CAPACITY OF LOCAL CONTRACTORS AND PERFORMANCE OF ROAD PROJECTS IN NAIROBI CITY COUNTY, KENYA

BRIAN WANGWE SIMIYU
D53/CTY/PT/32638/2015

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE DEGREE OF MASTERS OF BUSINESS ADMINISTRATION (PROJECT MANAGEMENT OPTION) OF KENYATTA UNIVERSITY

NOVEMBER, 2018
DECLARATION

DECLARATION BY STUDENT
This research project report is my original work and has not been submitted for a degree course or any other award in any other University. No part of this report should be reproduced without the authority of the author and/or Kenyatta University

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BRIAN WANGWE SIMIYU
D53/CTY/PT/32638/2015

DECLARATION BY SUPERVISOR
This work has been undertaken and submitted for examination with my approval on behalf of Kenyatta University

Signature _______________________                          Date _________________________

Dr. Lucy Ngugi
Department of Management Science
School of Business
Kenyatta University
DEDICATION

I hereby dedicate this MBA project to my parents WO1 Eliud Nalyanya Ndelema (MCC Defence Headquarters P/L) and Jane Nafula Taracha for their love of education, moral support and motivation. I also dedicate this work to my family at large with special mention of my four brothers Edwin Wekesa (Achievers School of Professional Studies- Nakuru), Victor Ndelema (Dept. of Engineering Kisumu polytechnic), and Elvis Barasa (School of Humanities- KU).
ACKNOWLEDGEMENT

Acknowledgements are made to those who accorded me intellectual among other relevant input in the course of development of this study. Deserving special mention is my supervisor, Dr. Lucy Ngugi, for her insights that shaped this work; Ken Mukuyi (Director Curtis Construction) for his noble guidance and genuine support; Raymond Kiptabut (Quantity Surveyor), Michael Mbotu (KU), Lt. Humphrey Mage (MAB), Engineer Quintine Ochola (WASH) and Sydney Khisa for their moral and social support, without forgetting SSGT Benjamin Menjo and Dominic Mutwol for always believing in me.
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<th>Full Form</th>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>KRA</td>
<td>Kenya Roads Authority</td>
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<tr>
<td>KURA</td>
<td>Kenya Urban Roads Authority</td>
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<tr>
<td>NCA</td>
<td>National Construction Authority</td>
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<tr>
<td>NEPAD</td>
<td>New Partnership for Africa’s Development</td>
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<td>NEMA</td>
<td>National Environmental Management Authority</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<td>UNCTAD</td>
<td>United Nations Commission for Trade and Development</td>
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## OPERATIONAL DEFINITION OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Contractors’ Capacity</td>
<td>refers to the ability of the contractors to meet the various the regulatory, financial, organizational, and technical obligations, among other obligations in a project.</td>
</tr>
<tr>
<td>Compliance Capacity</td>
<td>refers to the ability of the contractors to honor all the requirements in law by different statutory organizations</td>
</tr>
<tr>
<td>Financial capacity</td>
<td>refers to ability to satisfy both short and long term obligations to the satisfaction of all the stakeholders</td>
</tr>
<tr>
<td>Organizational Capacity</td>
<td>refers to the contractors’ competence in making and implementing work plans that satisfy the needs for road construction projects.</td>
</tr>
<tr>
<td>Technical capacity</td>
<td>refers to the ability to have staff and machinery to carry out specialized road construction projects.</td>
</tr>
<tr>
<td>Local Contractor</td>
<td>refers to a firm registered to construct roads in Kenya and has no attachment or contractor obligations outside the county</td>
</tr>
<tr>
<td>Performance of projects</td>
<td>refer to the ability to undertake the road construction work in accordance to the expected standards, quality, time and budget</td>
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ABSTRACT
Roads create a transportation network that gives shape to the living environment of people through various connectivity elements in our society. The constructions of the roads have been met with challenges of poor quality, delays and cost escalations; all of which are the parameters for performance. The study investigated the effects local contractors’ capacity on the performance of road projects in Nairobi City County, Kenya. The specific objectives of this study were to investigate the effects of the following capacities on the performance of road construction projects financial capacity, technical capacity, organizational capacity and regulatory compliance capacity. The stakeholders who are likely to benefit from the findings of this study are the government, along with private and public contractors specializing in road projects. The study was guided by the theory of critical chain project management and stakeholders’ theory along with the theory of constraints. The target population to the study were 83 consultants and engineers supervising the construction of road projects under Kenya Urban Roads Authority in Nairobi City County out of which 72 respondents successfully participated fully in the study. A census of the respondents was done because of their relative small size. Collection of data was done using questionnaires. Descriptive statistics was employed in data analysis to include the mean and the standard deviation. In addition, the regression analysis model was also used in data analysis. The regression model revealed financial, technical, organizational, and regulatory compliance capacities to affect performance of road construction projects. It is recommended that the contractors should consider expanding their investments so as to attract lenders. Apart from that, the employees under various contracting firms should be provided with opportunities for further training as a way of boosting their technical skills. In addition, the management of the various contracting firms should benchmark with the best contractors in the field as this may lead to an improvement in their organizational capacity. Last but not least, there should be increased awareness of the rules and regulations by relevant authorities among the employees as this will improve the regulatory compliance capacity.
CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Construction projects have proven to be important to societies and economies across the globe as has been acclaimed by many. The need and imperative for construction projects for any society cannot be denied. Indeed it has been asserted that construction industry is one a major facet that influences national prosperity (Ejaz, Hussain, Shabbir, Shamim, Naeem, Tahir, Ahmad, and Frooq, 2013). To support this, the World Bank (2011) observed that the failure to have an infrastructure that enhances green and inclusive expansion will make a nation to not only be in a difficult situation to meet fundamental needs, but also struggle to get competitive.

The scale of importance of roads projects especially in developing world is captured by the magnitude of financial investments governments are expending to road construction and the numbers they are employing. World Bank (2011) reported that roads expenditure in Sub-Saharan Africa is relatively high, averaging 1.8 percent of country's GDP. In Nigeria, the construction industry account for about 16.0 percent of (GDP) and employ about 25.0 percent of labor force in Nigeria, (Ayangade, Wahab, and Alake, 2009). The same is true in Kenya. Kenya has invested heavily in infrastructure according to the Road Sector Investment Plan 2010-2024. The construction industry in the Kenyan chapter contributes approximately 7 percent of the gross domestic product (CBS, 2013).

Despite the importance of road projects, construction of roads is beset by several challenges. This is in part due to the fact that the industry is multifaceted in its nature as it is executed by multiple parties such as clients, regulators, contractors, stakeholders, along with consultants, just to mention a few (Dadzie, Abdul-Aziz, and Kwame, 2012). The resultant statistics are grim across the divide. For example, only about 43 percent of construction firms that began operations in 2008, survived after four years of operations in the US (Ganaway, 2014). Research shows that 10 percent – 30 percent of projects are delayed in Saudi Arabia (Assaf & Al-Hejji, 2011) and at least 70 percent of projects in Nigeria experienced delays during execution (Odeyinka & Ysuf, 2007).

Many factors have been cited for high rates of project failure. In the case of USA, project failure is mainly caused by poor design, poor estimation of costs, site related issues,
technological issues and use of improper tools and techniques (Mok, Shen, & Yang, 2015). This failure has been more manifest in road construction projects across the globe with some devastating consequences which include; congestion in 42 percent of American roads and a loss of $101 billion wasted in time and fuel annually (Thomas, 2013).

The situation is so dire in the African countries that there are immense time overruns and cost overruns, missed benefits, along with termination of projects before completion. UNCTAD (2011) concurs pointing out that Africa has suffered immensely due to project delays, poor project timing, inappropriate budgeting and quality concerns in projects.

The government of Kenya has been spending massively on road construction projects in line with the Vision 2030 aspiration of a mix of transport and telecommunication infrastructure to spur growth (African Development Bank, 2009). This should be a boom for the local construction industry save for their lack of competitiveness in the face of a strong assault by foreign contractors eyeing the same contracts. This has brought the forces of globalization to bear on local contractors who must be competitive to remain afloat. Many factors have conspired to make competitiveness a requirement in the construction industry. Increase in globalization has made competitiveness a key factor in the present competitive world. Sanjay (2009) found that competition by international contractors in the road construction sector is not only very important in realizing growth for both domestic and foreign construction contractors but can no longer be avoided. It is because of this reason that this study delved into the performance of road projects in Kenya and the role of local contractors’ capacity over the same.

1.1.1 Performance of Road Construction Projects

There are many definitions of a project. One of the most universally acceptable definition of a project is an impermanent undertaking combining people and resources to come up with a unique offering within specified time and budget. (Project Management Institute, 2010). There are other indicators of performance among projects including quality of outputs and inputs, meeting set goals, standards and other technical specifications. On the context of performance as far as road construction projects are concerned, quality and client satisfaction ride high above the time and cost concerns which are well regulated in most jurisdictions. This school of thought argue that the controlling of operations is an indicator of performance
in the road sector (Shehu, Holt, Endut, & Akintoye (2015). Kerzner, & Kerzner (2017) posited that the performance of a project is simply an improvement on cost, timing and overall quality.

There are even more detailed and refined measures of project performance mostly emanating from empirical researches and practitioners views. Aminah (2009) categorized performance indicators into functional perspective, operational perspective, and professional perspective. A study carried out in India identified drivers for success as response planning and utilization prior feasibility analysis to ensure soundness of investments; ensuring compliances to regulatory agencies requirements; and identification and prioritization of risks in planning and monitoring, resource utilization and skilled project management talent. However, none of these construct negate the fact that an improved performance of contractor lead to better client satisfaction, reputation, and competitiveness (Xiao & David, 2013).

