ORIGINAL RESEARCH ARTICLE

Evaluation of public procurement procedures for construction projects in Kenya: A contractor selection system based on project performance.

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ABSTRACT

Contractor selection is one of the main activities undertaken by state-procuring entities. Without a proper and accurate method for selecting the most appropriate contractor, the performance of the construction project will be affected. It is indeed important that capable contractors with appropriate attributes are selected to ensure that construction project performance is not put at risk. This study is aimed at evaluating the contractor selection procedures that are used during the tender evaluation process. The significance and the relationship between the contractor's selection procedures and project success performance were determined based on a questionnaire survey. A quantitative and qualitative research strategy and a cross-sectional survey design were used. A stratified random sampling was adopted to determine the proportion of each stratum for the 263 sample size from a target population of 841 public projects that formed the unit of analysis. The data was analysed for multicollinearity, descriptive, multiple regression, and a test of significance computed at 0.05 level of significance. Descriptive statistics results revealed that financial soundness, technical capacity, experience, quoted tender price, management capability, and government statutory requirements are the most appropriate variables in tender evaluation. The hypothesis was stated in null form, for which the following results were recorded: ($F(2,155)=17.218$, $p=0.000$) and ($F(2,154=10.828, p=0.000$) thus rejected hypothesis. A stepwise multiple regression model was derived based on dependent variables and independent variables to determine whether there is a relationship between the variables. The goodness fit of the model, as defined by the value of R-square (0.123), was found to be 12.3%. It was therefore, concluded that financial soundness and technical capacity are statistically significant variables that suggest that the variables explain the construction project success. The study is significant in that it provides specific variables to procuring entities and construction contractors with recommendations of better evaluation of tenders both financially and technically.

Keywords: construction project; contractor selection; selection procedures

1.0 Introduction

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Proper selection of contractors using the public procurement procedures contributes to project success. Therefore, it is important to select appropriate contractor at the tender evaluation process. The appropriate selection of the contractor will always be in the interest of state entity and the contractor will also benefit in the long run. A competent contractor is one of the indispensable conditions of a project's successful performance on budget, delivery on time, achieving specifications, public entity's satisfaction, meeting environmental sustainability, and fulfilling public needs (Elsayah, 2016). Several factors contribute to construction project success, and one of the essential elements is contractor selection procedures, a procurement-related factor (Sagib, Farooqui, & Lodi, 2008). Traditionally, scholars and practitioners have focused on budget, time, and quality as project success performance. Contractor selection is a critical activity that plays a significant role that contributing towards the satisfactory performance of any construction project, and it is the most challenging decision for the client. The contractor selection process occurring early in the project life cycle is perhaps one of the most important undertakings performed by procuring entities, the effectiveness of which is directly related to project success (Watt, Kayis, & Willey, 2010). In a study conducted in Kenya to develop a framework influencing the success of constituency development fund construction projects, Ngacho (2016) identified procurement-related factors that relate to the contractor's capability as a dominant factor (Ngacho & Das, 2016). Procuring state entities guided by a legal policy framework should be able to identify construction projects in line with state entity objectives and select appropriate contractor to complete the project successfully.

In Kenya, large numbers of construction projects have failed because of a lack of competence and ability of the contractors, which hurt the Vision 2030 development Agenda and the growth of the nation (Mushori, Rambo, & Wafula, 2019). The construction sector in most developing countries has acquired a poor reputation for being unable to achieve project objectives on time, within budget, and according to the predetermined quality standard (Thomas, Ekambaram, & Kumaraswamy, 2002). An attempt has been made in Kenya to improve the efficiency and effectiveness of the contractor evaluation process, with the introduction of Kenya's Public Procurement and Asset Disposal Act (GOK, 2021) to enhance the achievement of the project objectives, but this has not always been the case (Wahome, Wanyona, & Wachira, 2013). The legal policy framework in Kenya has failed to address many aspects of the procurement of construction projects during the tendering process, leading to unfair competition, corruption, and subversion of law, thereby compromising effective contractor selection (Kagume & Wamalwa, 2018). Indeed, numerous methods for analyzing and evaluating contractors are currently employed by different public procuring entities such as scoring method, lowest tender, average, and ten percent above or below engineers estimate.

