COLLEGE OF BUSINESS AND ECONOMICS DEPARTMENT OF MANAGEMENT MSC IN TOTAL QUALITY MANAGEMENT AND ORGANIZATIONAL EXCELLENCE

Total Quality Management (TQM), Competitive Advantage and Ownership in Ethiopian Construction sector

"A Thesis submitted Addis Ababa university college of business and economics in partial fulfilment of the requirements for the Master of Science (MSC) degree in Total quality management and organizational excellence."

BY: Netsanet Berhanu

ADVISOR: Ethiopia Legesse Segaro (D. Sc.)

Addis Ababa

2019

Declaration

I, the undersigned, declare that the thesis entitled ***Total quality management (TQM), competitive advantage and ownership in Ethiopian construction sector*** is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been properly acknowledged. It is offered for the award of the degree of Master of Science in Management Specialization in Total Quality Management and Organizational Excellence from Addis Ababa University.

Name: **Netsanet Berhanu** *Name:* **Dr. Ethiopia legesse**

Signature: _____ *Signature:* _____

Place: Addis Ababa University: Collage of Business and Economics

Department of management

Date: 2018

Statement of certification

This is to certify that the thesis prepared by Netsanet Berhanu entitled: ***Total quality management (TQM), competitive advantage and ownership in Ethiopian construction sector,*** and submitted in partial fulfillment of the requirements for the degree of Master of Science in Management Specialization in Total Quality Management and Organizational Excellence compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

Approved by:

Internal Examiner	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____
Advisor: Dr. Ethiopia legesse	Signature	Date
Dr. Ethiopia legesse	_____	_____

Acknowledgements

First and foremost, I would like to thank God for giving me the courage to complete this research. Thank you lord for making everything possible.

The support I have received throughout the process needs much recognition, I am taking this opportunity to officially thank all the people who has helped me directly or indirectly.

I would like to express my deepest gratitude to my advisor Dr. Ethiopia Legesse for her assistance and mentorship throughout the course of my research. I am very grateful for her guidance, facilitation of some resources and feedback from the start to finish.

I would also like to acknowledge Yonathan Samuel, from Ministry of Urban Development and Construction, and Qawwee Jarso from investment agency bureau for providing me with valuable information and all construction data. I want to thank all the managers of construction firms for taking time to respond to my questions and all respondent who partook in the survey on the practice of TQM and its effect on competitive advantage. I extend my appreciation to Almaze Tesfaye and Dr. Mahelet Getachew for providing me with literature materials, all invaluable aid and advise throughout the research.

I would like to thank all my family and friends for all their love, and continuous encouragement. I extend special appreciation to my father Berhanu Tegegn for his limitless support through this study. My heart felt deepest gratitude goes to my sister Nardiye for being the reason for my achievements, I don't know what to do without you. I would also like to thank, my other sisters Biruketawit and Rahawa, and my bro Abel, my friends Bethlehem.F, Eyosisas, Melake, Yosef, Mahilet, Bethlehem Z, Kalikidan and Tesfu who have been helpful from the beginning and who have never failed to encourage me, I thank you all from the bottom of my heart.

Finally, I would like to dedicate this paper to my mom!

Table of Contents

List of Figures

List of tables

Acronyms and Abbreviations

ANOVA = Analysis of Variance

BC = Building contractors

CA = Competitive advantage

CF= customer focus

CI = Continuous improvement

CSR= Consumer Supplier relationship

GC= General Contractor

GDP= Gross domestic product

OS = Ownership status

TMC= Top management commitment

PM= Process management

PROM= process management

RC= Road Contractor

SPSS = Statical Process Social Science

TQM = Total Quality Management

Abstract

The aim of this study is to examine the effect of TQM on competitive advantage and ownership in construction firms in Ethiopia. The main objective of this study is to determine whether ownership type (foreign Vs local) construction firms apply the practice of total quality management system (TQM) in their perspective firms and consequently whether ownership status affects the competitive advantage of the firm.

The research method utilized in this study is mixed method approach which includes both quantitative and qualitative data collection techniques, and analysis procedures. The study employs descriptive and explanatory (descripto-explanatory) research design for quantitative approach and exploratory research design for qualitative approach.

A survey questionnaire and interview questioner is designed based on the research questions, objectives and literature review in which is distributed to 69 firms and 51 questioners were collected. Descriptive, correlation, linear multiple regression and independent sample t- test statistical tools were used to examine the relationship between Total Quality Management and ownership and also the relationship between Total Quality Management and competitive advantage.

Based on the results The result of the research supports the expectation that firms with good TQM practice in both foreign and local owned firms gives better competitive advantage.

Key words: Total Quality Management (TQM), Competitive advantage (CA), Ownership, construction firms

Chapter 1: Introduction

1.1. Background of the Study

Total quality management is an approach to improving the competitiveness, effectiveness, and flexibility of the whole organization (Pheng and Teo,2004). The importance of Total Quality Management (TQM) in the construction industry has long been discussed. As cited by Hoonakker et al (2010) and Oakland and Aldridge (1995) 'if ever an industry needed to take up the concept of Total Quality Management, it is the construction industry'. Kanji and Wong (1998) as cited in Hoonakker (2006) argue that quality management has increasingly been adopted by construction firms as part of fulfilling customer needs and quality improvement. According to Pheng and Teo (2004), TQM can be used to increase quality and productivity. Erande and Pimplikar (2016) listed seven critical success factors for TQM in the construction industry. These are (i) Top management commitment, (ii) Continuous improvement, (iii) Customer focus, (iv) Training of employees, (v) Employee satisfaction, (vi) Process management and (vii) Supplier chain management.

Recently Ethiopia's series of policy reforms targeting at opening up the economy and encouraging local and foreign direct investments resulted in the establishment of a number of construction firms (Ayalew, Dakhli and Lafhaj, 2016). According to a recent study conducted by Zewdu and Aregaw (2015), the contribution of the construction industry to Ethiopia's GDP increased to 5.6% making it closer to the sub-Saharan average of 6%. Despite the noticeable growth since 2001, the construction sector has faced some capacity and quality-related limitations (Ayalew, Dakhli and Lafhaj, 2016).