1.1.2 Contractor Capacity

According to Thomas & Ellis, (2007), contractor capacity involves understanding and analyzing any risk and developing strategies to mitigate thus raising the capability to handle them. To sustain economic expansion as well as growth for contractor capacity is critical and this is due to the fact that human capital is a precious asset of any contractor (Mok, Shen, & Yang, 2015). This study assessed the capacity of local contractors who were actively engaged in road projects with respect to the financial, technical, organizational and contractor regulatory capacities as outlined below. Capacity of contractor has been characterized as of invaluable value in the performance of road projects mostly because of the failures witnessed in the industry, massive public interest vested in the industry and the multi-million contracts in the sector (Thomas & Ellis, 2007). Most of the literature assessing the capacity of contractor has been based on financial capacity. In the case of local contractors, it has been lack of capacity to access credit due to lack of collateral and acquire loans (Badu, Edwards, & Owusu-Manu, 2012). The contractors have also been curtailed by macro-economic variables of high in areas they operate and high taxes making them less competitive. Tawil, Khoiry, Arshad, Hamzah, Jasri, & Badaruzzaman (2013) in assessment of financial capacity of road projects observed that most small and medium size contractor lack requisite financial resources to operate in an environment of erratic government payment regime.
Technical capacity is another arena that contractors are appraised and compete on. Crawford (2014) reported that technical capacity of contractors is mostly based on the quality of designing of roads and the number of rework they undertake on completed projects as this shows mastery of needed expertise in road construction. Bratton and Gold (2012) extended technical capacity of road projects contractor to innovative and creative use of their human capacity to match the tasks at hand. Fukuda (2018) observed that quality of workmanship and management competence were the hallmark of technical capacity of contractor.

Just like other firms operating in competitive environments, contractors are expected to have an organizational capacity to survive in the industry. Armstrong and Tylor (2014) supported this view by asserting that teamwork capacity by contractors especially those handling multiple projects accorded them an edge over similar firms. Badu et al., (2012) provided that the organizational capacity of contractors was manifested in avoiding overloads and always having workable delivery schedules. Chandra (2010) argued that organizational acumen among contractors was defined by seamless departmental co-ordination and communication. UNDP (2009) added to the mix of organizational capacity by providing that capacity for monitoring and evaluation was critical in road projects sector.

Capacity to comply with the operative rules and regulation in the jurisdiction of contractors’ work is an emerging arena of assessing contractor capacity because lack of fit with the operating environment has doomed the success of many contractors. This was observed by Nmadu (2012) who found that governance and regulatory compliance was critical in the capital intensive road projects industry and a source of great operational risks. Nmadu (2012) also observed that contractors have to exceed the standards set by oversight bodies including procurement and regulatory bodies not only to avoid non-compliance but also succeed in the performance and economic prosperity. Waiganjo (2015) reported that compliance in the standards set for partnership and sub-contracting was critical. This study investigated how these contractor capacities affect the performance of local contractor undertaking road projects within the county of Nairobi.

1.1.3 Road Projects in Nairobi City County

The county of Nairobi has many completed and on-going road projects being undertaken by both local and international contractors with varying degree of sizes. The greatest road project in Nairobi County; the Thika Superhighway, reveal the challenges in road projects in
Nairobi and the associated lack of capacity by local contractors as it was built by the celebrated Chinese contractors. For Thika Superhighway, the cost shot from 26.44 billion up to 34.45 billion, and this is according to World Bank (2014). The completion date itself had to be revised from the earlier one of July 2011, to July 2013.

The small scale and medium size contractors make over 90 percent of the contractors in the market. These firms are classified according to financial muscle as determined by capitalization. These contractors contribute substantially to the economic growth and GDP. They also account to about 50 percent of procurement of building materials and nearly 805 of the casual laborers needed at the construction sites (World Bank, 2014).

Road construction and contractors in Nairobi face a raft of challenges and capacity constraints as evidenced by the following findings and writings. Hassan and Guyo (2017) asserted that project cost, procurement procedures, adherence to design specification and contractors experience were the major factors influencing the completion of government funded road projects within Nairobi. They argued that these factors conspired and the effects were that contractors were not able to adhere to material, labor, equipment and cost control required of competent contractors. Badu et. al (2012) observed that contract administration, finances, design variation and technology significantly influenced completion delays of large road projects in Nairobi.

Staff competency along with the management systems put in place by the contractors have been identified as the soft underbelly of contractors undertaking road projects in Nairobi. Osedo (2017) was of the view that staff competency has an effect on the effective implementation of county construction projects within Nairobi. In addition, he also added that management support influences the effective implementation of county construction projects. Njenga (2014) was of the view that lack of benchmarking by contractors, inappropriate project management techniques, inappropriate procurement and communication as inhibiting contractors’ ability to efficiently complete road projects in Nairobi.

Wairimu (2016) observed that resource availability influenced the completion of road projects and one of the resources that is mostly not enough is financial resource. Competency of staff also influences completion of the road projects. In this regard, it is noted that if the staff has the required skills, experience and knowledge in the area this would help them undertake the task placed on them. Additionally, stakeholder participation also influences
completion of road projects and that stakeholders should be encouraged to participate in projects.

Despite these debilitating set backs on the local contractors in Nairobi, they have been undertaking numerous road projects in the City County of Nairobi. From the records, the total road network is 2,968 km out of which some 1,331.1 km have been paved with bituminous surface. 504.1km are of gravel standards and 1,133.6 km have earth surface (County Government of Nairobi, 2017). Most of these constructions are being undertaken by local contractors with varying degrees of success, thus making an assessment of their capacity critical.

1.2 Statement of the Problem

Project performance is considered along the established iron triangle of cost, time and quality though safety has become as important (Adegbembo, Bamisaye, & Aghimien, 2016). Meeting other technical specifications set in the contracts have also been used as indicators of performance of road projects. Road projects performance in Nairobi County is beset with many challenges with debilitating effects on the contracting parties. The challenges range from poor use of road project funds, completion delays along with poor service delivery to the road users, and over-reliance on foreign contractors where technical capacity and massive projects are to be undertaken. Further, the road project performance systems set by the contractors are wanting and unethical practices commonplace. These challenges plus their linkages to the capacity of the engaged contractors have been made by many credible reports and empirical studies (ROK, 2009; and Ministry of Roads and Public Works, 2013).

The greatest pointer that lack of capacity by contractors has led to this grim situation in road construction in Nairobi was made by Githenya and Ngugi (2014) who provided evidence that despite investing in training in the Kenyan construction industry, the construction projects still do not meet key performance criteria. Studies carried out on road projects were done outside Nairobi County. Their scope has been on factors within the control of the contractors and some without. On the contractors capacity they have mostly investigated the resources at the disposal of the contractors, competency of staff, building technology and methods and management techniques used by the local contractors (Badu et. al, 2012; Njenga, 2014; Wairimu, 2016). The studies failed in comprehensively assessing the capacity of the local
contractors and authoritatively explain the evident gaps in their performance in road projects; which this study fulfils.

1.3 Objectives of the study

The general objective of this study was to scrutinize the influences of contractors’ capacity on the performance of road projects in Nairobi County, Kenya.

1.3.1 Specific Objectives

The following were the specific objectives:

i. To find out the effect of contractors’ financial capacity on performance of road projects in Nairobi County, Kenya.
ii. To determine the effect of contractors’ technical capacity on performance of road projects in Nairobi County, Kenya.
iii. To establish the effect of contractors’ organizational capacity on performance of road projects in Nairobi County, Kenya.
iv. To assess the role of contractors’ regulatory compliance capacity on performance of road projects in Nairobi County, Kenya.

1.4 Research Questions

The study had the following questions:

i. How does contractors’ financial capacity affect the performance of road projects in Nairobi County, Kenya?
ii. What is the effect of contractors’ technical capacity on the performance of road projects in Nairobi County, Kenya?
iii. How does contractors’ organizational capacity affect the performance of road projects in Nairobi County, Kenya?
iv. What is the effect of contractors’ capacity to comply with regulatory requirement on performance of road projects in Nairobi County, Kenya?
1.5 Significance of the study

The finding of this study may be useful to multiple players found in the construction oriented industry and this include the regulators, contractors, road users and even lenders to investors in the construction industry. The finding would be helpful for decision making by policy makers in the ministry of roads and public works and enhance the awareness of contractors’ implementation strategies for successful conveyance of road projects. The findings to this study may also benefit the road contractors in Kenya. By using analyzed results, contractors in small firms will clearly understand the causes of declining performance of the sector and be conversant with the best solutions in regards to performance in their pursuit for increased returns and sustainability.

The findings of the study may benefit road construction authorities in their regulation of contractors by gleaning their capacity from the findings of the research and acting on the recommendations given. Further, the finding of this study may benefit the government through ensuring that government tenders are only issued to contractors with the requisite capacity as delineated and identified by this research. Last but not least, the findings along with the recommendations of this study will be utilized by the researchers to inquire more on the road projects in Kenya, as well as the academicians to understand more on factors influencing implementation of road projects in Kenya.

1.6 Scope of the study

The study was done in Nairobi County. As such, only the contractors and regulatory authority working within the county of Nairobi were considered for the study. The target respondents were the officials in the government bodies that construct various types of roads in the County of Nairobi. The scope of the investigation of the capacity of the contractors was limited to the study variables of financial capacity, technical capacity, organizational capacity and capacity to comply with the law.

1.7 Limitation of the study

The study encountered some challenges. The contractors who were targeted were in the field working in far flung areas of the County of Nairobi and covering expansive areas. To surmount this challenge, research assistants were used. Some respondents were also hesitant in providing critical information with fear of reprisal. To curb this challenge, verbal
persuasion along with the production of the introductory letter from the university helped in convincing the respondents to accord sensitive information. Last but not least, some respondents were very busy to the extent that they could not be able to fill the questionnaire in a single sitting. To handle this problem, drop and pick method of data collection was used.

1.8 Organization of the study

The study entails five chapters and appendices. Each of the chapter covers a distinct area of the study. Chapter one introduces the concepts to be studies, the gaps and contextual challenges in the problem statement, study objectives, study limitations, significance of the study, limitations and scope. Chapter two contains literature review that includes both the theoretical and empirical review on the study variables. Chapter three contains the research plan detailing the study design, target respondents, sampling procedures, data collection and analysis techniques along with presentation. Chapter four presents data along with the study findings and their interpretation. Chapter five outlines summary of findings, conclusion and recommendations along with suggestion for further studies. The appendices comprises of the data collection instrument, references, introductory letter, authorization letter from NACOSTI, and research permit.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter comprises of a theoretical review, along with an empirical literature review organized according to study variables, a conceptual framework on graphic relationship of variables with indicators of measurability and the gaps in knowledge the study fills.

2.2 Theoretical Review of Literature

The following project management theories guided the study:

2.2.1 Critical Chain Project Management Theory

This theory was developed by Youngman (2009) that details a critical chain with constraints that should guide operations of a project. The aim of the chain is to ensure constraints are surmounted in order to protect the date of project completion. This was done by careful considerations of resources, variations, task structure and uncertainty. When put into practice, the posits of the theory produce robust and dependable approach that should cut project time by 75 percent. This enables contractor to deliver quality project and on time. It enables contractor to deliver on more than one project on time, without incurring extra cost thus boosting the bottom line.