The contractor performance variables of construction projects include financial capability, technical capability, occupational health, and safety, management capabilities, and reputation (Thomas *et al.,* 2002). The determination of the suitability of a contractor through bid evaluation

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is a highly significant part of the public procurement procedure. Under the public procurement system is the long-standing policy recommendation that open tendering be the preferred procedure for determining the suitability of the contractor, a bid is awarded to the lowest responsible and responsive bidder. The "responsiveness" means that the tender meets all the material terms of the solicitations requirements as outlined in the terms of reference (TOR) or request for proposal (RFP). On the other hand, "responsibility" means that the bidder has the financial capacity, technical capacity, experience, management capability, good track record on quality management, environmental health, and safety (EHS) guidelines, compliance with authority statutory requirements, organization and governance, and innovation capacity. Consequently, the clients should base their choice of contractor on a value-for-money basis with proper weighting of selection variables (Latham, 1994). The 1994 report by Sir Latham's Construction Review provided an in-depth analysis of procurement trends, specific failings of procurement procedures, and contractor selection. While many improvements have been made in the public procurement procedures, this research paper focused on evaluating the key contractor selection variables that affect construction project success in state entities in Kenya.

1.2 Theoretical framework

1.2.1 Construction management theory

The use of theories in construction management research is unique and different from other fields of research (Olubunmi, Olanipekun, & Xia, 2017). In contrast to many fields of research, there is no universal and explicit theory of construction management. The research in the field of construction management and economics can be characterized as a multidisciplinary design science. Results from the sciences and humanities are necessary inputs for this field of research that deals with the design, production, and operation of the built environment. Previous attempts to develop an explicit construction management theory have been unsuccessful (Koskela, 2000). Koskela (2002), in his theoretical foundation, explains the novel features of construction management; for instance, the transformation flow-value (TVF) theory conceptualized construction as a production activity that consists of the transformation of production factors into finished products following specific processes to deliver value to the end user. From the context of this study, the theory is useful in studying the contractor project success variables that form the functions of a contractor. The theory of construction management is based on a "tool kit of concepts and relationships" that will improve the efficiency and quality of construction products. In conclusion, the construction management theory unveils the argument that construction management aims at the efficient and effective completion of construction projects within the set objectives. It all begins with the selection of competent contractors and other production team members. The theory acknowledges the importance of the contractor's attributes that contribute to the success of the project. Hence, the theory is useful in this study, more specifically, to test the relevance of the predictor variables.

1.2.2 Public value theory

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Public Value theory(PVT) was formulated by Moore (1995) to provide public sector managers with greater understanding of constraints and opportunities within which work, and the challenge to create publicly valuable outcomes (Moore, 1995). Public values is combining safeguards and enriching the 'public sphere' with the delivery of 'what is the public value'. Moore (1995), posits that the public entities must ensure that the services they offer to the public must be of the highest quality and acceptable. The theory is important in explaining how the implementation of public procurement policies is envisaged to create value for money. The theory applied to this study, the selection of contractors for public construction projects must ensure that only the most appropriate and qualified contractors are selected to provide the best public value. However, public construction projects play an important role in social economic development in Kenya, and in view of the fact that the state entities have an important role in implementing the public construction projects. The decisions that the state entities make in procuring must first and foremost ensure that the public gets value for money. Additionally, the procurement decisions that are made and the contractors awarded the contracts must meet all the variables and, hence, are most appropriate to implement the contract.

