.org/10.1080/1367556031000123052

Harun, M. D., Hogset, H., & Mwesiumo, D. (2023). Dynamic capabilities and sustainability performance: Exploring the moderating role of environmental dynamism in the Norwegian fishing industry. *Sustainable Development*, 1–20. https://doi.org/10.1002/sd.2536.

Huka, H. A., Mchopa, A. D., & Kimambo, J. J. (2014). Analysis of procurement

procedures in local government authorities: Experience after procurement reforms and case analysis from selected councils in Kilimanjaro Tanzania. *European Journal of Business and Management*, *6*(18), 16–23.

Ismail, M. R., Sun, M., & Bowles, G. (2021). A risk-oriented tender evaluation system for construction projects in Malaysia. *Engineering, Construction and Architectural Management*, *28*(7), 1887–1907. https://doi.org/10.1108/ECAM-06-2018-0225.

Johnston, A. (2014). Rigour in research: Theory in the research approach. *European Business Review*, *26*(3), 206–217. https://doi.org/10.1108/EBR-09-2013-0115.

Keil, P. (2005). Principal agent theory and its application to analyze outsourcing of software development. *ACM SIGSOFT Software Engineering Notes*. https://doi.org/10.1145/1082983.1083094.

Khan, S. A., & Hosany, Y. I. Al. (2016). Multi-million construction contractor selection: a comparative study. *International Journal of Intelligent Enterprise*, *3*(2), 93–119. https://doi.org/10.1504/IJIE.2016.076030.

Klay, W. E. (2015). The enlightenment underpinnings of the public procurement profession. *Journal of Public Procurement*, *15*(4), 439–457. https://doi.org/10.1108/JOPP-15-04-2015-B002.

Kline, R. B. (2011). *Principles and practice of structural equation modelling* (3rd ed.). The Guilford Press.

Kotoka, A. F. (2012). Assessing the Level of Compliance With the Public Procurement Act 2003 , (Act 663) in Public Entities in Ashanti Region of Ghana. *Ayitey Kotoka*, *2*(3), 54–60.

https://doi.org/10.1108/14635770810915940.

Krishnan, R. C., Abu Said, A. M., Razak, M. R. A., & Ahmed, E. M. (2020). Talent management practices impact on Malaysian SMIs managers job performance. *International Journal of Learning and Intellectual Capital*, *17*(1), 1–26. https://doi.org/10.1504/IJLIC.2020.105338.

Kumar, D. S., & Purani, K. (2018). Model specification issues in PLS-SEM: Illustrating linear and non-linear models in hospitality services context. *Journal of Hospitality and Tourism Technology*, *9*(3), 338–353. https://doi.org/10.1108/JHTT-09-2017-0105.

Lam, T. Y. M. (2022). Driving sustainable construction development through post-contract key performance indicators and drivers. *Smart and Sustainable Built Environment*, *11*(3), 483–499. https://doi.org/10.1108/SASBE-07-2020-0111.

Landale, K. A. F., Rendon, R. G., & Hawkins, T. G. (2017). Examining the effects of source selection method on procurement outcomes. *Journal of Defense Analytics and Logistics*, *1*(1), 47–68. https://doi.org/10.1108/jdal-05-2017-0006

Liu, D., Xu, W., Li, H., Zhang, W., & Wang, W. (2011). Moral hazard and adverse selection in Chinese construction tender market. *Disaster Prevention and Management: An International Journal*, *20*(4), 363–377. https://doi.org/10.1108/09653561111161699.

Lundberg, S., & Bergman, M. A. (2017a). Tendering design when price and quality is uncertain. *International Journal of Public Sector Management*, *30*(4), 310–327. https://doi.org/10.1108/IJPSM-04-2016-0063.

Lundberg, S., & Bergman, M. A. (2017b). Tendering design when price and quality is uncertain. *International Journal of Public Sector Management*, *30*(4), 310–327. https://doi.org/10.1108/IJPSM-04-2016-0063.

Marcarelli, G., & Nappi, A. (2019). Multicriteria approach to select the most economically advantageous tender: The application of AHP in Italian public procurement. *Journal of Public Procurement*, *19*(3), 201–223. https://doi.org/10.1108/JOPP-05-2018-0020.