This theory will guide the study in establishing the financial capacity of the contractors involved in road projects within Nairobi County and how that has an effect on performance of road projects that fall under them. The salient provisions of the theory on task scheduling in relation to available of resources, assessing the resource dependency of a firm and dealing with variations in costs was applied in the evaluation of financial capacity of contractors. For example, the study sought to find how delay in disbursement of money by the government affects the operations of the contractors in line with posits of this theory. The major criticism of the theory is that it emphasizes reduction of completion time in case where there are numerous projects being undertaken by some contractor.
2.2.2 Stakeholder Theory

This theory was first expounded by Freeman (1984) prescribing models of identifying stakeholders of a corporation and how to productively engage them. In the road construction sector, the theory is invaluable in identifying stakeholders to enable planning, managing and implementation of projects. Subsequent scholars have attributed stakeholders theory to a number of gains in project management including development of teamwork among teams by incorporating opinions of others (Godfrey, & Lewis, 2018). Harmonization of dissimilar views as was observed by Freeman, Phillips, & Sisodia, (2018) incorporating the now mandatory corporate social responsibility in projects (Andriof, Waddock, Husted, & Rahman, 2017).

In the construction business, the theory helps organize the multifaceted assortment of tasks in planning along with scheduling and consolidate the views and hopes of all stakeholders which is a critical role of project managers to enable success of projects (Nguyen, Mohamed, & Panuwatwanich, 2018). This is because some stakeholders can impede some resources and undermine the performance of projects. The key to success is getting the ability to recognize and manage stakeholders in a project.

In respect to this study, the theory will guide the study in its provisions of organizing, managing and meeting the needs of various stakeholders in the road construction projects especially the government for provision of financial resources, licensing and regulations and the wider society for provision of skilled labor to enable the contractors gain technical capacity. More specifically, the theory guided in the variable of this study on regulatory compliance capacity. In this regard, the capacity of the contractors to meet the requirements of such authorities such as Kenya Roads Authority (KRA), National Environmental Management Authority (NEMA) and National Construction Authority (NCA) were investigated to find out if they have the capacity in this front. The theory is criticized since it deals with external stakeholders who can impede the performance of project and ignore internal stakeholders like project managers and skilled manpower who are cornerstone of every contractor capacity like technical capacity.
2.2.3 Theory of Constraints

This theory was developed by Eliyahu (2009) to help organizations identify what to change, how to trigger change and the needed environment for success. The theory makes a case that human beings are rational, can think, are good and systems are simple provided constraints are eliminated. This theory is particularly invaluable to projects which have set out tasks to be completed in a certain order and can be successful if the constraints are identified and eliminated. According to Goldratt (2009) the constraints can be how systems perform or something acting upon project management system.

In project management the constraint may be in cost management, conflict, poor managerial practices along with lack of the required interventions Eliyahu (2009) identified budget constraints as a constraint to managers who must get success within prescribed budgets and suggested that they should focus on fixing the main problems and overall performance improves. Other causes of constraints include failure to examine an organization as a whole when developing cost estimates due to considerations of short term goals (Rothwell, Hohne, & King, 2018). It is for this cause effect relationship on budgets, constraints and performance of projects that this theory guided this study. It guided the study in establishing the technical capacity of contractors in road projects industry in Nairobi County. The provision of the theory guided in establishing if the contractors have the requisite technical capacity in both managing the work schedule and financing of contracting firms. The theory of constraint is criticized for not factoring in capacity and efficiency as key constraints in project as this study will be. The theory is pre occupied with budgeting, cost management conflict and other managerial conflicts. Capacity and efficiency were added as constraints.

2.3 Empirical Review of Literature

The empirical review of related and relevant studies done as organized in respect to the variables of the study are as follows:
2.3.1 Contractor Financial Capacity and Performance of road projects

Olusanya (2018) in his studies in the Nigerian construction industry confirmed that indigenous construction companies have challenges of under-capitalization. Erdogan, Saparauskas, & Turskis (2017) in their studies in London found that constrained working capital was the main challenge in the daily operations of contractors. In china, Chen (2007) suggested that contractors should plan and allocate funds for the entire projects to avoid stoppages on account of lack of funds. The research further suggests that, with well-developed institutions both legal and financial, firms will have equal chances to access finance and have better prospects of growth. Scarpetta, Fally, & Aghion(2007) present arguments to emphasize ability to access finance by small firms as being important to give them equal footing to compete with large firms. Scarpetta et al. (2007) suggested that provision should be made for cheaper credit to contractors who have established themselves in the industry.

In Nigeria construction, Nwude (2010) observed that it requires a determined positive effort by the contractor as mismanagement can weaken productivity and profit level. Managing working capital has been found to be very critical. For the level of working capital to be maintained and for there to be sufficient provision of funds to finance current assets to facilitate projects to be project completion within cost and time, there is need for establishing the optimum level of working capital needs of a project. In addition, Jackson (2010) on determinants of project performance in China he asserted that the availability of project finances is a critical aspect that has an effect on the delivery of a project especially for small contractors who lack fixed assets, are not diversified and lack capacity to sub-contract like their counterparts in the developed world. Cash flow challenges also hamper work in progress and can lead to time overruns (Rahman, 2013; Ameh & Osegbo, 2011) in construction related projects that are large in size in Malaysia. This is not the case in Kenya where many contractors are not well established in the Kenyan road construction sector.

A study by Badu et al. (2012) in Ghana found out that both small and large contractors find it hard to access funds because of lack of collateral and the structure of their assets that do not impress lenders. The study found that the payment system of the governments disadvantage
small contractors who lack reserves and depend entirely on erratic government payment system. Pending bills for executed tasks is extensive and is the chief reason of incomplete projects (Adams, 2012).

Ramachandra (2013) on construction industry in New Zealand, suggests that failure to pay in the construction industry may be put in three categories; delay in paying one or more certificates, reduction in value of certificates or invoices, and not paying at all. The performance of the participants involved and the product output is dependent on the promptness and regularity of payment (Ramachandra, 2013). Tawil et al., (2013) observed that in Malaysia delay is a common occurrence particularly where the government projects are concerned. In Malaysia, fluctuations in the cost of materials and cash flow challenges affected contractors (Rahman, 2013).

Kenyatta, Ahmad, & Mbiti (2015) found that late payment, underpayment, paying intermittently and non-payments are factors that cause cash flow crunch among contractors in Kenya. This also escalates to disputes that delay road projects and even bankruptcy. Maiyo and Imo (2015) argued that most firms depend on credit finance from banks and this access to credit, particularly for starting the projects is problematic and difficult to acquire because of collateral requirement and problematic state of contractors’ assets. In the Kenyan case, Asinza, Kanda, Mchelule and Mbithi (2016) found that budgetary allocations by contractors affected quality of projects.

Kulemeka, Kukulanga and Morton (2015) found that financial factor were impeding contractors in Malawi. These were factors were identified as high lending rate regimes by financial entities, limited access to capital, high taxes and strict rules of accessing funding from bonds. These factors were prevalent among all contractors in Sub-Saharan Africa.

In Kenya, Mwangi (2016) conducted a study on factors influencing the contractors’ performance in road construction projects and realized that working capital and organization structure have the highest influence followed by skilled manpower and client support in that order of significance. The study emphasized that working capital is critical in ensuring smooth construction operations. This was corroborated by Su (2016) who found that for small contractors, managing scarce resources was a curtailing challenge.

In addition, Mwangi (2016) found that lack of working capital was hampering local road construction firms. Moreover, it was also identified that delays in progress payment by client
and financial difficulties by contractors was among the most highlighted causes of construction projects delay.

2.3.2 Contractor Technical Capacity and Performance of road projects

The expertise and experience of the manager is another frontier of establishing technical capability of construction firms. Fukuda (2018) found that inadequacy in technical management of staff led to poor workmanship accounted for poor roads in Nigeria, inefficiency of contractors, accidents on roads and lack of organizational stability.

Worsely (2009) concurred with these findings and found those contractors who were recruiting managers without managerial skills and experience faced challenges in project implementation in Kenya. Al-Momani (2010) in Jordan, found the decision making capability of the management team as affecting projects. Jackson (2010) in China found that the mindset of a project manager has an effect on project success. The manager should have an open positive mind, adaptable, prudent risk taker, fair and committed to the tasks at hand.

Medugu, Rafee Majid, Bustani, Bala, Abdullahi, & Mbamali, (2011) in the Nigerian construction industry observed that where highly capable workforce is utilized, the effect of skilled manpower in the construction sector is very visible in its end products. This is due to the fact that skilled manpower is actively engaged in the early realization of construction projects completion since they handle the technical phase of such contract.

The extent of influence of technical capacity on performance of contractor was reported widely that over 50 percent of World Bank projects were not successful in the year 2010 due to technical incompetence of contractors especially on managerial and technical areas by Chauvet, Collier, and Duponchel, 2010 in their studies in Washington. Crawford (2014) summarized these technical failures to include designing, stakeholder engagement, coordination and cost management.

Most of the technical problems facing projects have a direct link with the skills of the manpower than any other infrastructure. Bratton & Gold (2012) reported that the challenge was matching people to skills gaps by contractors. Kaya & Patton (2011) in Turkey found that management of knowledge and innovations affected contractors in Turkey. Rafee (2012) reported that lack of skilled manpower affected contractors in Nigeria.
2.3.3 Contractor Organizational Capacity and Performance of road projects

Organizational capacity in a firm can be defined as the situation when people work efficiently towards a pre-defined goal (Armstrong & Taylor, 2014) in London. This requires getting right a number of factors that require skill and capacity. Wolf (2013) observed that efficient organization structure has a positive effect in the firm’s implementation culture, it guides the firm’s productivity, including performance process. Clemmer (2013) in Kenya reported that organizational structure should be in place to regulate the undertaking of tasks and have provisions for planning, directing, organizing and controlling tasks. Javed, Zhan, & Pan (2018) found that co-ordination of all the departments was critical.

In India, Larsen, Shen, Lindhard, & Brunoe (2015) reported that coordination and control were the hallmarks of organized contractors. Steyn (2007) found that work plans and work schedules should be well organized to avoid overloading staff that affect performance in Malawi. Monitoring and evaluation are key practices in assuring project success. According to UNDP (2009) monitoring aids in establishing what works in operations, thus creating efficiency and enhancing effective use of resources.