2.0 Methodology

2.1 Sampling

The study was conducted in state entities in Kenya. In total, there are 261 Kenyan state entities as per the Inspectorate of State Corporations _(GOK., 2013) spread out all over the country. The research study focused on construction projects (buildings, roads, bridges, dams, sewerage, and water supply) in all state corporations which are classified into five categories: Purely commercial state corporations, State corporations with strategic function, State Agencies-Executive Agencies, State Agencies- Independent Regulatory Agencies, State Agencies and Research institutions, Public Universities, Tertiary Education Training institutions. Stratified random sampling was used to determine the sample size. Using stratified sampling method to obtain the size of each stratum sums up to give the total construction projects that formed the sample size (Table 2.1). A quantitative and qualitative research strategy and cross-sectional survey research design were adopted. From Table 2.1, of the target population of 841 construction projects, 263 construction projects were sampled using stratified technique for investigation as follows: Purely Commercial State Corporation (1 project), State Corporation with Strategic Function (8 projects), Executive Agencies (174 projects) State Agencies-Independent Regulatory Agencies (17 projects), and Research Institutions, Public Universities & Tertiary Education and Training (63 projects). The sample size was calculated using Fisher's (1935) formula suggested by _(Mugenda & Mugenda, 2003) as shown below;

$$\text{nf} = \frac{Z^2 pq}{e^2}$$

Where: nf= population;

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Z= table value from the normal table;
P= probability of success
q= (p-1) probability of failure;
e= allowed error;
nf= $\frac{(1.96)^2\,(0.5)\,(0.5)}{(0.05)^2}$ = 384

According to the Fisher formula, when the population size is less than 10,000, the sample size (nf) can be calculated as follows: Where: nf = desired sample size (when the population is less than 10,000); N= the estimate of the population size. Using proportional allocation, the proportion of the size for each stratum is added together to give the total sample size. Table 2.1 depicts how the number of construction projects was achieved.

Table 2.1: Sample size determination

Stratum	Construction projects	Sample size	Per cent
Purely Commercial State Corporation	3	$\frac{263}{841}x\,3$= 1	0.380%
State Corporation with Strategic Functions	25	$\frac{263}{841}x\,25$=8	3.042%
Executive Agencies	559	$\frac{263}{841}x\,559$=174	66.16%
State Agencies –Independent Regulatory Agencies	53	$\frac{263}{812}x\,53$= 17	6.46%
Research Institutions, Public Universities & Tertiary Education & Training	201	$\frac{263}{841}x\,201$=63	23.95%

Source (Authors, 2022)

The study was delimited to building and infrastructural construction projects with a contract value above a hundred million, which is the minimum contract value for building contractors under category NCA5 and unlimited value in category NCA1 registered and licenced by the National Construction Authority. The projects under consideration were projects procured since the operationalization of the Public Procurement and Asset Disposal Act (GOK, 2021). The respondents' identification in each project in the organization were formally identified and contacted through the researcher formally writing to the department head requesting for respondents' assistance in answering the questionnaire. The respondents were members of the tender evaluation committee in the state entities who were involved in construction project bid evaluation and were given the questionnaires to fill and include: procurement officers, architects, engineers, quantity surveyors, and project managers. The respondents indicated that they prefer to remain anonymous. The study recorded an overall questionnaire response of 71.86 percent

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(Table 2.2). The response rate of 71.86% in the current study, therefore, met the criteria set by Mugenda and Mugenda (2003) which is 50% and 70% respectively.

Table 2.2: Respondents response rate

Strata	Sample size	Response	percentage
State Agencies -A purely commercial state corporation	1	1	100%
State corporations with strategic function	8	6	75%
State Agencies-Executive Agencies	174	153	87.90%
State Agencies- Independent Regulatory Agencies	17	8	47%
State Agencies-Research institutions, public Universities, Tertiary Education training institutions	63	21	33%

Source: Author (2022)

2.2 Respondent professional background

Table 2.3 shows the respondent's professional background. Four point eight percent of respondents were project managers, forty-one point three percent were engineers, twenty-two point eight percent were procurement officers, eighteen point five percent were architects, and twelve point seven percent were quantity surveyors.

Table 2.3: Professional background

Professional	Frequency	Valid Percent
Project manager	9	4.8
Engineer	78	41.3
Procurement officer	43	22.8
Architect	35	18.5
Quantity Surveyor	24	12.7

Source: Author (2022)

2.3 Multicollinearity test for study variable

The study conducted a Multicollinearity diagnostic test to ensure that the accepted explanatory variables did not exhibit collinearity. Multicollinearity can occur in multiple regression models in which some of the predictor variables are significantly correlated among themselves. A situation in which there is a high degree of association between predictor variables is said to be a problem of multicollinearity, which results in large standard errors of the coefficients associated with the affected variables. The variance inflation factor (VIF) assesses how much the variance of an estimated regression coefficient increases when explanatory variables are correlated. If no factors are correlated, the VIFs will be one.