Marzouk, M. M., & Gaid, E. F. (2018). Assessing Egyptian construction projects performance using principal component analysis. *International Journal of Productivity and Performance Management*, *67*(9), 1727–1744. https://doi.org/10.1108/IJPPM-06-2017-0134.

Matto, M. C. (2023). Identifying the latent shortcomings of force account projects in Tanzania: the case of construction projects in the education sector. *Engineering, Construction and Architectural Management*, *30*(2), 787–804. https://doi.org/10.1108/ECAM-06-2021-0525.

Matto, M. C., Ame, A. M., & Nsimbila, P. M. (2021). Tender process and value for money in Tanzania public procurement. *International Journal of Logistics Economics and Globalisation*, *9*(1), 1–23. https://doi.org/10.1504/IJLEG.2021.116218.

Mchopa, A. D. (2020). Applicability of force account approach in procurement of works in Tanzania. *Journal of International Trade, Logistics and Law*, *6*(2), 137–143.

Moschuris, S. . (2015). Decision-making criteria in tactical make-or-buy issues: An empirical analysis. *EuroMed Journal of Business*, *10*(1), 2–20.

https://doi.org/10.1108/EMJB-02-2014-0010.

Mukherjee, K. (2016). Supplier selection criteria and methods: past, present and future. *Int. J. Operational Research*, *27*(1/2), 356–373. https://doi.org/10.1504/IJOR.2016.10000076.

NAOT. (2019). *Performance audit on management of construction activities on irrigation projects report* (Issue March).

NAOT. (2021). *Annual general report of the controller and auditor general on audit of the local government authorities for the financial year 2019/20*.

NAOT. (2022). *Performance Audit on the Management of Maintenance of Roads*.

NAOT. (2023a). *Annual general report of the controller and auditor general on the audit of central government for the financial year 2021/22*.

NAOT. (2023b). *Annual general report of the controller and auditor general on the audit of LGAs for the financial year 2021/22*.

NAOT. (2023c). *Annual general report of the Controller and Auditor General on the audit of public authorities and other bodies for the financial year 2021/22*.

Nguyen-Phuoc, D. Q., Oviedo-Trespalacios, O., Su, D. N., De Gruyter, C., & Nguyen, T. (2020). Mobile phone use among car drivers and motorcycle riders: the effect of problematic mobile phone use, attitudes, beliefs and perceived risk. *Accident Analysis and Prevention*, *143*(April), 105592. https://doi.org/10.1016/j.aap.2020.105592.

Nguyen, T. P., & Chileshe, N. (2015). Revisiting the construction project failure factors in Vietnam. *Built Environment Project and Asset Management*, *5*(4), 398–416. https://doi.org/10.1108/BEPAM-10-2013-0042.

Okpo, H., Ikediashi, D., & Dania, A. (2023). Influence of digitalisation adoption level on construction project delivery in Nigeria. *Frontiers in Engineering and Built Environment*, *3*(4), 221–232. https://doi.org/10.1108/FEBE-01-2023-0008.

Owusu-Manu, D.-G., Kukah, A. S., Edwards, D. J., Pärn, E. A., El-Gohary, H., & Aigbavboa, C. (2018). Causal relationships of moral hazard and adverse selection of Ghanaian Public-Private-Partnership (PPP) construction projects. *Journal of Engineering, Design and Technology*, *16*(3), 439–460. https://doi.org/10.1108/JEDT-12-2017-0137.

Özyürek, İ., & Erdal, M. (2023). Crisp and fuzzy appraisal of tenderer's qualifications in public works procurement in Turkey. *Journal of Public Procurement*, *23*(1), 78–99. https://doi.org/10.1108/JOPP-09-2021-0060.

Parker, D. W., Dressel, U., Chevers, D., & Zeppetella, L. (2018). Agency theory perspective on public-private-partnerships: International development project. *International Journal of Productivity and Performance Management*, *67*(2), 239–259. https://doi.org/10.1108/IJPPM-09-2016-0191.

PPRA. (2015). *Procurement audit manual*.

PPRA. (2019). *Report of procurement audits for fy 2018/19*.