The traditional form of organization is not suitable for project work as it lack means of integrating different departments and facilitating effective communication (Chandra, 2010) in New Delhi. As such other forms of project organization are where an individual or group of individuals are entrusted with the responsibilities of organizing the projects. Three forms of project organization arise depending on how the authority of the project manager is exercised namely: Functional organization, Divisional organization, and Matrix organization. The right environment should be created by the management teams to enable the staff perform to their capacity an act that call for dexterity and organizational skills by the managers (Bredin & Söderlund, 2011). In addition, Bredin and Soderlund (2011) found that most of the factors that affect performance are people based, team selection, team experience and team commitment. Winfred (2011) reports that an appropriate managerial structure could support teams in management in attaining enhanced performance in the project by increasing in productivity.

In Kenya, Mbiti (2015) found out that there is need to use participatory approaches during monitoring and evaluation of projects. The organization needs to have a computerized database for storage and analysis of soft wares and data collection tools; have progress and results review platforms and reporting templates. On construction of roads, Maaty, Akal and
El-Hamrawy (2016) investigated the factors that affect performance of Highway road projects in Egypt and found that organization was a key factor. The key outcomes of organizational efforts that led to success in road projects was found to include; experience, efficiency in inspection teams and clarity of responsibility.

2.3.4 Contractor Regulatory Compliance Capacity and Performance of road projects

The imperative for adherence to laws and regulatory environment in regard to governance and other public interest measures was emphasized by Stern and Cubin (2008) who found that compliance to governance and regulatory laws leads to success of organizations and project. They found that governance and regulation is positively associated with high generation capacity and higher utilization rates across all industries.

Gelderman, Semeijn, & Vluggen (2017) reported that detailed provisions on compliance should be made to players in environments of weak regulations like Kenya. It was noted that the only sector with growing enforcement is procurement to the exclusion of others facing contractors (Mukulu, 2005; Puddephatt & March, 2002) in Malindi, Kenya. According to Mitchell and Ambrose (2007) regulatory environment enhances quality, efficiency, protects the individual, control costs, and ensures access. The basic aim of regulations is the establishment of standards of practice which define expectations on which to measure quality. Famakin and Fawehinmi (2012) reported that safety was a concern that needed to be regulated in the construction industry in Nigeria.

Most of the studies on compliance invariably deal with procurement, governance and oversight bodies. Nmadu (2012) in Nigerian construction, revealed that compliance to procurement laws and associated know-how can lead to sustainable development. Human resources emphasis should be above goal emphasis which according to this research showed that only one out of seven showed compliance. Effect on compliance to government procedures has been attributed to performance of projects. This is more so in compliance with statutory procedures and governance mechanisms. Umeokafor, Umeadi and Jones (2014) found that key issues to compliance with regulations included client influence, adequate regulations and adequate enforcement in Nigeria. Mathenge (2012) reported that ethics was a stumbling block on enforcing standards in the Rwandan construction industry.

Minjire and Waiganjo (2015) found that governance was a key element in ensuring compliance with the law in complex projects but found that in Kenyan case weak regulations
and bureaucracy, rigid rules and ambiguity in rules undermined compliance. A strong legal framework facilitates transparency when it comes to the procurement process.

Jeptepkeny (2015) found that there should be pre-determined and communicated specifications for the bidders and contractors to comply with regulations. Gacheru and Diang’a (2015) found that there were challenges in enforcement of regulations among contractors in Kenya noting that NCA was faced with challenges of corruption, lack of sensitization and training and lack of reach by the NCA. Ndumia (2015) on constructions in Nairobi found that the regulatory environment should be involve stakeholder involvement, should be interactive; propose effective mitigation measures and the various regulators should have the requisite legal capacity to prosecute errant players.

2.4 Summary of Literature Review and Research Gaps

There is an apparent shortage of studies on actual contractor capacity in the road construction segment though we have a growing body of literature on contractor roles. From the empirical literature done, most of the studies on contractor capacity emphasized on financial capacity. For instance, Olusanya (2018) in his studies in the Nigerian construction industry confirmed that indigenous construction companies have challenges of under-capitalization. Chen (2007) suggested that contractors should plan and allocate funds for the entire projects to avoid stoppages on account of lack of funds. Scarpetta et al. (2007) suggested that provision should be made for cheaper credit to contractors who have established themselves in the industry. Nwude (2010) observed that it requires a determined positive effort by the contractor as mismanagement can weaken productivity and profit level.

In addition, it was observed that other studies on contractor capacity were carried outside Kenya and emphasized on technical capacity. For instance, Fukuda (2018) found that inadequacy in technical management of staff led to poor workmanship accounted for poor roads in Nigeria, inefficiency of contractors, accidents on roads and lack of organizational stability. Kaklauskas, Amaratunga & Lill (2010) found that failure of managers to create relationship with staff. Al-Momani (2010) found the decision making capability of the management team as affecting projects. Kaya & Patton (2011) found that management of knowledge and innovations affected contractors in Turkey. Rafee (2012) reported that lack of skilled manpower affected contractors.
Further, from the empirical review it was noted that several studies on contractor capacity dwelled on organizational capacity of contractors. For instance, Wolf (2013) observed that efficient organization structure has a positive effect in the firm’s implementation culture, it guides the firm’s productivity, including performance process. Clemmer (2003) reported that organizational structure should be in place to regulate the undertaking of tasks and have provisions for planning, directing, organizing and controlling tasks. Javed, Zhan, & Pan (2018) found that co-ordination of all the departments was critical. Bredin and Soderlund (2011) found that most of the factors are people based, team selection, team experience and team commitment. Winfred (2011) reports that an appropriate managerial structure could support teams in management in attaining enhanced performance in the project by increasing in productivity.

Moreover, from the empirical review studies on contractor capacity involved regulatory compliance among contractors. For instance, Gelderman, Semeijn, & Vluggen, (2017) reported that detailed provisions on compliance should be made to players in environments of weak regulations like Kenya. It was noted that the only sector with growing enforcement is procurement to the exclusion of others facing contractors (Mukulu, 2013; Puddephatt & March, 2012). Umeokafor, Umeadi and Jones (2014) found that key issues to compliance with regulations included client influence, adequate regulations and adequate enforcement.

Table 2.1 presents the gaps exposed by the reviewed literature in Kenya.
<table>
<thead>
<tr>
<th>Author and Year</th>
<th>Title</th>
<th>Findings</th>
<th>Research Gaps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hassan and Guyo (2017)</td>
<td>Determinant of completion of government funded projects in Nairobi City County</td>
<td>The study indicated that project cost, procurement procedures, design specifications and contractor experience affect completion of road projects</td>
<td>Apart from experience the study did not assess other aspects of contractor capacity. This study sought to fill in the gaps by assessing the technical, financial and organizational capacities</td>
</tr>
<tr>
<td>Seboru (2015)</td>
<td>An investigation into factors causing delays in road construction projects in Kenya</td>
<td>The study found that contractors administrative procedures, finances, design and technology affect construction of projects</td>
<td>The study failed to consider the organizational capacity and compliance to the law by contractors. It only assessed factors from the environment to the exclusion of contractor specific factors. This study aimed at filling the gap by going away from procedures to actual capacities of the contractors as guided by variables</td>
</tr>
<tr>
<td>Kagiri and Wainaina (2008)</td>
<td>Road construction projects in Kenya</td>
<td>The study outlined that planning, quality management, risk management, communication</td>
<td>The study only confided itself to management capacity to the exclusion of the</td>
</tr>
<tr>
<td>Study</td>
<td>Title</td>
<td>Findings</td>
<td>Additional Information</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Osedo (2017)</td>
<td>Determinant of effective implementation of Construction projects in Nairobi County</td>
<td>The study made an observation that staff competency, management support, project planning tools and techniques significantly affects implementation of projects.</td>
<td>The study assessed, to minimal scope the planning and staffing capacity of contractors. This study widens the scope of the two and also assess the organizational and compliance capacity of the contractors.</td>
</tr>
<tr>
<td>Li Nianjum, (2014)</td>
<td>Social economic factors affecting implementation of road construction projects in Nyeri County, Kenya</td>
<td>The study found that training, financial status and government support affect contractors in road construction industry.</td>
<td>The study paid attention to the environment and not the actual contractors. This study investigated contractors capacity and compare with Nairobi County and cure the exoneration of contractor organizational and compliance capacity in the study.</td>
</tr>
<tr>
<td>Wairimu (2016)</td>
<td>Factor influencing completion of road projects in Embakasi, Nairobi</td>
<td>The study found that availability of resources, competency of staff, contractor experience and knowledge affected completion of roads significantly.</td>
<td>The study assessed the capacity of the contractors in a nimble manner with few indicators of competence of contractors in various capacities. The study used likert scale items.</td>
</tr>
<tr>
<td>Njenga (2014)</td>
<td>Factors influencing effective and efficient delivery of road projects in Nairobi County, Kenya</td>
<td>Benchmarking, project management practices, procurement and communication affected the efficiency and effectiveness of contractors in road construction projects</td>
<td>The study assessed factors beyond the control of the contractor and as such the contractor capacity was not effectively investigated but the effectiveness of systems was given prominence. Again the role of contractor capacity was missing in the study a gap this study sought to fill</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mwangi (2016)</td>
<td>Factors influencing the performance of contractors in road construction projects in Kenya</td>
<td>The study found that working capital, manpower, organizational structure and client support affects contractors in road construction projects</td>
<td>This study made an attempt to assess capacity of contractors but was limited to financial and staffing capacity. This study build on these findings but widen the scope to include organizational, technical and compliance capacities to get the totality of contractor capacity and how it affects road construction projects</td>
</tr>
</tbody>
</table>
### 2.5 Conceptual Framework

The figure below outlines the link between the proposed research variables complete with the indicators that were used to measure the variables. The arrows show the direction of influence.

#### Independent variables

<table>
<thead>
<tr>
<th>Financial Capacity</th>
<th>Performance of Road Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lending capacity</td>
<td>Cost</td>
</tr>
<tr>
<td>Financial position</td>
<td>Quality</td>
</tr>
<tr>
<td>Receivables</td>
<td>Time</td>
</tr>
<tr>
<td>Payables</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical Capacity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of new techniques</td>
<td></td>
</tr>
<tr>
<td>Managerial competence</td>
<td></td>
</tr>
<tr>
<td>Safety measures</td>
<td></td>
</tr>
<tr>
<td>Managing change</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organizational Capacity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring levels</td>
<td></td>
</tr>
<tr>
<td>Planning and controlling</td>
<td></td>
</tr>
<tr>
<td>Coordinating</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulatory Compliance Capacity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance to regulatory authorities</td>
<td></td>
</tr>
<tr>
<td>Legal suits</td>
<td></td>
</tr>
<tr>
<td>Adherence to industry standards</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: 1.1 Conceptual Framework

Source: Author (2017)
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the study methodology. It outlines the study design, target population, methods of data collection along with data analysis, sampling procedure, along with the ascertainment of both validity and reliability. All these helped in attaining the study objectives.