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Table 2.4: MultiCollinearity statistics test

Model	Collinearity Tolerance	ViF
Reputation	.825	1.212
Technical Capacity	.471	2.124
Financial soundness	.400	2.498
Management capability	.914	1.094
Quality Management	.502	1.991
Quoted tender price	.651	1.536
Occupational health and safety	.360	2.780
Innovation ability	.378	2.645
Experience	.533	1.877
Environmental sustainability	.170	5.866
Social safeguards	.189	5.278
Organization and governance	.333	3.006
Government statutory requirements	.609	1.643

Source: Author (2022)

As indicated in Table 2.4, the tolerances are all above 0.2 except for environmental sustainability and social safeguards. The variance inflation factors are all below 10. Multicollinearity is associated with VIF above 5 and tolerance below 0.2. In summary, the accepted predictors were therefore determined not to exhibit multi-collinearity and therefore fit to be used for analysis.

3.0 Results

3.1 Contractor selection requirements

The research sought to know the contractor selection documents used by the state entities when procuring construction projects in Kenya. Table 3.1 shows descriptive statistics on contractor selection documents of 186 respondents who specified the documents they used in the selection of contractors for the construction project handled. A Likert scale of 1 to 5 was used, and for interpretation purposes, the mean score of 1 indicates "not appropriate", 2 is "least appropriate", 3 is "moderately appropriate", 4 is "appropriate", and 5 is"highly appropriate". A lower mean value indicates a lower level of appropriateness on contractor's selection variables affecting project success performance. The standard deviation (SD) is regarded as a measure of dispersion in a data series about the mean. Low, or small SD indicates data are clustered tightly around the mean, and high, or large, SD indicates data points are more spread out. In this case, a SD close to zero

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indicates that data points are very close to the mean, whereas a large SD indicates data points are spread further away from the mean. The specified documents had a weighted mean value ranging from 0.975 to 0.749 with a low SD indicating a high degree of consistency in respondent's opinions. The first top ten documents are: NCA registration had a weighted mean (0.975), Valid tax compliance certificate from KRA (0.898), Priced bills of quantities (0.969), Duly filled form of tender (0.954), Current business permit (0.944), dully filled form of tender security (0.944), instructions to tenderers (0.944), duly filled form of invitation to tenders had a mean of 0.943, litigation history (0.938), serialization of tender documents (0.918).

Table 3.1: Descriptive statistics ranking contractor selection documents

Contractor selection documents	N	Mean	Rank	SD
NCA registration	196	.975	1	.158
Valid Tax compliance certificate from KRA	195	.974	2	.159
Priced Bills of Quantities	196	.969	3	.172
Duly filled form of tender	195	.954	4	.210
Current business permit	196	.944	5	.231
Duly filled form of Tender Surety	196	.944	6	.231
Instructions to Tenderers	196	.944	7	.231
Duly filled form of Invitation for Tenders	194	.943	8	.232
Litigation history	194	.938	9	.242
Serialized tender documents	195	.918	10	.275
Declaration form	194	.907	11	.291
Drawings	195	.903	12	.810
Valid pin	196	.898	13	.304
VAT registration certificate	196	.872	14	.334
Confidential Business Questionnaires	196	.847	15	.361
Preliminaries	196	.842	16	.366
Specifications	196	.832	17	.375
Methodology	195	.800	18	.401
Duly filled out acceptance letter,	195	.785	19	.412
Duly filled form of agreement,	195	.764	20	.426
Performance bank guarantee	195	.759	21	.429
Method statement	195	.749	22	.435

Source: Author (2022)

3.2 Contractor selection procedures

Figure 3.2 shows the procurement methods used to procure construction projects in public entities in Kenya. There were zero projects procured using the restricted procurement method, followed by two projects through the contractor prequalification method, 186 construction projects procured using the open tendering method, one construction project through a two-stage tendering system, and two procured using other methods such as public-private partinership. The qualitative results revealed that the most commonly used method for selecting contractors in a Kenyan government project is through open tendering (97%) as entrenched in Public Procurement and the Asset Disposal Act of 2015. Public sector clients typically select a contractor using the lowest price- open tendering method to ensure public value for money. However, there were two

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others procured in different methods; for instance, the public-private partnership system that was used to procure projects in compliance with the Private Partnership Act of 2013 (GOK, 2021).