Many firms are faced with a changing business environment because of globalization, innovation, technological progress, and changing regulations (Czinkota, 2005). The bigger the construction project, the higher the customer needs and standard (Pheng and Teo, 2004). Based on the researcher's own anecdotal observations in the Ethiopian construction sector, foreign-owned construction firms are more likely to get bigger projects and local-owned firms are less likely to win bids from major clients. This observation compelled the researcher to wonder if this general trend in favor of foreign-owned companies displayed by Ethiopian clients (state or private) over their local counterparts is a result of the long-established foreign companies' TQM practice.

The presumption that ownership could affect management practices and firm performance is based on the findings of previous studies. Several studies find evidence that foreign-owned firms in

developing country have significantly better performance than local-owned business (Gunduz and Tatoglu, 2003; Aydin and Sayim, 2007; Wiwatanakantag, 2001).

Among the various causes for high performance of foreign-owned companies in attracting more lucrative businesses and delivering better quality Aydin and Sayim (2007) argue generous incentive for managers and adopting productivity-boosting technology take precedence. Wiwatanakantag (2001) argues that foreign-owned firms have firm-specific advantages related to the ownership of an advanced technological know-how or a subsidy from their own governments. This study investigates whether foreign-owned construction firms perform better than local-owned construction firms. This study aims to identify whether it is TQM or other relevant variables that primarily affect a firm's performance give rise to competitive advantage.

1.2. Statement of the Problem

The implementation of TQM has long been discussed and recently many organizations are becoming familiar with the practice and implementation of TQM. There are several studies dealing with the implementation of TQM (Pheng and Teo, 2004). However little emphasis is given to the effect of TQM on competitive advantage and ownership in Ethiopian construction sector. This paper fills literature gaps by analyzing different possible determinants of TQM particularly in the construction industry. The researcher examines whether the firms' ownership plays a role on the implementation of TQM and study implications for competitive advantage in construction firms.

TQM is a combined effort among all level of employee and organization function to increase customer satisfaction though continuous improvement.

Even if the TQM originally implemented by manufacturing firms, the practice of TQM in construction industry is long overdue. Despite each construction project are unique in nature, has longer life cycle relative to manufacturing products and highly influenced by owners of the project, construction firm can benefit from the application of TQM as a means of increasing quality and efficiency in today's competitive environment where time and resources are scared and reworks and delays are unacceptable in construction industry (Arditi and Gunaydin, 1997).

Based on the researcher own anecdotal observations in the Ethiopian construction firms there is a lot of mismanagement that results in unsatisfied customers due to the delay of delivery of project. This could be as a result of highly discouraged employees due to late payments, miscommunications and so on.

Because the construction projects are poorly managed, the top management is witnessing the effect as clients leave to another company. This eventually will cause the decrease in firm performance. To the researchers' knowledge, most construction firms are more focused on the payment rather than quality of the work. This being said there are also many firms that follow the norm and ethics that are laid by the construction law and deliver their projects with the specified timeline and quality: satisfy their clients' needs, have highly motivated and humble employees. It's the researcher's assumption and understanding that these firms maybe well equipped with capital, experiences and strong management system.

Studies conclusively indicated a significant positive effect of implementing TQM in terms of motivating employees into delivering better quality that will satisfy customers, build good company portfolio and bring more business. Several studies (eg. Irfan & Kee, 2013, Samson & Terziovsk, 1999; Hendricks & Singhal, 1997; Powell, 1995) support this by revealing direct relationship between practicing TQM and improved firm's performance.

Based on theoretical model, several studies (Curkovic & Pagell, 1999, 1992; Hewitt, 1994; Reich, 1994; Seawright & Young, 1996;) predicted and confirmed that TQM practice can bring competitive advantage. It's known that a firm is as strong as its leaders, employees, customers and its management system, this is where ownership comes to be a factor: most foreign firms in the Ethiopian construction industry are awarded with many projects like high rise buildings, bridges and dams. To the researchers' point of view this could be because two reasons.

The first one is that the foreign construction firms are more financially capable than the local construction firms; for instance, Salini contractors could be taken, this firm is Italian owned and currently working on lots of projects in Ethiopia, Ethiopian Renaissance dam can be taken as a good example.

The second reason could be having a solid management system. The foreign construction firms have a rich background in having a strong management system. Ethiopian managers may not be as experienced as European or Chinese in the management of larger projects. (alliance experts, 2018).

To the researcher knowledge, this study is the first comparative study that compares the practice and implementation of TQM across foreign and local owned construction industry in Ethiopia and understanding it is the implication on competitive advantage. This will provide a useful insight into the difference and similarities across firm ownership, and fills the literature and knowledge gap on to what extent TQM is practiced in the construction industry.

1.3. Research Questions

To achieve the purpose of this paper the below research questions are formulated:

What is the effect of TQM on competitive advantage and how does ownership (foreign or local) affect this in the Ethiopian construction industry?

1. What is the level of TQM practice and implementation in the Ethiopian construction sector?
2. How does the practice of TQM differ across firm ownership (foreign versus local) and what is its implication on competitive advantage?
3. Do foreign-owned firms have a better competitive advantage over locally owned firms?
4. What are the possible constraints that firms face in practicing TQM?
5. Is TQM more effective foreign-owned vs local construction firms? If so what are the mechanism used to measure its effectiveness and what are the reasons for ineffective TQM? What are the possible suggestions?

1.4. Obejectives of the Study

1.4.1 General objective

- To examine the effect of TQM practices on competitive advantage and examine the effect of ownership (foreign or local) on TQM in the Ethiopian construction industry.

1.4.2. Specific objectives

Based on a sample of construction firms in Ethiopia, some of which are foreign-owned whole others are locally owned, we address the following objectives.

1. Understand the practice and implementation of TQM in the Ethiopian construction sector.
2. Compare the practice and implementation of TQM across foreign and local owned construction businesses and understand it is implication on competitive advantage.
3. Examine possible whether foreign-owned firms may have a better competitive advantage over local owned firms. If so, identify the possible reasons.
4. Identify possible constraints that firms face in practicing TQM.
5. Determine the effectiveness of TQM among local and foreign owned construction firms. Identify the mechanism used to measure effective TQM, explore possible reasons for ineffective TQM.

1.5. Significance of the Study

The results of the study can be used to create awareness on the effect of TQM on competitive advantage and the role of ownership (local or foreign) towards it. The study also helps managers to focus more on practice and implementation of TQM for better firm performance. The results of the study can be used to modify and enhance current practices of construction firms in Ethiopia. The study can also be used by researchers and other interested parties who may have due interest in this area. The researcher presumes, the results obtained by investigating the competitive gains of practicing TQM will benefit local managers, owners, practitioners and future investors in Ethiopian construction industry.