PPRA. (2020). *Guideline for evaluation of tenders in procurement of goods, works and non-consultancy services*.

PPRA. (2022). *Annual performance evaluation report for financial year 2021/22*.

Prakash, S., Arora, A., Prakash, C., & Srivastava, A. (2023). Supplier evaluation and selection in the constrained environment of advance purchasing. *Journal*

of Global Operations and Strategic Sourcing, *16*(3), 661–682. https://doi.org/10.1108/JGOSS-12-2021-0103.

Randhawa, J. S., & Ahuja, I. S. (2017). Structural equation modeling for validating impact of 5S implementation on business excellence of manufacturing organizations. *International Journal of Quality & Reliability Management*, *34*(9), 1592–1615. https://doi.org/10.1108/IJQRM-08-2016-0129.

Rasheli, G. A. (2016). Procurement contract management in the local government authorities (LGAs) in Tanzania: A transaction cost approach. *International Journal of Public Sector Management*, *29*(6), 545–564. https://doi.org/10.1108/IJPSM-10-2015-0173.

Rector-IAA. (2023). *Rector's annual report*.

Roach, C. M. L. (2016). An application of principal agent theory to contractual hiring arrangements within public sector organizations. *Theoretical Economics Letters*, *6*(February), 28–33. https://doi.org/10.4236/tel.2016.61004.

Ryan, C. (2020). Refereeing articles including SEM – what should referees look for? *Tourism Critiques: Practice and Theory*, *1*(1), 47–61. https://doi.org/10.1108/TRC-03-2020-0002.

Sarstedt, M., Hair, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal (AMJ)*, *27*(3), 197–211. https://doi.org/https://doi.org/10.1016/j.ausmj.2019.05.003.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business*

students (8th ed.). Pearson.

Schinka, J. A., Velicer, W. F., & Weiner, I. B. (2003). *Handbook of psychology: Research methods in psychology vol. 2* (I. B. Weiner (ed.)). John Wiley & Sons.

Schotanus, F., Engh, G. Van Den, Nijenhuis, Y., & Telgen, J. (2022). Journal of Purchasing and Supply Management. *Journal of Purchasing and Supply Management*, *28*(2), 100744. https://doi.org/10.1016/j.pursup.2021.100744.

Sharma, P., Sivakumaran, B., & Mohan, G. (2022). Using Schmid–Leiman solution with higher-order constructs in marketing research. *Marketing Intelligence & Planning*, *40*(4), 513–526. https://doi.org/10.1108/MIP-01-2022-0025.

Shiau, W.-L., Sarstedt, M., & Hair, J. F. (2019). Internet research using partial least squares structural equation modeling (PLS-SEM). *Internet Research*, *29*(3), 398–406. https://doi.org/10.1108/INTR-10-2018-0447.

Silva, M., & Figueiredo, P. S. (2018). Supplier selection: a proposed framework for decision making. *Int. J. Procurement Management*, *11*(2), 233–249. https://doi.org/10.1504/IJPM.2018.090028.

Svensson, G. (2015). Contemporary process to test the theory of a research model through covariance-based structural equation modeling in business research. *European Business Review*, *27*(4), 447–458. https://doi.org/10.1108/EBR-08-2013-0104.

Taminiau, Y., & Heusinkveld, S. (2017). Role expectations and agency in the audit tendering process. *Accounting, Auditing and Accountability Journal*,

30(8), 1820–1842. https://doi.org/10.1108/AAAJ-10-2015-2258.

Tanzania Invest. (2023). *Tanzania's industrial sector*. Tanzania's Industrial Sector. https://www.tanzaniainvest.com/construction (accessed 6 March 2023)

Tutu, S. O., Kissi, E., Osei-tutu, E., & Desmond, A. (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, *12*(1), 1–14. https://doi.org/10.1504/IJPM.2019.096994.

Public Procurement Act, Pub. L. No. 410 (2011). https://www.ppra.go.tz/phocadownload/attachments/Act/Public_Procurement_Act_2011.pdf

Watt, D. J., Kayis, B., & Willey, K. (2009). Identifying key factors in the evaluation of tenders for projects and services. *International Journal of Project Management*, *27*(3), 250–260. https://doi.org/https://doi.org/10.1016/j.ijproman.2008.03.002.