Table 3.2: Statistics on procurement method

Procurement method	
Restricted tendering	0
Selected (prequalification)	2
Open tendering	186
Two-stage tendering	1
Public Private Partnership(others)	2

Source: Author (2022)

Table 3.3 shows the rating by respondents on the appropriateness of the main variables used in the contractor selection in public construction projects in Kenya. Table 3.3 depicts the weighted mean value range: 3.42-4.93, indicating that the contractor selection variables were all appropriate. The Likert scale of 1 to 5 was used, and for interpretation purposes, the mean score of 1 indicates "not appropriate", 2 "least appropriate", 3" moderately appropriate", 4 "appropriate", and 5 "highly appropriate". A lower mean value indicates a lower level of appropriateness on contractor's selection variables affecting project success performance.

Table 3.3: Descriptive Statistics on contractor selection procedures

Main Variables	N Statistics	Mean Statistics	Rank	SD Statistics
Financial soundness	192	4.93	1	3.686
Technical Capacity	191	4.78	2	.510
Experience	193	4.73	3	2.944
Quoted tender price	188	4.54	4	.790
Management capability	191	4.51	5	2.982
Government statutory	185	4.50	6	.848
Quality management	190	4.41	7	.841
Occupational health and safety	188	3.95	8	1.001
Environmental sustainability	189	3.76	9	1.205
Reputation	176	3.64	10	1.258
Social sustainability	189	3.57	11	1.208
Organization and governance	181	3.44	12	1.240
Innovation ability	186	3.42	13	1.255
Composite mean and SD		4.17		1.520

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Source: Author (2022)

The research findings revealed seven most commonly used variables used by procuring entities to select contractors in Kenya. These are: financial soundness with a mean value of 4.93, technical capability with a mean of 4.78, experience with a mean of 4.73, quoted tender price of 4.54, and management capability with a mean value of 4.51, government statutory requirement with mean of 4.50, and quality management with mean value of 4.41. These findings were consistent with Watt *et al.(*2010) who did a study on the relative importance of tender evaluation and contractor selection variables; (Mohammed, et al., 2013) did a study on contractor selection model for highway projects using integrated simulation and analytic network process and Doloi *et al.,* (2009) studied on structural decision model for assessing the impact of contractor's performance on project success. The research corroborated the findings of Liu, et al., (2015), which identified the key contractor characteristic factors from a project delivery system perspective (Liu, et al., 2015). A previous study by Mushori (2019) in Kenya indicated that the financial ability of contractors significantly influences the performance of road construction projects. The technical capability was rated second overall with a mean value of 4.78 with a high consistent score of SD 0. 509 which indicates that the respondents' views were consistent. This is consistent with Watt *et al., (*2010) findings. The experience of the contractor was considered as an appropriate variable for contractor selection and ranked third overall with a mean value of 4.51, with an SD 2.94, which indicated uniformity of the contractors'' views in the assessment of the variables. This is consistent with Mohammed *et al*., (2013) findings in his study, which indicated that contractor experience with a similar type of projects was ranked fourth global weight as the main variable. Table 3.2 shows that 188 respondents responded to the contractor selection variables, the quoted tender price was ranked fourth overall and had a mean value of 4.54, followed by management capability with a weighted mean value of 4.51 and government statutory requirements with a weighted mean value of 4.50, all highly appropriate.