1.6. Delimitation/Scope of the study

This paper focuses on assessing the effect of TQM on competitive advantage among foreign and local firms. The results obtained in this study are specific to the construction industry in Ethiopia. To conduct the research within the given timeframe and to reduce cost of conducting the study, the researcher limited the sample to only grade one general construction (GC) firms located in Addis Ababa, Ethiopia. An in-depth study will not be conducted due to resource and time limitations.

1.7. Definition of Terms

1. Total quality management (TQM): The Japanese define TQM as a management philosophy which is characterized by being scientific and based on data and logic. It also involves being systematic firm wide, which requires operations to be structured (e.g. ISO 9000) and universal (Abu Hassan, 2011).
2. Competitive advantage- firm's ability to achieve market superiority or superior position over its competitors, (Barney, 1991).
3. Foreign and local owner (National origin of the owners): Firms' ownership can be grouped in to governmental or local and foreign shareholders (Abdul Hamid and Atan, 2011). According to the World Bank Enterprise Survey conducted in Ethiopia (2015), local-owned firms are owned by nationals of the country in which the establishment is located. If foreign nationals own a firm, then it is considered as foreign owned. A joint venture is classified as foreign if 10% of the business is foreign-owned.

1.8. Organization of the study

This study is organized in to five chapters which includes.

Chapter one: Introduction

In this chapter includes: Background of the study, statement of the problem, research question, objective of the study, significance of the study, definition of terms and delimitation/ scope of the study.

Chapter two: Review of related literature

This part covers the definitions and related facts of the key concepts such as Ownership (Foreign Versus local), TQM and competitive advantage and related theories as discussed by different authors and scholars and hypothesis developed from the theories reviewed. It also includes the practice and implementation of TQM in Construction industry and conceptual frame work

Chapter Three: Research Methodology

This chapter describes the research design, sample and sampling techniques used, type of data collection and tools/ instruments for data collection and procedures of the collected data. It also discusses the methods of data analysis, measurement of the variables, the reliability and validity of the variables used and ethical consideration used.

Chapter Four: Research Data Analysis and Discussion

This section discusses the descriptive analysis of respondent's profile, background information of the firm, firms' communication techniques and competitive advantage. the chapter also incorporates correlation, regression diagnostics analysis including the assumptions made and hypothesis testing is performed by using linear multiple regression analysis and independent sample t- test. It also includes the analysis of data gathered from the interview.

Chapter Five: Summary, Conclusion and recommendation.

This chapter presents the overall summary of the data, conclusion and recommendation made from the analysis made. It also includes suggestion for future study.

Chapter 2: Literature Review

This chapter critically reviews existing literature, lays a conceptual framework and develop research hypotheses to provide insight on the topic at hand. There is various research presenting interesting theories and findings related to TQM practices and implementation, competitive advantage and firm ownership. Understanding these broad concept & theories are important before conducting in-depth research or focused analysis on the practice of TQM in Constriction firms in Ethiopia.

2.1. Total Quality Management(TQM): Basic concept

First, the researcher will examine literature and theories around TQM as the research mainly focus on this. This part will review and summaries TQM basic concepts, definitions, variables, how does it work, what are some issues and possible solutions.

2.1.1. History of TQM and Key Definitions

The roots of Total Quality Management (TQM) can be traced back to as early 1920s when Hawthorne experiment showed workers productivity is impacted by participation. This was followed by the development of a statistical theory for quality control by Walter Shewhart in the 1930s (Westcott, 2005).

The concept further developed in Japan in the late 1940s when different parties including unions, engineers' government official, and scholar dedicated themselves to improve productivity and enhance their post-war quality of life (Powell,1995). Which can also be marked as the origin of TQM. In 1950's the quality guru Deming and Juran, started to train and teach statistical quality control and a managerial breakthrough for Japanese engineers (Westcott, 2005). Through time the concept extended from quality of products to the quality of all issues including non-manufacturing and manufacturing functions within the organizations and possible practice in service and nonprofit organizations. (Powell,1995).

Today there is a remarkable spread in the use of TQM in both manufacturing and non-manufacturing firms (Chonga Rundusb, 2004). This concept is also applicable in the construction industry. For instance, the Japanese construction firms started implementing TQM in 1970.

This shows that TQM is applicable not only for industries that perform mass production but also for firms with a creative and one-time process like construction firms. (Arditi & Gunaydin,1997). There is no generally accepted TQM definition; however, several key studies attempt to define it. This includes but not limited to:-

Table 2.1. Key TQM definitions

Besterfield et.al (2003)	*"Total Quality Management (TQM) is an enhancement to the traditional way of doing business. It is a proven technique to guarantee survival in world-class competition. Only by changing the actions of management will the culture and actions of an entire organization be transformed. TQM is for the most part common sense by analysing the three words, we have: -* ➢ *Total - Made up of the whole* ➢ *Quality - Degree of excellence a product or service provides* ➢ *Management - Act, art, or manner of handling, controlling, directing, etc."*
Kayna (2003)	*"TQM can be defined as a holistic management philosophy that strives for continuous improvement in all functions of an organization, and it can be achieved only if the total quality concept is utilized from the acquisition of resources to customer service after the sale."*
Pheng & Teo(2004)	*"TQM is an approach to improving the competitiveness, effectiveness, and flexibility of the whole organization."*
Kanji & Wallace(2000)	*"TQM is the culture of an organization committed to customer satisfaction through continuous improvement. This culture varies from one country to another and between different industries, but has certain essential principles, which can be implemented to secure greater market share, increased profits, and reduced costs."*

From the above definition, it can be inferred that TQM is a holistic approach that focuses on continuous improvement and helps to improve efficiency, effectiveness, quality, and competitiveness of the whole organization. In order to have improved firm performance effective implementation is important as shown in Flynn et al., (1995), Ittner and Larcker (1996), and Easton

and Jarrell (1998) studies (cited in Hendricks & Singhal, 2000). These studies provide evidence that highly practiced and effectively implemented TQM improved a firm's quality performance, long-term profitability and return on investments. The following sections give a brief overview of the implementation process and features/basic concept of TQM.