3.2 Research Design

Descriptive study design was utilized in this study. According to Kothari (2007) the design provides answers to predetermined research questions. Using the research design, this study aimed at collecting quantitative data from a cross-section of people involved in the road construction sector in Nairobi.

3.3 Target Population

The target respondents were 83 professionals who participate in supervising contractors involved in road projects under the management of Kenya Urban Roads Authority (KURA) in Nairobi City County as tabulated in table 3.1. These include contractor consultants, engineers from KURA, engineers from the national government ministry of road and technical auditors.

Table 2: 3.1 Target Population

<table>
<thead>
<tr>
<th>Category of Population</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractors consultants</td>
<td>28</td>
</tr>
<tr>
<td>Engineers from KURA</td>
<td>40</td>
</tr>
<tr>
<td>Ministry of Roads Engineers</td>
<td>10</td>
</tr>
<tr>
<td>Technical Auditors</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>83</strong></td>
</tr>
</tbody>
</table>

Source: KURA, 2017; Ministry of Roads, 2017)
3.4 Sampling Procedures and Sample Size

The study employed census sampling technique because of relative small size of the target population. This ensured collection of some comprehensive data on the capacity of local contractors from the totality of their supervisors in order to inform policy and practice.

3.5 Data Collection Instruments

Collection of primary data was done with the aid of questionnaires since they are ideal for collecting data from fairly large group of people who are literate. The questionnaire had closed, open-ended and likert scale based questions and were structured as follows; Part A which sought to gather the respondents’ personal details; Part B which contained effects of financial capacity on performance of road projects; Part C which contained effects of contractor technical capacity on performance of road projects; Part D which contained effects of contractors organizational capacity on performance of road projects and lastly Part E which contained the effects of contractor compliance to regulations capacity on performance of road projects. This enabled ease of analysis as the information was in immediate usable form.

3.5.1 Pilot study

Taking into consideration the significance and need to identify and establish weaknesses in the instrument that were used in the study, the self-administered questionnaire were pre-tested before distributing it to the respondents. The questionnaires were reviewed by the supervisor along with other experts and were subsequently tested on a sample of ten (10) engineers from Machakos County. A total of 10 questionnaires was used in piloting. Machakos County was selected for the piloting of the research instruments because of the presence of similar roads being constructed, proximity to Nairobi and the well-publicized supervision of contractor by the county government of Machakos. The result has been a presence of well-constructed road projects in Machakos County in the recent past. From the pilot study, it was noted that some questions were being misinterpreted by respondents. Also in the pilot study, there were some inconsistency in the questionnaires which were noted. Thus, the questionnaires were further edited after piloting to ensure validity and reliability as indicated in table 3.2. The sample size for the sample met the 10 percent size to study population as was advocated by Mugenda and Mugenda (2003).
3.5.2 Validity of the Research Instruments

Validity refers to the extent to which a research instrument, such as questionnaire is the case for this study, measures what it is designed to, so as to enable drawing of valuable inferences (Ndambiri, Kiragu, & Riro, 2018). The study used content validity whereby the supervisor along with other experts examined the questionnaires and advised on ways of removing ambiguity and inconsistencies and ensure alignment with the study variables and in so doing there was uniformity of understanding and responses from the respondents.

3.5.3 Reliability of Research Instruments

Reliability implies the consistency of the study instruments meaning it should yield findings that are consistent when administered to an individual more than one time or by many respondents (Mugenda & Mugenda, 2003). The piloting enabled conducting of a test-retest and subsequently used Cronbach Alpha Co-efficient to determine reliability of the questionnaires. The threshold for acceptance of reliability of the questionnaires was set at 0.7 as was used by McNeish (2017) .Variables below this threshold were edited for correctness and ambiguities were removed as indicated in table 3.2.

Table 3: 3.2: Reliability Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Items</th>
<th>Cronbach Alpha (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial capacity</td>
<td>2</td>
<td>.746</td>
</tr>
<tr>
<td>Technical capacity</td>
<td>2</td>
<td>.735</td>
</tr>
<tr>
<td>Organizational capacity</td>
<td>2</td>
<td>.860</td>
</tr>
<tr>
<td>Regulatory capacity</td>
<td>1</td>
<td>.725</td>
</tr>
</tbody>
</table>

Financial capacity had alpha coefficient of 0.746, technical capacity had 0.735, organizational capacity had 0.860 and regulatory capacity had 0.725. This indicates strong internal consistency among measures of variable items as improved from the pilot study. Therefore, the data collection instrument was regarded to be reliable and acceptable for the study.
3.6 Data Collection Procedure

Data collection was preceded by seeking of authorization to collect data and visit the data collection sites from the University, NACOSTI, and the management of the sampled road construction firms. Research assistants were engaged to assist in data collection. To clearly understand the research instruments, the assistants were trained on the intention of the study and moral values of the study. The questionnaires to the respondents were administered face to face and drop and pick method of data collection subsequently applied.

3.7 Data Analysis Techniques

Data analysis refers to the process of bringing order, structure and interpretation to collected data. Data analysis entailed preparation of the collected data - coding, editing along with cleaning of data for processing by SPSS package. Data collected was presented into spreadsheets using MS Excel. The data was then entered into SPSS version 21. This software has various statistical tools that can be used to manipulate quantitative data for interpretation. The analysis was mainly done through mean scores and standard deviations. The following regression model was used in the analysis.

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \]

Where \( Y \) = performance of road projects

\( \beta_0 \) = Intercept

\( X_1 \) = Contractor Financial Capacity

\( X_2 \) = Contractor Technical Capacity

\( X_3 \) = Contractor Organizational Capacity

\( X_4 \) = Contractor Regulatory Capacity

\( \beta_1, \beta_2, \beta_3, \beta_4 \) = Coefficients

\( e \) = Error variable

The error term represents other elements that affect the dependent variable which do not form part of the study.
3.8 Ethical Considerations

Ethics was adhered to in the course of carrying out this study. For instance, there was voluntary participation of the respondents. There was also observation of confidentiality on the responses and the collected data. The respondents were informed about the study objectives with a promise that collected data shall only be utilized for purposes of this study. Borrowed materials were acknowledged and as such plagiarism was not practiced. The findings of the study were not doctored to suit any pre-conceived ends.
CHAPTER FOUR: RESULTS AND FINDINGS

4.1 Introduction

The chapter outlines the findings of the study on contractor capacity of local contractors and performance of road projects. Analysis and interpretation through descriptive and inferential statistics is also contained in the chapter.

4.1.1 Response Rate

The study sample was 83 respondents who were engineers, consultants, technical auditors and officials of the highway authorities. The local contractors were selected from active participants in road projects in Nairobi City County. A total of 83 respondents was the study target from which 72 filled in and returned the questionnaires with a rate of response of 86.7 percent. This rate was acceptable to make conclusions for the study as it was considered representative. According to Mugenda and Mugenda (2003), a rate of response of 50 percent is sufficient for analysis and reporting; a rate of 60 percent is good and a rate of response of 70 percent and over is exceptional. Based on this assertion, the response rate was outstanding.

4.2 Demographic Characteristics

The analysis of respondents, their characteristics was carried out in relation to age bracket, educational level, position in the organization, and period which the respondents has worked in road construction sector.

4.2.1 Respondents’ Distribution

The study aimed at establishing the distribution of the respondents by profession. This was important ascertain the level of technical skills the study had to get information from in the road construction industry which is largely technical in nature.
The results indicate that 7 (14.6 percent) were contractors, 7 (14.6 percent) were consultant, 13 (27.1 percent) were road surveyors, 9 (18.8 percent) were engineers and 12 (25 percent) were representing technical auditor. This broad sample was meant to eradicate any bias or information asymmetry that might afflict one category of professions, and also to ensure that a holistic and balanced views on the topic was established

### 4.2.2 Level of Education

Chart 4.2 presents the educational and professional qualifications of the respondents to the study.

![Level of education chart]

**Figure 2: 4.2 Level of Education**

**Source; Researcher (2018)**

From the research findings, the study noted that 56.9 percent held bachelor’s degree, 33.3 percent of the respondents indicated to hold master’s degree, 7.8 percent of the respondents indicated to hold diploma certificate, while only 2.0 percent held PHDs. Most of the professionals had Bachelors’ degrees which was mostly the case for engineers and building contractors. In general, all the respondents were qualified. Most activities in road
construction are highly technical and contractors must comply with set standards of using qualified professionals for quality work.

4.2.3 Industry Experience

The study sought to establish the level of experience of the respondents in the road construction industry. It was noted that most of the respondents were veterans in the industry with more than ten years of experience in the field. A sizeable percentage had been in the industry for more than two decades. However, there has been a steep rise on the number of contractors and consultants after the coming of the devolution systems. The new contractors are facing stiff competition in the industry and mostly unable to win tenders to construct roads because of the stringent requirements over the same. The results are shown in table 4.2

Table 4: 4.2 Respondents’ Experience

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years</td>
<td>4</td>
<td>5.5 percent</td>
</tr>
<tr>
<td>Between 6 to 10 years</td>
<td>14</td>
<td>19.4 percent</td>
</tr>
<tr>
<td>Between 11-15 years</td>
<td>11</td>
<td>15.3 percent</td>
</tr>
<tr>
<td>Between 16-20 years</td>
<td>14</td>
<td>19.4 percent</td>
</tr>
<tr>
<td>Above 21 years</td>
<td>29</td>
<td>40.3 percent</td>
</tr>
</tbody>
</table>

Source: Survey Data (2018)

From the study it was noted that 40.3 percent were involved in road projects for more than 21 years, 19.4 percent were involved in road projects for a period of 6 to 10 years, 19.4 percent were involved for a period of 16-20 years, 15.3 percent have been involved in road projects
for a period of between 11-15 years, whereas 5.5 percent of the respondents were involved in road projects for not more than 5 years.