Results in Table 3.3 reveal the mean of thirteen variables used to generate data on appropriate variables, used in construction project contractors' selection at the tender evaluation stage, were summed up and used to compute mean and standard deviation that resulted to 4.17 and 1.52 respectively. This shows that the overall contractors' selection variables were statistically significant. Measured on a 5-point Likert scale, this is average results which entail that the combined contractors' variables are commonly used by public entities in the selection of contractors in Kenya. The financial soundness, technical capacity, experience, quoted tender price, government statutory requirements, and quality management ability of the contractor have composite mean value greater than 4.17 and a low SD of less than 1.52. However, contractors' financial soundness had the highest mean value 4.93, and a combined mean of 4.17 an indication that the variable was statistically significant with a high SD revealing inconsistency in respondents' opinions. Like Mushori et al. (2020), the financial capability of the contractor had statistical significance with project performance. There is need for more effort into education and

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capacity building on contractors' selection attributes such as health and safety records, environmental sustainability, reputation, social sustainability, organization and governance, and innovation ability which have lower computed composite mean to ensure that the variables are adhere to by contractors for success performance of the project

3.4 Multiple regression analysis

This study used step-wise regression analysis to obtain the best combination of contractor selection variables build up hieratically amongst the thirteen predictor variables to determine the optimal model. Table 3.4 depicts step-by-step regression results that revealed a 1-unit increase in X_1 leads to a 0.326-unit increase in Y. In model 2 a one-unit increase in X_1 leads to a 0.223-unit increase in Y when the effect of of X2 is held constant. Hence, the financial soundness of the contractor can be relied on to successfully deliver the project. For a one-unit increase in X_2 Y increases by 0.179 when the effect of X_1 is controlled. The study further carried out multiple regression analysis to establish the statistically significant relationship between the aggregated project performance criteria (Y) (project performance index) namely: budget, time, quality, environment, procuring entity satisfaction, and public need) the project success performance index and the independent variables notably, government statutory requirements, reputation, quality Management, quoted tender price, technical capability, social safeguards, experience, management capability, health and safety, financial soundness, corporate governance, innovation ability, and Environmental sustainability. The project performance index Y is the aggregated(mean) value of all the six project performance criteria (performance by budget, time, public entity satisfaction, environmental sustainability, quality specifications, and fulfilling public needs). This was determined by demarcating the weighted values Likert scale from 1 to 5 in four non-overlapping spaces to determine the success or failure. By taking values 1 to 3.4 as failure 0 and 1 (success) taking the range 3.4-5 where the successful projects and failed projects were determined. Multiple regression analysis for all variables is presented in a systematic manner starting with the model summary, Analysis of Variance (ANOVA), and finally by beta coefficients respectively. The study used step-wise analysis to obtain the best combination of variables.

Table 3.4: ANOVA and Model Summary

Anova

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	7.342	1	7.342	17.218	000[a]
	Residual	66.097	155	.426		
	Total	73.439	156			
2	Regression	9.054	2	4.527	10.828	.000[a]
	Residual	64.385	154	.418		.
	Total	73.439	156			

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.316[a]	.100	.094	.65302
1	.316[a]	.123	.112	.64660

a. Predictors: (Constant), X13, X7, X9, X10, X2, X1, X4, X12, X3, X8, X6, X5, X11

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b. Dependent Variable: Project Perf Index
Source: Author (2022)

Table 3.5: Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std.Error	Beta		
1	(Constant)	2.653	.327		8.123	.000
	X1	.326	.079	.316	4.149	.000
2	(Constant)	2.311	.365		6.333	.000
	X1	.223	.093	.216	2.401	.018
	X2	.179	.089	82	2.023	.045

a. Dependent Variable: Project Perf Index

Source: Author (2022)

The results of ANOVA in Table 3:4 established that the model was statistically significant (F(2,155)=17.218, p<0.000) and (F(2,154=10.828,p<0.000). This is supported by the coefficient of determination, also known as the R-square of 0.123 from Table 3.5. This model X_1 and X_2 explained 12.3% of the variation in project performance. R-squared is a measure of goodness fit. The R-squared is low, but the model is still statistically significant, which was the objective of the study. The model represents the reality on the ground; for example, political interference and corruption in the public procurement process are some of the variables with an effect on building and infrastructure project performance that may require investigation. From Table 3.5, X_1 and X_2 explain the predictors in reality that, only 12.3% of the variation in project performance index. The other variables were not found relevant in the step-wise regression model. This could mean that there are other factors that were not captured in the study that could explain the remaining part of the project performance index(PPI). Since for each variable, the correlation coefficient between project performance index(PPI) and the predictor variables conveyed the same information in a non-parametric fashion of the same, a linear relation between the variables and project performance index is almost confirmed. The scatter plot matrix in Figure 3.1 is provided to depict this relationship. There is a linear relationship between the studied variables and the project performance index.