2.2. TQM in the construction industry

The construction industry is sector of the economy that transforms various resources into constructed physical economic and social infrastructure necessary for socio-economic development, Boere, et al (2015). It embraces the process by which the said physical infrastructures are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished. The construction industry has been criticized for long for lack of productivity, quality and performance than any other industry, (Loushine & Hoonakker, & Carayon, & Smith, 2006; Nesan & Holt, 1999). Quality has been a major issue in the construction industry.

Quality in construction firms could mean similar thing as other industry, meeting customer expectation (Pheng & Wee, 2001 and Love and et al. 1999) or compliance with ISO criteria (Sun 1999); delivering on time within the budget (Kiwus & Williams, 2001; Love et al., 1999) and more. As client's demand more inclined to improved service quality, quick delivery and better innovation in technology, it is important for construction firms to adopt concepts are more successful in other industry like TQM (Hoonakker et al. 2010).

TQM is more associated with manufacturing and service industries, the practice of TQM is now applied to construction as clients increasingly demand a high standard needs and to solve quality problems (Kanji & Wong, 1998).

According to Oakland and Aldridge (1995, p. 1): ‘if ever an industry needed to take up the concept of TQM it is the construction industry' However the practice and implementation of could be challenging, as many parties are involved in the construction process and there is a lack of standardization (Hoonakker et al. 2010).

According to Hoonakker et al. (2010) the implementation of TQM is not an easy matter for construction firms as such some of the challenges include:

1. the nature of the construction process: the construction process is very large, labour-intensive and complex, situated in different places. The nature of the process is so complex and several parties with different interest are involved. This is one of the main challenges for the construction industry as most of the parties involved in this industry are more of confrontational than cooperative; which resulted in claims among different parties (Kanji & Wong, 1998).

2. Several parties involved: in the construction process the main participant involved are the owner(consumer); the architect, and the general contractor (working with several sub-contractors and supplier). All the parties involved are trying to protect their own interest; as such the owner, would like to spend as little as possible and the contractor tries to provide the service that maximizes its profit. Also, the supplier and sub-contractor involved have a different size which impact the implementation of TQM.

3. Non-standardization: In construction industry quality assurance is difficult as there is no universal or standard the process and product (Rowlinson and Walker, 1995). Quality is often at risk as a frequent change to details of the design of the project are normal.

4. Bidding process: some bindings are only open to main contractors; this contractor makes their own selection of supplier and subcontractors. To have competitive bidding and healthy profit margin contractor might select cheaper or reduce the allotted resources. This might result in safety and quality issue as well as the delay in the completion of the project.

Even if it is difficult to implement TQM in the construction business, it is important to carefully implement TQM as it gives more benefit like improved quality, customer satisfaction, productivity, and efficiency. (Indris et al, 1996).

2.2.1. Overview of the Ethiopian construction industry

The construction sector plays a vital role in the Ethiopian economy as it created more than 1.8 million jobs and accounts of a 9.5 % share of Ethiopian's 2016 GDP (Derso,2018). The Construction Industry in Ethiopia has been vastly growing. There are so many projects undertaken many residential, condominium, apartments, moles, high-rise buildings, roads, and dams which also including the Grand Ethiopian Renaissance Dam, the largest project under construction in East Africa, with a value of approximately US$4.1bn (Veitch, 2018).

Firms must be register and licensed either by the ministry of urban development and construction (if it is local) or investment bureau (if it is foreign) in order to undertake construction work in Ethiopia (Boere, A. et al., 2015). The existence of European owned construction firms scares; on the other hand, Chinese companies play a major role in Ethiopia's infrastructure development (Boere, A. et al., 2015).

In Ethiopia, construction firm has established a categorized and grading system that helps to ease the tender process. These categories which have grade 1 to 10 include (See Appendix C for detail) general contractor, building contractor, road contractor and specialized contractor) and Foreign companies should be grade one to participate in a national bidding system (Boere, A. et al., 2015) Teferi Awlachew, Director, Splenor Technology PLC, suggested that construction project needs a firm management process that helps to save time and achieve deadline as both foreign and local owned construction firms facing inefficiency's that resulted in high cost, low quality and late delivery (Boere, A. et al., 2015).

Recently Ethiopian construction firm is becoming ISO certified as they are becoming more and more aware of the importance of quality. To the researcher knowledge, there is no information to what extent Ethiopian construction firm practices TQM, to find out the researcher developed a questionnaire and will collect primary data.

2.3. Implementation process, Features of TQM and Challenges of TQM

The implementation of TQM could be a difficult process as it is a major change for an organization. For this reason, with the implementation of the TQM process, it is important to assess and align the internal and external environment the firm is operating on (Mersha, 1997). If the organization has effective responsiveness from the internal and external environment, implementation will be easier. To sum up, a firm needs to be healthy enough to begun TQM. TQM will not be suitable if the firm is facing issues like a technological problem, access to funds, inadequate worker, and weak managerial issues (Tichey,1983). TQM implementation process differs in every organization. Several studies (Lascelles & Dale, 1990 & Porter and Parker, 1993) support this and concluded that the implementation process is firm-specific.

According to Low and Peh (1996) to introduce TQM culture in construction environment it is important to have a team (main & sub-contractors) who is committed to the quality process and have a positive attitude towards quality. Thus, the top manager or the general contractor should select those sub-contractors that can demonstrate quality attitude and good work performance (Low and Peh, 1996).

As per Kaynak (2003) and Harris &McCaffer, (2002) TQM involves the entire organization with a continual effort to improve quality and customer satisfaction. TQM consist of all activities that management carries out to improve quality. This includes quality planning, quality control, quality assurance, and quality improvement. (Harris &McCaffer, 2002). According to Saeed & Hasan, (2012), the three things that could base the philosophy and concept of TQM are - Customer satisfaction, employee involvement, and process improvement.

For Construction firms, the basic step of implementing TQM in construction projects as laid out by Low & Peh(1996) are:- "Obtain the commitment of the client to quality;

1. Generate awareness, educate, and change the attitudes of staff;
2. Develop a process approach toward TQM
3. Prepare project quality plans for all levels of work
4. Institute continuous improvement
5. Promote staff
6. participation and contribution using quality control circles and motivation programs; and review quality plans and measure performance."

TQM principles in construction could be particularly difficult because of lack of standardization and the many parties involved. Some of the challenges and barrier in implementation has been reviewed and discussed in the next section.

2.3.1. Challenges in Implementation

As part of the implementation process, it is important to assess the internal and external environment of the firms. This will help to identify challenges and issues that could hinder successful implementation.