World Bank. (2016). Evaluation criteria for use of evaluation criteria for procurement of goods, works, and non-consulting services. In *The World Bank* (Issue July, pp. 1–23). The World Bank. www.worldbank.org

Yukins, C. R. (2010). A Versatile prism: Assessing procurement law through the principal-agent model. *Public Contract Law Journal*, *40*(1), 63–86. http://scholarship.law.gwu.edu/faculty_publications

Zhang, Y., Luo, H., & He, Y. (2015). A System for tender price evaluation of construction project based on big data. *Procedia Engineering*, *123*, 606–614. https://doi.org/10.1016/j.proeng.2015.10.114.

Zu, X., & Kaynak, H. (2012). An agency theory perspective on supply chain quality

management. *International Journal of Operations & Production Management*, *32*(4), 423–446. https://doi.org/10.1108/01443571211223086.

APPENDICES

Appendix 1: Questionnaire Survey

Dear respondent,

My name is Mordecai C. Matto, a candidate pursuing Master of Business Administration in Transport and Logistics Management (MBA-TLM) at the Open University of Tanzania. I am conducting a study on the contractor selection process and performance of construction projects in Tanzania. This study aims to examine the determinants of contractor selection process and the performance of construction projects in Tanzania. I am therefore, seeking from you some important information with respect to your knowledge to help to draw a valid conclusion. It would be greatly appreciated if the questionnaire is answered by the staff from user departments who have participated in tender evaluation exercise. I would like to assure you that confidentiality will be maintained throughout the study. If you have question(s) regarding this questionnaire do not hesitate to contact the undersigned.

Email address: modematto@gmail.com Mobile No. +255 713 991652

SECTION A: DEMOGRAPHIC DATA

Please use a tick (√) to fill the blank to indicate your response			
1. Please indicate your gender			
Male	Female		
☐	☐		
2. Indicate the name of your department/section/unit ……			
3. How often you have participated in contractor selection process or tenders evaluation exercise?			
Once	Many	Never	
☐	☐	☐	
4. Indicate your campus			

Arusha	DSM	Dodoma	Babati	Songea

SECTION B:

Below are statements describing the attributes of contractor selection process and performance of construction projects in Tanzania context. Based on your experience of the tender evaluation procedure, rate by ticking the extent to which you agree or disagree with each attribute as applied to public procurement. Note that: 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree and 5 – strongly agree.

S/n	1. Commercial Examination of Tenders (CET)	1	2	3	4	5
	Verification (CET1)					
1	"Bid validity period" is a very important criterion in contractor selection process					
2	"Company/firm registration certificate" is a very important criterion in contractor selection process					
3	"Manufacturer authorization letter" is a very important criterion in contractor selection process					
4	"Power of attorney" is a very important criterion in contractor selection process					
	Eligibility (CET2)					
1	"Bidder originate from eligible source countries" is a very important criterion in contractor selection process					
2	"Goods and services originate from eligible countries" is a very important criterion in contractor selection process					
3	"Memorandum i.e. statement on the code of conduct and compliance programme" is a very important criterion in contractor selection process					
4	"Anti-bribery policy" is a very important criterion in contractor selection process					
	Bid securities and license (CET3)					
1	"Tender securing declaration" is a very important criterion in contractor selection process					
2	"Tender security" is a very important criterion in contractor selection process					
3	"License/permit from regulatory/oversight/professional authorities/boards" is a very important criterion in contractor selection process					

S/n	1. Commercial Examination of Tenders (CET)	1	2	3	4	5
4	"Trading license from county/city/municipal/town/district councils" is a very important criterion in contractor selection process					
	Completeness of tender (CET4)					
1	"Partial bid is prohibited" is a very important criterion in contractor selection process					
2	"Tax identification number certificate" is a very important criterion in contractor selection process					
3	"Value-added tax certificate" is a very important criterion in contractor selection process					
4	"Tax clearance certificate" is a very important criterion in contractor selection process					