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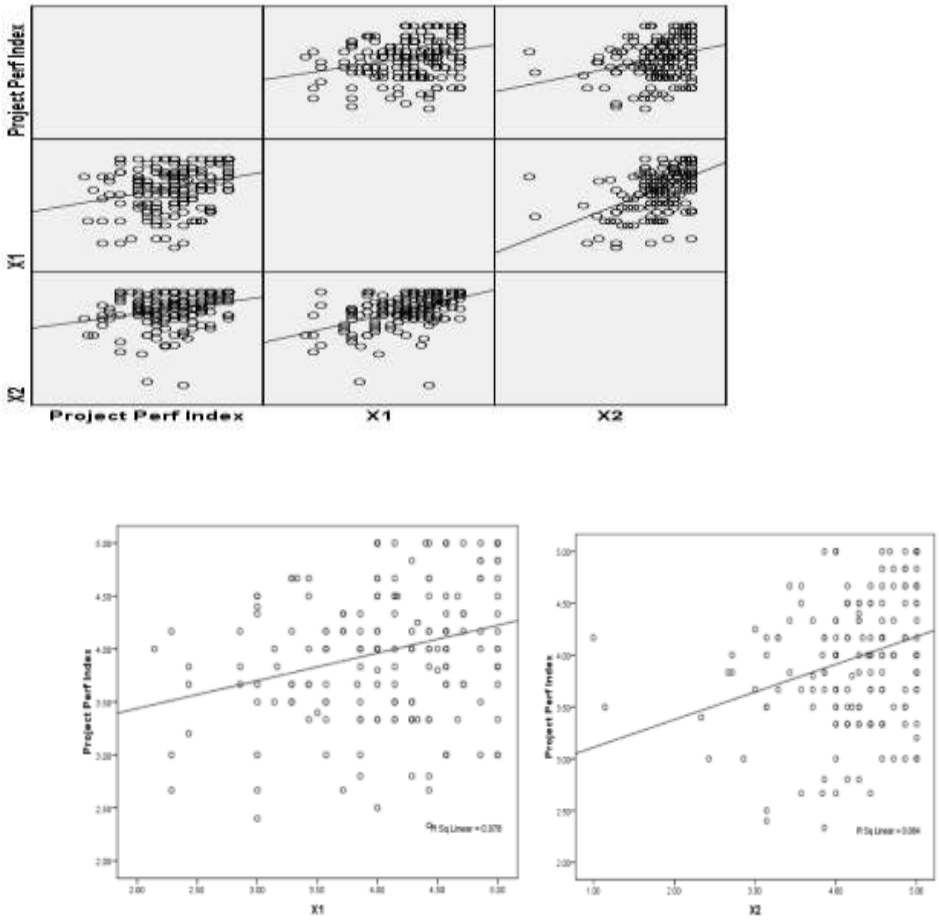

Figure 3.1: Scatter Plot Matrix X_1, X_2 and project performance index
Source: Author (2022)

The researcher investigated the scatter plot between the independent and dependent variables, and there was no suggested non-linear relationship. The researcher was not interested in the level of performance but whether there were certain variables that have predictive role in the performance of building and infrastructural projects. From the model it implies that, 87.7% of the variation in the project performance index cannot be accounted for and can be explained by variables not captured in this model which need to be investigated. This indicates that there is a 12.3% relationship between the dependent and the independent variable. In all the projects studied, their performance is not due to the 13 variables, other variables need to be studied. Using the statistical findings, the stepwise multiple regression model is as follows: The model fitted is performance,