Many organization faces different challenges while implementing TQM, these include but not limited to high implementation cost. The bigger the size the more resources to invest on TQM;(Powell, 1995); however, adverse employee response to change, communication problem and diversification of products or project, higher operational complexity might make the TQM difficult (Duh et al, 2012). Furthermore, a degree of market competition can either pressure firms to implement TQM (Chenhall, 1997) or reduce all the possible costs to gain a competitive position.

In addition, different studies (Bayazit, 2003; Rad, 2005; and Bhat and Rajashekhar, 2009) conducted on different sectors showed that internal challenges including lack of planning and quality of resources, difficulty of having company specific model, lack of knowledge or commitment by top managers and lack of employee involvement, low intensive or wage for employees and employee resistance to changes affect the implementation or process TQM.

Thus, understanding organization internal barriers are a very useful starting point to top managers, since the way it is introduced first can lead to unsuccessful TQM implementation. In addition, managers need this information as they are prone to fundamental mistakes related to communication, training, infrastructure, teams and project involvement, problem-solving and management.

2.3.2. Solutions to overcome challenges

Ramachandran (2010) and Mahmood and Mohammed (2008) said that the implementation of TQM requires a culture change and change in management behavior. Love et al., (2000) also support this behavioral and thought change in the mind of practitioners, academics and professional institutions is important to improve its performance and competitiveness. Thus, it is important to have top management commitment, employee involvement, training and education

as key factors in the implementation of TQM. In addition, customer value to quality and supplier commitment to quality are among important factors to overcome challenges in the TQM process. The key success in factor in the implementation of TQM will be discussed in detail in the section below.

2.4. Elements and Outcomes of TQM

TQM is an issue of growing interest in contemporary business, the practice of TQM has long been discussed and even becoming more visible in developing countries (Baye and Raju R, 2016,). TQM has been the study of several kinds of literature. There is no general agreement on the elements that formulate TQM (Corredor & Goni, 2011), the variables or element used depends on the goal of the research(Munizu,2013). As such some studies focused on the technical aspect, while some focus on only general management philosophy of TQM. But few studies (Saraph et al.,1989; Anderson et al.,1995, & Motwani, 2001) looked at the holistic pictures when identifying TQM variables.

Thus, after reviewing selected literature 6 TQM constructs elements the meets the study objective and give holistic view were identified. This consists of Top management, leadership commitment; Customer Focus, people management, process management, continuous improvement, close relationship with the supplier. This CSF are discussed in detail below are used by different kinds of literature (Arditi and Gunaydin,1997, Abusa, 2001, and Baye and Raju R, 2016)

Top management, leadership commitment

Top management commitment is one of the most commonly discussed critical success factor(CFS) of TQM practice in different studies (Saraph et al, 1989; Flynn et al 1994; Ahire et al, 1996; and, Motwani, 2001). These studies developed top management commitment, top management support, leadership, as part of TQM critical success factors.

As previously stated TQM requires a cultural change. Puffer and Mcarthy (1996) argue that top management ability to create a vision and promote change is an important part of TQM successful implementation. Top managers need to lead the transformation of firms in the TQM process, they must accept personal responsibility and be dedicated to empowering other employees to accept the change (Reed et al., 2000). TQM literature suggests that leadership should show both directive and supportive behavior. (Reed et al.,2000). Crosby (1996) said that top management should lead by example and show commitment by participation and attitude.

According to Saraph et al. (1989), top management roles include accepting of quality responsibility first, followed by compressive quality planning and goal setting focusing on cost and timely delivery. Top management should participate and be evaluated in the quality improvement effort. Overall the top manager job as a leader is to show the consistency of purpose and their focus on quality (Deming 1986). It is also unanimously agreed by authors to have successful TQM practice Top management should show long-term commitment (Reed et al.,2000).

The action of top management affects TQM implementation as they need to train, communicate organizational value and cultures and avail resources that improve process effectiveness and efficiencies (Reed et al., 2000). Motwani(2001) exemplified TQM as constructing a house and top management commitment is important as we need a strong foundation to stand a house. In other words, it is impossible to build a great house on a weak foundation. Once we have a strong foundation, attention should be given to people management and training, customer focus, process management and supplier relationship as part of different pillars of a house. Within this context, quality should be the top of the agenda for every meeting and communication. The manager as a leader support, facilitate or coach employees to be better in their job and to have an effective process and to efficiently use resources and equipment.

To sum up, Top management leadership and commitment refers to the ability and responsibility to direct internal operation towards satisfying customers' needs (Deming, 1982Samson and Terziovski(1999) showed that a strong association between top management commitment and performance; also Shenawy and et al(2007), found that strong association with competitive advantage. Therefore, for this study top management leadership and commitment is selected as one of the independent variables that affect TQM.

A. Customer Focus/Feedback system

In most cases, quality is referred to like features of products/projects that are tailored with customer needs to provide product satisfaction (Sommerville and Robertson, 2000). customer satisfaction comes from product satisfaction that also drives market share and profits (Juran, 1992).

According to Feigenbaum, (1991) quality is defined by the customer. In this case, a customer refers to both internal and external recipients of a firm's products (Dean and Bowen,1994). Whatever the firm took to improve quality: whether employee training, upgrading computers, equipment or software, integrating quality in the design process; customer plays a major role in determining the level of quality(Westcott,2006). This means their needs and desires define quality

for the producer/contractor whose job it is to meet or exceed the customer's needs and expectations through continuous improvement, problem-solving and managerial process (Dean and Bowen,1994). This makes customers the most important part of the production line (Deming, 1986).

To sum up, customer focus is the core principle that guaranties firms' success through customer satisfaction. (Dean and Bowen,1994). That is why central to all TQM focus on the customer, In addition, a focus on customers helps an organization to do the right things (Yusuf et al., 2007). To do so Firms need a strong feedback system to consistently measure customer requirement and to address customer complaints in a timely manner (Talib et al., 2010).

B. People management

Firms that follow TQM principles allow total employee involvement to work towards a common goal by availing proper resources and environment (Westcott, 2006). people management in TQM refers to the extent to which employees are trained, developed and empowered to be capable of performing an operational procedure to have an effective and efficient process (Mosadeghrad, 2014).

This means people management that makes effective use of TQM techniques mainly focus on - selecting the right person for the right job, commitment to employee learning and development, teamwork, employee motivation, and Satisfaction.