4.2.4 Size of the Contracting Firms

The study sought to determine the size of the contracting firms which were the unit of analysis for the study. The metric chosen to measure the size of the contracting firms was the number permanent skilled workers. However, from observation in the construction sites, the number of casual and temporary employees outnumbered the permanent ones. This was explained on the fact that cost cutting was a common practice and was not uncommon for certain cadre of permanent staff to be operating in many construction sites. The abundant availability of unskilled workers who queued daily for jobs was a common occurrence in almost all contracting firms. This implies that just a few of the respondents who worked with various firms are engaged on permanent basis and each construction firms had at least two permanent employees. This provided good basis for providing reliable information since they have a background of the firm.

4.3 Descriptive statistics for study Variables

4.3.1 Contractor Financial Capacity

The study sought to determine how financial capacity affected the ability of the contracting firms to get loans, have adequate cash flow for operations, settling their dues to various stakeholders such as employees, suppliers and subcontractors, and the effects of late payments by the government on operations. Table 4.3 shows the results
Table 5: 4.3 Financial Capacity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Always Freq.</th>
<th>Regularly Freq.</th>
<th>Rarely Freq.</th>
<th>Never Freq.</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of collateral to secure loans</td>
<td>27</td>
<td>34</td>
<td>4</td>
<td>7</td>
<td>3.13</td>
<td>0.90</td>
</tr>
<tr>
<td>Shortage of operational cash</td>
<td>4</td>
<td>32</td>
<td>27</td>
<td>9</td>
<td>2.53</td>
<td>0.78</td>
</tr>
<tr>
<td>Late payment by the government</td>
<td>23</td>
<td>43</td>
<td>2</td>
<td>4</td>
<td>3.18</td>
<td>0.74</td>
</tr>
<tr>
<td>Late payment of salaries</td>
<td>8</td>
<td>47</td>
<td>14</td>
<td>3</td>
<td>2.83</td>
<td>0.67</td>
</tr>
<tr>
<td>Denial of bank overdraft</td>
<td>11</td>
<td>48</td>
<td>9</td>
<td>4</td>
<td>2.92</td>
<td>0.71</td>
</tr>
<tr>
<td>Late payment of suppliers</td>
<td>6</td>
<td>47</td>
<td>17</td>
<td>2</td>
<td>2.77</td>
<td>0.63</td>
</tr>
<tr>
<td>Nonpayment of subcontractors</td>
<td>13</td>
<td>43</td>
<td>15</td>
<td>1</td>
<td>2.94</td>
<td>0.70</td>
</tr>
<tr>
<td><strong>Aggregate Mean</strong></td>
<td><strong>2.90</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data (2018)

Based on Table 4.4, a majority of the respondents confirmed that they regularly lacked collateral to secure loans but not always (mean = 3.13, standard deviation = 0.90). This finding is in line with the findings of the study by Badu et al. (2012) in Ghana who found out that both small and large contractors found it hard to access funds because of lack of collateral. A majority of the respondents also indicated that they regularly ran short of operational cash (mean = 2.53, standard deviation = 0.78). On the other hand, a majority of the respondents also indicated that they regularly experienced late payments by the government (mean = 3.18, standard deviation = 0.74). When it comes to payment of salaries, a majority of the respondents indicated that that late payment salaries was a regular occurrence (mean = 2.83, standard deviation = 0.67). On denial of bank overdrafts, a majority of the respondents confirmed that they were regularly denied bank overdrafts (mean = 2.92, standard deviation = 0.71). This finding agrees with the findings by Badu et al. (2012) in Ghana, who found out that both small and large contractors found it hard to access funds because of lack of collateral and the structure of their assets that do not impress lenders. Last but not least, a majority of the respondents also indicated that the suppliers were paid late on a regular basis (mean = 2.77, standard deviation = 0.63). Lastly a majority of the respondents also confirmed that there was regular non-payment of subcontractors (mean = 2.94, standard deviation = 0.70). The average aggregate mean of financial capacity of local contractors based on performance
of road projects was at 2.90, indicating that a majority of the respondents agreed that they did not have adequate financial capacity in terms of fulfilling their long term and short term obligations (mean≈ 3.00).

However, based on the standard deviations scores, it can be deduced that there was a slight variability in the views of the respondents to the elements that were used in measuring financial capacity which recorded standard deviation ranging from 0.90 to 0.61. In other words, the views of the respondents regarding to the various elements that measure financial capacity were homogenous.

### 4.4 Technical Capacity of Contracting Firms

The study investigated the technical capacity of the road construction firms by establishing their use of technology, the managerial competence, the quality of their work plans, the quality of safety standards in place to avoid accidents, the application of new methods of construction, along with the management of change in undergoing work. Table 4.4 shows the respondents polling on the above technical capacity constructs.

#### Table 6: 4.4 Contractors’ Technical Capacity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Very good</th>
<th>Good</th>
<th>Average</th>
<th>Poor</th>
<th>Very poor</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of new technology</td>
<td>8</td>
<td>4</td>
<td>17</td>
<td>18</td>
<td>25</td>
<td>1.33</td>
<td>1.01</td>
</tr>
<tr>
<td>Managerial competence</td>
<td>2</td>
<td>5</td>
<td>29</td>
<td>33</td>
<td>3</td>
<td>2.48</td>
<td>0.80</td>
</tr>
<tr>
<td>Making quality work plans</td>
<td>18</td>
<td>31</td>
<td>17</td>
<td>5</td>
<td>1</td>
<td>3.83</td>
<td>0.93</td>
</tr>
<tr>
<td>Avoiding accidents at work</td>
<td>31</td>
<td>15</td>
<td>11</td>
<td>7</td>
<td>8</td>
<td>4.51</td>
<td>1.39</td>
</tr>
<tr>
<td>Application of new methods of road construction</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>40</td>
<td>23</td>
<td>1.90</td>
<td>0.89</td>
</tr>
<tr>
<td>Managing changes in undergoing work</td>
<td>4</td>
<td>6</td>
<td>23</td>
<td>32</td>
<td>7</td>
<td>2.56</td>
<td>0.98</td>
</tr>
<tr>
<td>Aggregate Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>2.77</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Source: Survey Data (2018)**

Based on table 4.5, a majority of the respondents indicated that there was very poor use of new technology (mean=1.33, standard deviation=1.01). A majority of the respondents also
indicated that managerial competence was questionable or rather poor (mean=2.48, standard deviation=0.80). This finding is in line with findings by Worsely (2009) in Kenya who indicated that some contractors who were recruiting managers without managerial skills and experience faced challenges in project implementation. On the aspect of making quality work plans, a majority of the respondents ranked this element as good (mean=3.83, standard deviation 0.93). On the aspect of avoiding accidents at work, a majority of the respondents indicated that this was sufficiently taken care of, thus ranking it very good (mean=4.51, standard deviation= 1.39). Last but not least, when it comes to the application of new methods of construction, a majority of the respondents indicated that this was poorly done (mean=1.90, standard deviation=0.89). This finding is in line with the findings by Bratton & Gold (2012), who reported that the challenge was matching people to skills gaps by contractors as a way of adopting to new methods. Lastly, on managing change in undergoing work, a majority of the respondents indicated that this was poorly done (mean=2.56, standard deviation=0.98). The average aggregate mean of technical capacity of local contractors based on performance of road projects was at 2.77, indicating that a majority of the respondents agreed that they did not have sufficient technical capacity in terms of fulfilling their long term and short term obligations (mean≈ 3.00). Conversely, the respondents view were homogenous in regard to technical capacity and this can be confirmed by a slight variation in the standard deviation scores which ranged from 1.39 and 0.80.

4.5 Organizational Capacity of the Contracting Firms

The study sought to establish the organizational capacity of the road construction firms on areas of monitoring, task allocation, control of cost, co-ordination, supervision and planning for work. The analyzed responses indicated that the road construction firms in Nairobi swayed from good to poor depending on different aspects of organizational capacity. Table 4.5 shows the polling on the different aspects of organizational capacity
Based on table 4.7, a majority of the respondents indicated that there was average monitoring of ongoing road projects (mean= 3.34, standard deviation= 0.79). A majority of the respondents also indicated that there was poor task allocation (mean=2.28, standard deviation=0.89). Steyn (2007) in a study conducted in Malawi confirmed that poor efficiency in task allocation as a result of having improper work plans and work schedules led to overloading staff members. On the other hand, when it comes to controlling the costs of operations, this was ranked as average by a majority of the respondents (mean=3.344, standard deviation=1.10). According to Ahiaga-Dagbui, Love, Smith, & Ackermann (2017) control to include cost control is one of the hallmarks of organized contractors. On the aspect of coordination of work from various departments, this was confirmed to be averagely done by a majority of the respondents (mean= 2.68, standard deviation= 1.12). Last but not least, when it comes to supervision of work, a majority of the respondents also confirmed that this was averagely done (mean= 3.01, standard deviation= 0.96). Lastly, there was good planning for work as indicated by a majority of the respondents (mean= 4.04, standard deviation= 0.88). The average aggregate mean of organizational capacity of local contractors based on performance of road projects was at 3.13, indicating that a majority of the respondents agreed that they did not have adequate organizational capacity to efficiently and effectively
accomplish the various duties (mean= 3.00). On the other hand, the slight variation in the standard deviation scores, which run between 1.12 and 0.88 shows that the respondents view in regard to organizational capacity were homogenous.

4.6 Regulatory Compliance Capacity of Contracting Firms

The study investigated the capacity of the road construction firms in Nairobi to comply with the existing regulatory regime by enquiring on the frequency of occurrence of penalties from the NCA, complains from NEMA, the frequency of occurrences of court cases touching on their performance in road construction, along with the frequency in which they comply to industry standards in construction. It was evident that non-compliance was endemic in the industry as presented in table 4.6

Table 8: 4.6 Regulatory Capacity of Road Construction Firms

<table>
<thead>
<tr>
<th>Activity</th>
<th>Always Freq.</th>
<th>Regularly Freq.</th>
<th>Rarely Freq.</th>
<th>Never Freq.</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penalized by the National Construction Authority</td>
<td>7</td>
<td>57</td>
<td>4</td>
<td>4</td>
<td>2.93</td>
<td>0.61</td>
</tr>
<tr>
<td>Receive complaints from NEMA</td>
<td>32</td>
<td>28</td>
<td>6</td>
<td>6</td>
<td>3.59</td>
<td>0.91</td>
</tr>
<tr>
<td>Face cases in court</td>
<td>32</td>
<td>33</td>
<td>5</td>
<td>2</td>
<td>3.32</td>
<td>0.73</td>
</tr>
<tr>
<td>Following industry standards in construction</td>
<td>23</td>
<td>40</td>
<td>6</td>
<td>3</td>
<td>3.15</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>Aggregate mean</strong></td>
<td><strong>3.15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data (2018)

Based on table 4.9, a majority of the respondents indicated that they were regularly penalized by the National Construction Authority (mean=2.93, standard deviation= 0.61). According to Gacheru and Diang’a (2015) the high rates of penalization was as a result of lack of sensitization and training and lack of reach by the NCA. A majority of the respondents also confirmed that they always received complaints from NEMA (mean= 3.59, standard deviation= 0.91). Apart from that, a majority of the respondents indicated that they regularly faced court cases (mean= 3.32, standard deviation= 0.73). Last but not least, a majority of the
respondents also confirmed that they regularly followed industry standards in construction (mean= 3.15, standard deviation= 0.74). The small variation in the standard deviation scores (0.91 to 0.61) shows that the respondents view in regard to regulatory compliance capacity is homogenous.