S/n	2. Technical Examination of Tenders (TET)	1	2	3	4	5
	Financial Situation (TET1)					
1	"Audited financial statements" is a very important criterion in contractor selection process					
2	"Bank statements" is a very important criterion in contractor selection process					
3	"Average annual turnover" is a very important criterion in contractor selection process					
4	"Financial resources (cash-flow)" is a very important criterion in contractor selection process					
	Contract conditions (TET2)					
1	"Compliance with the technical specification" is a very important criterion in contractor selection process					
2	"Compliance with the delivery schedule" is a very important criterion in contractor selection process					
3	"Compliance with work schedule/plan" is a very important criterion in contractor selection process					
	Experience (TET3)					
1	"General firm experience" is a very important criterion in contractor selection process					
2	"Specific firm experience (on similar assignment in terms of physical size, complexity, methods/technology)" is a very important criterion in contractor selection process					
3	"History of non-performing contracts" is a very important criterion in contractor selection process					
4	"Litigation history" is a very important criterion in contractor selection process					
	Resource capability (TET4)					
1	"Key personnel qualification" is a very important criterion in contractor selection process					

S/n	2. Technical Examination of Tenders (TET)	1	2	3	4	5
2	"Key personnel experience" is a very important criterion in contractor selection process					
3	"Key equipment to undertake the project" is a very important criterion in contractor selection process					

S/n	3. Financial Examination of Tenders (FET)	1	2	3	4	5
	Corrections of arithmetical errors (FET1)					
1	"Price read-out" is a very important criterion in contractor selection process					
2	"Corrections of arithmetical errors" is a very important criterion in contractor selection process					
3	"Conversion into single currency" is a very important criterion in contractor selection process					
	Lowest evaluated bid price (FET2)					
1	"Additions to the read-out price" is a very important criterion in contractor selection process					
2	"Adjustments to the read-out price" is a very important criterion in contractor selection process					
3	"Price deviations to the read-out price" is a very important criterion in contractor selection process					
4	"Bidder's rank" is a very important criterion in contractor selection process					
5	"Due diligence or post-qualification" is a very important criterion in contractor selection process					

S/n	4. Performance of construction projects (PCP)	1	2	3	4	5
1	Quality aspects of construction projects in public entities are efficiently achieved					
2	Cost-efficiency of construction projects in public entities is efficiently achieved					
3	Time aspects of construction projects in public entities is efficiently achieved					
4	Customer satisfaction on the construction projects in public entities is efficiently achieved					
5	Project objectives in our entity is efficiently achieved					
6	Customer satisfaction on the construction projects in public entities is efficiently achieved					
7	Awards of construction projects based on the prevailing market price in public entities is efficiently achieved					

S/n	4. Performance of construction projects (PCP)	1	2	3	4	5
8	Public interest in construction projects in public entities are efficiently achieved					

Appendix 2: Research Clearance

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/PG202101219 **10th June, 2024**

Rector,

Institute of Accountancy Arusha,

P.O.Box 2798,

ARUSHA.

Dear Rector,

RE: RESEARCH CLEARANCE FOR MORDECAI CHRYSOSTOM MATTO REG NO: PG202101219

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. Mordecai Chrysostom**

Matto Reg.No: PG202101219), pursuing **Master of Business Administration in Transport and Logistics Management (MBA T&LM).** We here by grant this clearance to conduct a research titled **"Effect of the Determinants of Contractor Selection Process and Performance of Construction Projects In Tanzania: A Case of Institute of Accountancy Arusha.** He will collect his data at your office from 11th June to 30th July 2024.

4. In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: VICE CHANCELLOR

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF FINANCE

INSTITUTE OF ACCOUNTANCY ARUSHA

REF.NO: AC.410/456/01/105 **19TH JUNE, 2024**

Mordecai C. Matto,
Institute of Accountancy Arusha,
P.O.BOX2798,
ARUSHA.

Dear Dr. Matto

RE: DATA COLLECTION.

Kindly refer to the above heading and your request dated 11th June, 2024

2. You are here by informed that, your request has been accepted to collect data at the Institute for your research titled: **"The Determinants of the Contractor Selection Process and Performance of Construction Projects in Tanzania: A case of Institute of Accountancy Arusha".**

3. Wishing you all the best

DR. CAIRO P. MWAITETE
FOR: RECTOR

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