Proper employee selection and recruitment that is consistent with the firm's principle to quality is an important step for TQM (Abusa,2011). This followed by effective communication and orientation about the organization mission, values, goals, information about duties and responsibilities and their involvement in quality standards of a specific job (Daft, 1998).

As cited in Reed & et. al, (2000), training and education are one of the pillars of TQM (Crosby,1979) and should be given continuously to all employees including the CEO (Ishikawa, 1985). To make quality happen it is important that the entire hierarchy in the firms are trained (Juran, 1989, 1992) (cited in Reed & et.al., 2000). Once employees are well trained, the manager needs to respect their ability and know-how, on the work they do. Development programs provide extensive education to help individuals keep up- to- date on their jobs and to prepare themselves for new responsibilities.

Teamwork provides firms with a structured environment to successfully implement and continuously practice TQM. The goal of the team approach is to have every department get

involved. (Arditi and Gunaydin, 1997). In the case of construction companies, this includes owners, designers, contractors' vendors, and subcontract. (Arditi and Gunaydin, 1997). Proper communication and team- participation skills required in an open, quality improvement work environment. This means continuous quality awareness by all employees is important (Saraph et al.,1989).

Effective supervision in handling quality issues by giving timely feedback when quality is not maintained; at the same time recognizing and rewarding employees for superior quality performance important means to measure TQM (Saraph et al. (1989).

C. Process Management

The focus of process management is to incorporate a preventive and proactive approach to quality management that minimize employee error (Saraph et al, 1989; Flynn et al., 1994; Claver et al. 2003). This should be done without losing flexibility and creativity of firm's environment (Idris and Zariri, 2006). To do so it is important to give clear process instruction to employees. To ensure effective process management is in place different practice like defect prevention process, having well-defined and written firms working process, in-process measures of quality, perfection, and quality in the project should be practiced and monitored (Fuentes, Motes et al., 2006). As part to process management, it is important to measure and to keep a record of quality performance (Samson and Terziovski, 1999).

D. Continuous improvement

Per Iruobe et.al, (2012) "Continuous improvement is the philosophy that seeks to make never-ending improvements to the process of converting inputs into outputs." To further elaborate the key point of view is continuous improvement always push to improve and involve everyone in the firm to meet the organization goal by fulfilling customer needs.

Kaizen, a Japanese term, is often considered as a synonym with continuous improvement (Abusa, 2011). The cycle of kaizen activity can be defined as: "Plan → Do → Check → Act" also known as the PDCA model that was created by Shewhart (Westcott, 2001).

With the help of JICA, Ethiopia adopted the Kaizen's principles of 5S to improve the flow of people in workplaces, to put balance in assembly lines and to improve workplace layouts and to maximize space utilization. (JICA, 2013).

E. Close Relationship with the supplier

Quality product, service or project needs a close relationship with parties involved in the process, including customer, employees, and supplier (Arditi and Gunaydin, 1997). The quality of the product could depend on the equipment and materials supplied by the vendors thus it is important to have a fewer dependable supplier. Selecting a high-quality supplier is important, not only it ensures on-time delivery but also prevent quality problem as some materials and parts can be the main source of quality problems (Sadikoglu et al., 2014). It is important to maintain a close and long-term cooperative relationship with suppliers as it helps to improve firms the competitiveness (Mosadeghrad, 2015). Some firms that practice TQM management require the supplier to implement TQM management or to have a certain quality program to be considered. (Burati, J. L. et al., 1992).

2.4.1. Outcomes of Total Quality Management System

Some practitioners believe TQM management could be very costly and difficult to implement; however, it has several advantages. The benefits of the total quality management system (McIntyre & Kirschenman, 2000 (cited in Hoonakker et al, 2010); Love et al., 1999) includes but not limited to: -

- Strengthened competitive position
- Higher productivity
- reduced rework, defects, and waste
- Reduced costs and better cost management
- Higher profitability
- Improved customer focus and satisfaction
- Increased customer loyalty and retention
- Improved employee morale
- Enhanced shareholder and stakeholder value
- Improved and innovative processes

2.5. TQM and Competitive advantage

In the above section, a compressive set of TQM critical success factors are reviewed in detail. In this section, a summary is given from the perspective of TQM implementation for Competitive Advantage.

Competitive advantage denotes a firm's ability to achieve market superiority or superior position over its competitors (Barney, 1991). In the long run, a sustainable competitive advantage provides above industry average performance (Sigalas & Pekka Economou, 2013).

The characteristics of competitive advantage can be looked at from market-based theory and resources based model. (porter, 1985).

Based on these theories, some of the characteristics of competitive advantage include: -

- Is driven by customer wants and needs. A company provides value to its customers that competitors do not.
- It makes a significant contribution to the success of the business.
- It matches the organization's unique resources with the opportunities in the environment.
- No two companies have the same resources; a good strategy uses them effectively.
- It is durable and lasting and difficult for competitors to copy.
- A superior research and development department, for example, can consistently develop new products or processes to remain ahead of competitors.
- It provides a basis for further improvement.
- It provides direction and motivation to the entire organization.

As each of these characteristics relates to quality, quality can be an important means of gaining a competitive advantage. Several literatures (like Seawright & Young, 1996; Powell,1995; Hewitt, 1994; Reich, 1994; and Feigenbaum, 1990) support that the practice of TQM can be used to generate competitive advantage and other literature (Flynn et al., 1995; Hendricks & Triplett, 1989; Spitzer, 1993) also argue that TQM can lead to sustainable competitive advantage. Let us see how total quality contributes to competitive advantage. Classic literature (eg. Porter, 1985, Campbell-Hunt, 2000) on competitive strategy suggests that a firm can possess' two basic types of competitive advantage: low cost and differentiation.

To achieve above average performance a cost leader firm needs to have a product with a price at or near the industry average at the same time perceived as superior or comparable to its

competitors. (porter, 1985). To achieve differentiation, a firm must be unique in its industry along with some dimensions that are widely valued by customers. (porter, 1985). To this end anything that is done to improve quality lead to better productivity that leads to lower cost. Reed et al. (1996) showed that TQM help to generate low cost or differentiation based competitive advantage. TQM help firms to attain firms' desired efficiency which leads to competitive advantage (Deming, 1982). Per Deming (1982) efficiency can be shown through cost reduction and can lead to high productivity and high capacity utilization. This means TQM is essential to achieve a low cost or differentiation based competitive advantage.