4.7 Performance in New Road Projects

Investigation was done on the indicators of performance and this include time, cost and quality, to determine which indicator had more influence on performance than the other.

Table 4.7 presents the results

<table>
<thead>
<tr>
<th>Activity</th>
<th>Always Freq.</th>
<th>Regularly Freq.</th>
<th>Rarely Freq.</th>
<th>Never Freq.</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to complete projects on set budget</td>
<td>5</td>
<td>57</td>
<td>4</td>
<td>6</td>
<td>2.84</td>
<td>0.66</td>
</tr>
<tr>
<td>Doing rework on completed projects</td>
<td>20</td>
<td>43</td>
<td>6</td>
<td>3</td>
<td>3.11</td>
<td>0.72</td>
</tr>
<tr>
<td>Failure to complete projects in designated time</td>
<td>20</td>
<td>43</td>
<td>4</td>
<td>5</td>
<td>3.08</td>
<td>0.78</td>
</tr>
<tr>
<td>Aggregate Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.01</td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data (2018)

Based on table 4.10, a majority of the respondents indicated that they failed to complete projects on set budget (mean= 2.84, standard deviation= 0.66). A majority of the respondents also confirmed that they regularly did reworks on completed projects (mean= 3.11, standard deviation= 0.72). Also a majority of the respondents confirmed that they regularly failed to complete the projects within designated time (mean= 3.08, standard deviation= 0.78). The average aggregate mean of overall performance of road projects was at 3.15, indicating that a majority of the respondents agreed that the roads were not performing well on metrics of time, cost and quality (mean≈ 3.00). In general, the respondents view on overall performance of road projects was homogenous and this can be proved by the small variation in the standard deviation scores which range between 0.66 and 0.78.
4.8 Regression model diagnostic tests

The diagnostic tests conducted included the test for normality and multicollinearity and these are outlined as below.

4.8.1 Multicollinearity Test

Multicollinearity test was done to ensure that there was no correlation between the independent variables. Multicollinearity occurs when the study variables within a data set are highly correlated with each other, and this may have an adverse effect on parameters of measurement in a regression model in such a manner that it may lead to misleading results.

Table 4.8 shows the results for the multicollinearity test

<table>
<thead>
<tr>
<th>Contractor capacity indicators</th>
<th>Multicollinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance Value</td>
</tr>
<tr>
<td>Financial Capacity</td>
<td>0.432</td>
</tr>
<tr>
<td>Technical Capacity</td>
<td>0.418</td>
</tr>
<tr>
<td>Organizational Capacity</td>
<td>0.401</td>
</tr>
<tr>
<td>Regulatory Compliance Capacity</td>
<td>0.521</td>
</tr>
</tbody>
</table>

Source: Survey Data (2018)

The tolerance values for financial, technical, organizational, and regulatory compliance capacities were 0.432, 0.418, 0.401, and 0.521. All these values were greater than the acceptable limit of 0.1 as stipulated by Lewis-Beck, & Lewis-Beck (2015). In addition, the VIF values for all the variables were less than the recommended value 10 as indicated by Fox (2015), and these were 1.563, 2.061, 2.141, and 2.519. To this end, it is, therefore, evident that both the tolerance values and the VIF values showed no correlation between the independent variables, implying that the data was free from any multicollinearity problems.
4.8.2 Normality test

Normality test was conducted on all the variables of the study using the various indicators of the variables and the results are outlined in table 4.9.

Table 11: 4.9 Tests of Normality

<table>
<thead>
<tr>
<th></th>
<th>Kolmogrov-Smirnov</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
</tr>
<tr>
<td>Financial capacity</td>
<td>0.094</td>
</tr>
<tr>
<td>Technical capacity</td>
<td>0.093</td>
</tr>
<tr>
<td>Organizational capacity</td>
<td>0.097</td>
</tr>
<tr>
<td>Regulatory compliance capacity</td>
<td>0.094</td>
</tr>
<tr>
<td>Time</td>
<td>0.090</td>
</tr>
<tr>
<td>Cost</td>
<td>0.090</td>
</tr>
<tr>
<td>Quality</td>
<td>0.089</td>
</tr>
</tbody>
</table>

Source: Survey Data (2018).

From table 4.9, it is evident that financial, technical, organizational, and regulatory compliance capacities had significant values of 0.300, 0.291, 0.299, and 0.301 respectively. In addition, all the performance indicators had a significance value of 0.300 each. Having this results, it was, therefore, concluded that all the independent variables and performance indicators were from a normal population since their significance values were greater than 0.05 as suggested by Norusis (2007).

4.9 Regression Analysis Results

Inferential analysis has been used in this research to establish if there is a relationship between an intervention and an outcome, and also establish the impact of that relationship. The inferential analysis was carried out to establish the relationship between the dependent and the independent variables. This involved computation of both multiple regression
analysis and coefficient determination. The dependent variable in this study was performance of road construction firms while; financial capacity, technical capacity, organizational capacity and regulatory capacity were the independent variables.

4.8.1 Coefficient of Determination

The coefficient of determination ascertains how well a model can forecast outcomes in the future. The $r^2$ is the square of the sample correlation coefficient of the outcomes and the predicted values. Therefore it defines the degree to the variation in dependent variable in relation to the variation in the independent variables or rather the variation in dependent variable. In this case the performance of road construction firms in Nairobi is explained by four independent variables (financial capacity, technical capacity, organizational capacity and regulatory capacity). The coefficient of determination is presented in Table 4.8.

Table 12: 4.8: Coefficient of determination

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Squared</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.889</td>
<td>0.790</td>
<td>0.736</td>
<td>0.32561</td>
</tr>
</tbody>
</table>

Adjusted R squared is the coefficient of determination which illustrates the variation in the dependent variable as a result of changes in the independent variable. The value of the adjusted R squared for this study is 0.736 which is equivalents to 73.6 percent. The implication of this is that 73.6 percent changes in performance of Road projects in Nairobi could be accounted to financial capacity, technical capacity, organization capacity and regulatory capacity. This implies that the four factors are very critical to the road construction sector.
4.8. Multiple Regression Analysis

In addition, the researcher conducted a multiple regression analysis so as to determine the effects local contractors’ capacity on the performance of road projects in Nairobi City County, Kenya. Multiple regression analysis was used to test the influence among predictor variables. The study used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions. The results of Multiple Regression Analysis is tabulated in Table 4.9.

**Table 13: 4.9: Multiple Regression Analysis Results**

<table>
<thead>
<tr>
<th>Model</th>
<th>Un standardized Coefficients</th>
<th>Standardized coefficients</th>
<th>T</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.508</td>
<td>1.131</td>
<td>1.333</td>
<td>0.001</td>
</tr>
<tr>
<td>Financial</td>
<td>0.481</td>
<td>0.228</td>
<td>0.203</td>
<td>2.110</td>
</tr>
<tr>
<td>Technical</td>
<td>0.347</td>
<td>0.127</td>
<td>0.217</td>
<td>2.732</td>
</tr>
<tr>
<td>Organizational</td>
<td>0.416</td>
<td>0.115</td>
<td>0.316</td>
<td>3.617</td>
</tr>
<tr>
<td>Regulatory</td>
<td>0.267</td>
<td>0.103</td>
<td>0.125</td>
<td>2.592</td>
</tr>
</tbody>
</table>

*Source: Survey Data (2018)*

From the computed data the established regression equation was

\[ Y = 1.508 + 0.481X1 + 0.347 X2 + 0.416 X3 + 0.267 X4 \]

Where Y= Performance of road projects in Nairobi County

X1= Financial capacity

X2= Technical capacity

X3= Organizational capacity
X4= Regulatory capacity

The regression coefficient for financial capacity ($\beta= 0.481$, $p= 0.002$), shows that financial capacity is statistically significant on performance. An increase in financial capacity by one unit would cause an increase in performance by a factor of 0.481. This implies that financial capacity positively affects performance.

On the other hand, the regression coefficient for technical capacity ($\beta= 0.347$, $p= 0.003$), shows that technical capacity is statistically significant on performance. An increase in technical capacity by one unit would lead to an increase in performance by a factor of 0.347. This implies that technical capacity positively affects performance.

Apart from that, the regression coefficient for organizational capacity ($\beta= 0.416$, $p= 0.001$), shows that technical capacity is statistically significant on performance. An increase in organizational capacity by one unit causes an increase in performance by a factor of 0.416, at 0.001 level of significance. This implies that organizational positively affects performance.

Last but not least, the regression coefficient for regulatory compliance capacity ($\beta= 0.267$, $p= 0.000$), shows that regulatory compliance capacity is statistically significant on performance. An increase in regulatory capacity by one unit causes an increase in performance of road projects in Nairobi city by a factor of 0.267. This implies that regulatory capacity has a positive effect on performance.
5.0 CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter contains summarized findings, conclusion of the study, recommendations for practices derived from the gaps established from this study along with suggestions for further studies.

5.2 Summary

The aspect of road construction has been a common occurrence in Kenya with the aim of attaining vision 2030. In order to sufficiently attain the latter stated vision, there is need to have increased interconnectedness in terms of infrastructure to include roads. However, the main challenge in attaining this desired end is that the government has at most times hired contractors from China to partake the road projects. This move may be due to lack of capacities of contractors to deliver well performing roads. This study wanted to establish the gaps in the capacity of local contractors working under KURA in connected to performance of roads in Kenya, precisely in Nairobi City County by carrying out an assessment on three main capacities and these are financial, technical, organizational, and regulatory compliance capacities.