$$Y=2.311 + 0.223X_1 + 0.179X_2$$

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For one unit increase in X_1 performance index increased by 0.223 units, X_2 is controlled. For one unit increase in the X_2 performance index increases by 0.179 when the effect of X_1 is controlled. The multiple regression analysis reveals that the financial soundness (X_1) and technical capacity (X_2) of the contractor have a significant influence on project performance and even the extent to which that is explained is 12.3%. The non-disclosure of important information by some respondents particularly on bid evaluation considered a sensitive matter in public entities may have led to inconsistency in data and therefore validation was not easy. This finding is consistent with past research by (Doloi, 2009) who used multiple regression analysis to identify the relationship between the contractor's selection variables (Quality Management, Quoted tender price, Technical capability, Experience, Management capability, health and safety, Financial soundness) and the dependent variables associated with the project's success. An important consideration is the contractors financial soundness, which has a significant impact on project performance. However, in contrast Doloi (2009) used time, cost, and quality as dependent variable while this study has introduced three more dependent variables that is:public entity satisfaction, public needs and environmental sustainability.

4.0 Discussion

The findings from the descriptive analysis revealed public construction contractors' selection variables from the engineers, architects, quantity surveyors, project managers, and procurement officers' opinions. The analysis indicates that financial soundness, technical capability, experience, management capability, quoted tender price, government statutory requirements, quality management, and health and safety are the most appropriate variables usually considered by public clients in Kenya. Public clients take a keen interest in the contractor's capability, evidenced by financial capacity, technical capacity, experience, Management capability, the quoted tender price, statutory requirements, quality management, and safety and health as variables in determining the project performance. This study is consistent with Mohammed et al (2013), Watt *et al.(*2010), and Doloi (2009), who asserted that the contractor's technical expertise, financial position, reputation, quoted tender price, and management capacity are highly critical factors for achieving success on projects. However, this is contrary to a study that was done in Singapore, where it was found that the quoted tender price was the most significant variable influencing public project performance (Singh & Tiong, 2006). On further analysis using stepwise regression to obtain the best combination of contractor's selection variables, it was found that financial soundness and technical capacity were the most significant variables in determining the project success performance, as opined by Mushori (2019). The model revealed that a unit increase in contractor's financial capability (financial ratio, bank resources, an average annual turnover, working capital) will lead to a 0.326-unit increase in project success performance. The study also established that the technical capacity (0.179) of a contractor does not have much influence on the performance of construction projects. This resonates very well with Ntuli et al., (2014) that regardless of the amount of technical resources dedicated to the contractors, it would add no

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much value if tender awards are given to those who do not have technical capacity (Ntuli & Allopi, 2014).

5.0 Conclusion and Recommendations

The study objective was to evaluate public procurement procedures for construction projects, focusing on the contractor selection system based on construction project performance. The most dominant variables for contractors' selection at the tender evaluation stage were financial soundness, technical capacity, experience, quoted tender price, government statutory requirements, and quality management. Further, the results of this study reveal that the financial soundness and technical capacity of contractors influence the performance of public building and infrastructural projects. The stepwise regression analysis showed that: ($F(2,155)=17.218$, $p<0.000$) and ($F(2,154=10.828, p<0.000$). The results of the test: $p<0.000 < 0.05$ an implication that the model was significant and as such rejected the null hypothesis. The R squared, 0.123 implied that the financial soundness and technical capacity of contractors explained 12.3% of the variation in the performance of construction projects. This is a pointer that financial soundness and technical capacity had statistically significant influence on building and infrastructural projects performance in Kenya. While contractors' technical capacity (0.179) is found to have negligible influence on project success, financial soundness certainly influences project performance and, therefore, can be relied on to successfully deliver the project. Based on the findings that the financial soundness and technical capacity of contractors only account for 12.3% variation in the total performance of construction projects, we recommend that the contractors' variables would be best used to explain performance at the completion stage of the construction projects. Other variables need to be studied to find out where failure in public projects performance. The study signifies the importance of a multi-variables evaluation system for the selection of contractors as provided in the Public Procurement and Asset Disposal Act of 2015 and be recognized as significant for the successful performance of construction projects. For further studies, a similar study to be conducted at county governments, specifically on public building projects and private sector with similar building and infrastructure projects.

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