To sum up firms must understand customer needs as their success depends on customers that is why customer focus is an important success factor of TQM that lead to competitive advantage. people management is also the most important critical success factor as much of firms cost advantage comes from its very productive, motivated employees. This can drive low cost and differentiation. The other important critical success factor is top management, leadership, and commitment which helps in availing a work environment that foster cooperation, initiative, and innovation; educating and training the workforce; and enhancing the factors that affect well-being, satisfaction, and motivation that are very difficult for competitors to copy. This desired result is achieved through process management, as more efficient process, is needed when resources and activities are managed. This shall be complemented with continues improvement and close relationship with the supplier as the mutually beneficial relationship would enhance the ability of both to create value. Thus, based on the review of the literature we argue that: -

H_1: Firms with a comprehensive set of TQM practices have a better competitive advantage compared with others.

Competitive advantage is mainly measured by either by financial performance /improved revenue (Kaynak,2003); or Non-financial performance, "product quality" (Ahire and O'Shaughnessy, 1998) and customer satisfaction or improved market share (Anderson et al., 1995, Curkovic et al.,2000). For this study, a competitive advantage is measured through improved revenue (Campbell-Hunt, 2000; Reed et al., 1996). The researcher also developed some question that helps to understand firms position with respect to product differentiation and decrease in production cost.

2.6. TQM and Ownership

Duh et al (2012) studied different firm characteristics as important determinant that affects the extent of TQM implementation. Which include firm size, leverage, product diversity, and competition. The other firm characteristic that would affect TQM would be firm ownership, but very little reflection is found if it is ownership (foreign-owned or local) makes difference in practice of TQM according to D.T. Hoang et al (2010). Organizational culture or behavior is influenced by the type of firm ownership (Yavas & Rezayat, 2003; Hui, Au, & Fock, 2004). Organizational value, managers view and stakeholder management (Hockerts and Morsing, 2000) are also affected by the owner's experience and exposure in other similar firms. Studies Feng, Prajogo, Tan, and Sohal (2006) compared the experience of firms with respect to TQM and relationship quality and innovation performance; and found a significant difference of TQM implementation between Australian-owned and Singaporean-owned companies. The subject of owners influence on firm strategy and firm performance has been the interest of several studies (Anderson & Reeb, 2003; Connelly et al., 2010; Villalonga & Amit, 2006). A firm's ownership is also among firm characteristics that can affect the degree to competition and or close relationship with suppliers (Fitza, and Tihanyi,2017).

H2a: Foreign-owned construction has better a comprehensive set of TQM practices compared to locally owned construction firms.

Several studies find evidence that foreign-owned firms in developing country have significantly better performance than local-owned business (Gunduz and Tatoglu, 2003; Aydin and Sayim, 2007; Wiwatanakantag, 2001). This might be due to TQM is first developed in Japan and later adopted in the more developed foreign world. Which could mean foreign-owned firms have better exposure and understanding about TQM than locally owned firms in Ethiopia. Based on the above theoretical view we argue that differences in ownership may affect TQM practices in local and foreign-owned firms and developed the below hypothesis: -

H2b: Foreign-owned construction businesses have a better competitive advantage compared to locally owned construction firms.

2.7. Conceptual framework of the research

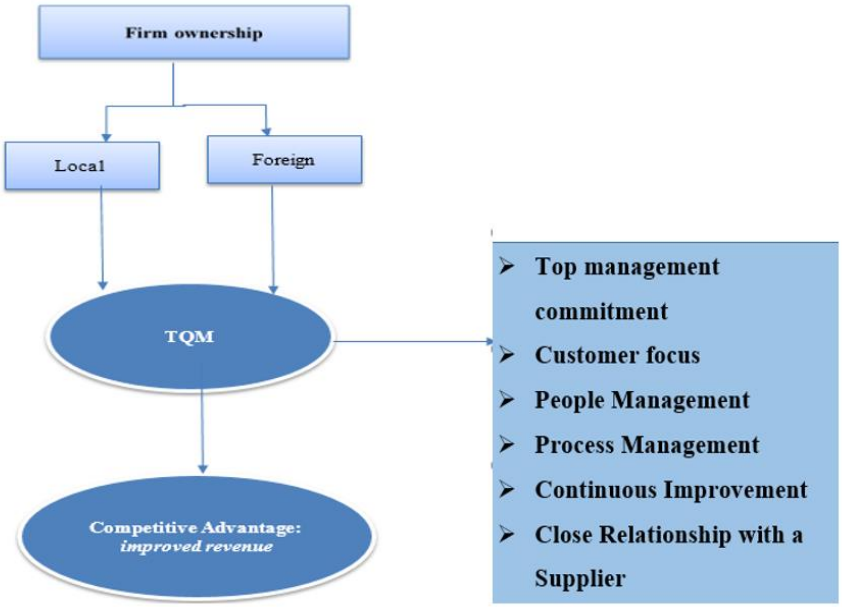
This section presents the research conceptual framework. The model shows a structural relationship among possible determinant of TQM.

After thoroughly reviewing several kinds of literature, six elements that are a critical success factor for TQM practice and implementation are identified and selected. The dependent variable is TQM practices while the independent variables are the factors influencing implementation of TQM which are: Top management commitment and leadership, customer focus, people management, process management continuous improvement and supplier management.

The study also considers firm ownership as an additional independent variable and investigate underlying factors that are likely to make ownership a determinant of TQM. This is based on Hendricks and Singha, (2001) study related to firm characteristics and TQM.

The Conceptual model establishes the structural relationships among the possible determinants of TQM (ownership), Component of TQM and competitive advantage. Accordingly, the variable relationship is shown in the figure below: -

Figure 2.1. conceptual frame work



Source: Based on literature review

Chapter 3: Research methodology

This chapter covers the research design of the study, sample and sampling techniques used, type of data collection and tools/ instruments used for data collection, procedures of the collected data, methods of data analysis, tests conducted to ensure the reliability and validity of the variables and measurement of the variables.

3.1. Research Design

The aim of the study is to identify whether ownership type (foreign or local owned) has an effect on TQM and competitive advantage in construction firms. In order to achieve the objective of the study and answer the research questions mixed methods approach is used. Mixed methods approach is the general term for when both quantitative and qualitative data collection techniques and analysis procedures are used (Saunders, Lewis & Thornhill, 2009, P.152).