This study was guided by several objectives and these were: to determine the effect of financial capacity on performance of road projects in Nairobi City County; to determine the effect of financial capacity on performance of road projects in Nairobi City County; to determine the effect of technical capacity on performance of road projects in Nairobi City County; to determine the effect of organizational capacity on performance of road projects in Nairobi City County, and to determine the effect of regulatory compliance capacity on performance of road projects in Nairobi City County.
Descriptive study design was adopted incorporating the quantitative approach to data collection, analysis, and reporting. Primary data was collected with the aid of questionnaires that were administered among 83 respondents out of which 72 managed to successfully complete and submit the questionnaires.

The patterns in the collected data was analyzed by the aid of descriptive statistics to include frequency, tables, means, along with standard deviations. In addition, multiple linear regression analysis was also used in generating coefficients and their corresponding t-statistics and p-values. As mentioned earlier, the study focused on four independent variables, and these are financial, technical, organizational, and regulatory compliance capacities.

The study found that financial capacity was statistically significant on performance of road projects in Nairobi City County. Technical capacity was also found to be statistically significant on the performance of road projects in Nairobi City County. Last but not least, organizational capacity was also found to be statistically significant on the performance of road projects in Nairobi City County. Lastly, regulatory compliance capacity was found to be statistically significant on performance of road projects in Nairobi City County.

5.3 Conclusion

The various capacities of local contractors have been found to have a significant effect on the performance of road projects within Nairobi City County as demonstrated by the findings for this study. First, the study concluded that contractors’ financial capacity has a positive and significant effect on performance of road projects in Nairobi City County. Given this finding of a positive effect of financial capacity on performance of road projects, the various local contractors should consider looking for avenues that will increase their financial capacity to adequately meet the cost element of performance.
The study also concluded that technical capacity has a positive effect on performance of road projects. Given this fact, the various contractors should consider ways of increasing their technical capacity as it is through this that they will be able to deliver quality projects.

The other conclusion to this study was organizational capacity has a positive effect on performance of road projects. For this reason, the local contractors should consider adopting means of expanding their overall managerial and supervisory capabilities to boost organizational capacity as this will help in enhancing efficiency.

Last but not least, the study concluded that regulatory compliance capacity has a positive effect on performance of road projects. Therefore, the local road contractors should consider familiarizing with and put into practice the various rules and regulation set by relevant authorities such as the National Construction Authority, as this will help in saving their time and costs that may be involved in solving disputes between them and the authorities.

**5.4 Recommendations**

The study makes the following recommendations for industry practice as delineated from the gaps in the findings of the study.

On financial capacity, it is recommended that the local contractors should consider expanding their investments so that they may attract lenders; who will be able to give them loans and overdrafts. Attracting lenders will help the contractors to deal with their various payments on time such as payment of salaries, payment to suppliers, and even payment to sub-contractors.

When it comes to technical capacity, the local contractors should provide the employees with further training. Pursuing further training will help the firm to be able to easily adopt the latest technology in construction, will enhance managerial competence, and will also help in accident avoidance as the trainees may be subjected to safety training in the course of their pursuant of further training.
On the other hand, when it comes to organizational capacity, it is recommended that the local contractors should consider benchmarking on the best contractors. This will help the contractors to familiarize with the best approaches on supervision, monitoring and even controlling.

Lastly, on regulatory compliance, it is recommended that the local contractors should constantly inform their employees of what is expected of them by the various authorities such as the NCA and NEMA. Increasing awareness will help in enhancing compliance.

5.5 Recommendations for Future Studies

The study identifies the following areas as meriting further studies by academicians and researchers interested in the area of performance in road construction and contractor capacity:

- Working capital management practices of contractors in the road construction sector in Kenya
- A comparative study on capacities and performance of both local and international contractors in the road construction industry in Kenya
- Organizational factors and efficiency of road construction firms in Kenya
- Role of supervision capacity on the operational effectiveness of road construction firms in Kenya
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APPENDICES

APPENDIX A: INTRODUCTORY LETTER

RE: CAPACITY OF LOCAL CONTRACTORS AND PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN NAIROBI COUNTY, KENYA

Being an MBA (Project Management option) student from Kenyatta University, I am conducting a research on: CAPACITY OF LOCAL CONTRACTORS AND PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN NAIROBI COUNTY, KENYA. In this regard, I hereby request you to furnish me with some information that will help in meeting my research objectives for this study; which is part of requirement for an MBA degree.

Information provided by you will only be used for purpose of this study and will be treated with levels of confidentiality. The study findings will ultimately assist in improving the performance of construction road construction projects.

Thanks for your cooperation and may God bless you abundantly.

Kind Regards,

........................

Brian Wangwe Simiyu
MBA Student
Kenyatta University
APPENDIX B: QUESTIONNAIRE

BACKGROUND INFORMATION

Kindly tick as appropriate on the section provided on this questionnaires to accurately indicate the correct positions on your role and capacity of contractors in road construction in Nairobi City County.

1. Tick appropriately to indicate where your profession
   
   i. Building contractor ( )
   
   ii. consultant ( )
   
   iii. Road Authority ( )
   
   iv. Engineer ( )
   
   v. Technical Auditor ( )

2. Indicate your highest academic level.
   
   i. PHD ( )
   
   ii. Masters ( )
   
   iii. Degree ( )
   
   iv. Diploma ( )
   
   v. Any other ( )

3. How many years have you practiced in your profession?
   
   0-5 years ( )
   
   6-10 years ( )
   
   11-15 years ( )
   
   16-20 years ( )
   
   Over 21 years ( )
4. Tick appropriately on the size of your contractor firm as determined by the number of permanent employees engaged by the contractor.

<table>
<thead>
<tr>
<th>Size of Contractor Firm</th>
<th>( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than ten</td>
<td></td>
</tr>
<tr>
<td>Between 11-19</td>
<td></td>
</tr>
<tr>
<td>Between 20-29</td>
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<tr>
<td>Between 30-39</td>
<td></td>
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<tr>
<td>Over 40</td>
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</tbody>
</table>

**PART ONE: FINANCIAL CAPACITY**

1. Rate the extent to which the following activities affect this firm’s ability to undertake road construction duties and other obligations using the scale provided.

<table>
<thead>
<tr>
<th>Activity /Rating</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Lack of collateral to secure loans</td>
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<td></td>
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<tr>
<td>b) Shortage of operational cash</td>
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<tr>
<td>c) Late payment by the government</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Late payment of salaries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Late payment of suppliers</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>f) Non-payment of subcontractors</td>
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<td></td>
<td></td>
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<tr>
<td>g) Denial of bank overdrafts</td>
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</tbody>
</table>
PART TWO: TECHNICAL CAPACITY

1. Rate how this firm performs and portrays the following activities and elements using the scale provided.


<table>
<thead>
<tr>
<th>Activity /Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Use of new technology</td>
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<td></td>
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<tr>
<td>b) Managerial competence</td>
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<td></td>
<td></td>
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<tr>
<td>c) Making quality work plans</td>
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<td></td>
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<tr>
<td>d) Avoiding accidents at work</td>
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<td></td>
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<tr>
<td>e) Application of new methods of road construction</td>
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<td></td>
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<tr>
<td>f) Managing change in undergoing work</td>
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</tbody>
</table>

PART THREE: ORGANIZATIONAL CAPACITY

1. Rate how this firm performs the following organizational activities using the scale provided.


<table>
<thead>
<tr>
<th>Activity /Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Monitoring the work done in road construction</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>b) Efficiency in task allocation</td>
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<td>c) Controlling the costs of operations</td>
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<td></td>
<td></td>
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<tr>
<td>d) Coordinating the work of various departments</td>
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<tr>
<td>e) Supervision of work</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>f) Planning for work</td>
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</tbody>
</table>
PART FOUR: CAPACITY TO COMPLY TO REGULATIONS

1. Rate the frequency the following activities occur in this firm using the provided scale.


<table>
<thead>
<tr>
<th>Activity /Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Penalized by the National Construction Authority</td>
<td></td>
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<td></td>
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<tr>
<td>b) Receive complaints from NEMA</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>c) Face cases in court</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Following industry standards in construction</td>
<td></td>
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</tbody>
</table>

PART FIVE: PERFORMANCE OF ROAD CONSTRUCTION PROJECT

1. Rate the frequency the following activities occur in the road construction projects undertaken by this firm using the scale provided.


<table>
<thead>
<tr>
<th>Activity /Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Failure to complete road projects on set budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b) Doing rework on completed projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Failure to complete projects in designated time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C: RESEARCH AUTHORIZATION FROM KU

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

OAR ref: D35/ CITY/FT/22658/2012

DATE: 12th February, 2018

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR BRIAN WANGWE SIMIYA – REG. NO. D35/
CITY/PT/22658/2018.

I write to introduce Mr. Brian Wangwe Simiya who is a Postgraduate Student of this
University. He is registered for M.A degree programme in the Department of Management
Science.

Mr. Brian Wangwe intends to conduct research for a M.A Project Proposal entitled,
“Capacity of Local Contractors and Performance of Road Construction Projects in Nairobi City
County, Kenya”.

Any assistance given will be highly appreciated.

Yours faithfully,

[Signature]

[N.K. LUCY N. MAJERI]
DEAN, GRADUATE SCHOOL
APPENDIX D: RESEARCH AUTHORIZATION FROM NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2123471, 2241493131571, 2218940
Fax: +254-20-3120845318249
Email: dy@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

Ref. No. NACOSTI/P/18/24966/21690

Date: 20th March, 2018

Brian Wangwe Simiyu
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Capacity of local contractors and performance of road construction projects in Nairobi City County, Kenya,” I am pleased to inform you that you have been authorized to undertake research in Nairobi County for the period ending 20th March, 2019.

You are advised to report to the Principal Secretaries, State Department for Infrastructure and State Department for Public Works, the County Commissioner and the County Director of Education, Nairobi County before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a copy of the final research report to the Commission within one year of completion. The soft copy of the same should be submitted through the Online Research Information System.

DR STEPHEN K. KIBIRE, PH.D.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Principal Secretary
State Department for Infrastructure.

The Principal Secretary
State Department for Public Works.
APPENDIX E: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MR. BRIAN WARGWE SIMUYU
of KENYATTA UNIVERSITY, 43844-100
NAIROBI has been permitted to conduct
research in Nairobi County

on the topic: CAPACITY OF LOCAL
CONTRACTORS AND PERFORMANCE OF
ROAD CONSTRUCTION PROJECTS IN
NAIROBI CITY COUNTY, KENYA.

for the period ending:
20th March, 2019

Applicant's
Signature

Permit No.: NACOSTI/P/18/24966/21690
Date Of Issue: 20th March, 2018
Fee Received: Ksh 1000

Director General
National Commission for Science,
Technology & Innovation