For quantitative survey, descriptive and explanatory ("Descripto-explanatory") method is used. Descriptive studies are undertaken in organizations to learn about and describe the characteristics of a group of employees, as for example, the age, educational level, job status and to understand the characteristics of organizations. (Sekaran, 2003, p.121).

Descriptive design is used because the researcher addresses questions like: Which firm-type (local, foreign) have a higher competitive advantage? and Which firm-type (local, foreign) are more likely to implement TQM? As cited by, Saunders, Lewis & Thornhill, explanatory research is used to establish causal relationships between variables.

While for qualitative survey, exploratory method is used, by construing semi structured interview questions, in the study. Exploratory research, is used when detailed answer is required. (Saunders, Lewis & Thornhill, 2009, P.375).

This study is conducted by selecting 69 firms from Grade 1 construction businesses operating in Addis Ababa, Ethiopia. These sample cases are used to examine the effect of TQM on competitive advantage and the effect of ownership on TQM.

Per Ethiopia's construction firms grading and classification system, Grade 1 construction firms refers to for building contractor above 210 million for construction cost, road contractor above 300 million birr and for General contractor above 350 million birr and up to 100 million construction cost for specialized contractor. The details are presented in the table below.

Fig 3.1. Grading system for BCs, RCs and GCs construction in Ethiopia

Category system for BC, RC and GCs

Source Ministry of urban Development and Construction – directives for registration of construction professionals and contractors, June 2013

Categories	GRADE	Construction Costs (in Ethiopian Birr)		
		Building Contractors (BC)	Road Contractors (RC)	Special contractors(GC)
GC,BC,RC	1	Above 210,000,000	Above 300,000,000	Above 350,000,000
GC,BC,RC	2	Up to 210,000,000	Up to 300,000,000	Up to350,000,00
GC,BC,RC	3	Up to 160,000,000	Up to 225,000,000	Up to270,000,000
GC,BC,RC	4	Up to 110,000,000	Up to 154,000,000	Up to 185,000,000
GC,BC,RC	5	Up to 54,000,000	Up to 76,000,000	Up to100,000,000
GC,BC,RC	6	Up to 27,000,000	Up to38,000,000	Up to 45,000,00
GC,BC,RC	7	Up to 11,000,000	Up to 15, 000,000	Up to18,000,000
GC,BC,RC	8	Up to 5,400,000	Up to 7,500,000	Up to9,000,000
GC,BC,RC	9	Up to 3,000,000	Up to 4,200,000	Up to 5,000,000
GC,BC,RC	10	Up to 1,000,000	Up to1,500,000	Up to 1,800,000

GC=General Contractors: Contractors who are qualified to undertake variety of construction work such as buildings, road roads railway, bridges, airports, dams water works, etc.

BC= Building Contractors: Contractors who are qualified to undertake building construction and supplementary works on buildings.

RC= Road contractors who are qualified to undertake construction of road to other related civil engineering works.

SC= Specialized Contractors: Contractors who are qualified to undertake construction activities in specialised fields classified under the following Sub categories:

1. **Electro-Mechanical (SC-EM)**
2. **Painting and Decorations (SC-PD)**
3. **Sanitary Installation (SC-SI)**
4. **Wood and Metal Works (SC-WM)**

All selected samples are from the same sector. In addition, the researcher makes sure the selected cases are similar in nature by focusing on grade 1 general contractor operating in Addis Ababa.

Over all focusing on GC-1 not only it gives compressive view but also it enabled us to have better and easy comparability as the firms have similar range of firm characteristics and can engage in similar type of activities.

In this study quantitative type of variables has been selected, which is incorporated ordinal level of measurement is a type ordered in terms of degree or magnitude. Patel (2009). The researcher has selected 6 independent variables such as customer focus, leadership/ top management, peoples' management, process management, Continuous improvement, supplier management to be measured in Likert scale.

This research is a cross-sectional study. That is, the study observes all the businesses in the sample at the same time. This would help the researcher to compare differences across businesses. The research would have benefited from a longitudinal study because the implementation of TQM is a continuous process. The researcher was not able to conduct a longitudinal study due to time and budget limitations.

3.2. Sample and Sampling techniques

The sample of construction firms in Addis Ababa was selected using stratified random Sampling where two levels of stratification were used: firm size, and ownership. In addition, accessibility, time and budget limitation were considered as a factor while determining the geographical location.

The category General contractor with Grade 1(GC-1) is selected using stratified sampling where three levels for stratification is used: size, Equal opportunity and Firm characteristics.

The sample frame of Grade 1 General contractor (GC-1) were identified by considering the below reasons of stratification

Size - GC-1 are the biggest construction firms who can undertake a variety of construction work like building, road, bridge, dam and so on, unlike other categories of contractors. This means GC-1 firms give compressive view as they perform all kind of project compared to other categories that can only do specific project. For instance, building contractor can only take building and building related project.

Equal opportunity- According to Boere, et al (2015) foreign firms could only be grade 1 to participate in the National Competitive Bidding. Thus, by focusing on grade one we have both foreign and local firm that have similar opportunity to take the national bidding.

Firm Characteristics- The study will also focus on GC-1 as they have similar range of firm characteristics. Per ministry of urban development and construction in Ethiopia, to register and renew GC-1 license firms must fulfil the minimum required number of heavy and light duty equipment, as well as minimum number professionals with different level of education. And for GC-1 allowable construction cost is above 350,000,000 million.

Sample Size

According Ministry of Urban Development and Construction in Ethiopia, the number locally owned grade 1 contractors registered under federal, general contractors (GC-1) operating in Addis Ababa are 47. Per EIA (Ethiopian investment agency) the number of the foreign owned general contractors (GC-1) under operation are 36. From the data gathered target population of the study is 83 firms.

The sample size determination is based on Solvin's formula with confidence level 95% and confidence interval (error margin) 5%.

$$n = \frac{N}{1 + N * (e)^2}$$

Where n = no. of samples

N = total population

e = error margin / margin of error

n = $\frac{83}{1+83*(0.05)^2}$ =69

Based on Based on Slovin's formula, the sample of 69 respondents has drawn from target population of 83 firms.

In order to have proportional ownership allocation stratified sampling formula is used (Bowely,1926). The findings are summarized in the table 3.1 below:

$$n_i = n\frac{N_i}{N}$$

Where n_i - Sample size per ownership
n= Total sample size

N_i = Total population per ownership

N = Total number of firms (population of interest)

Out of the distributed 69 questioners, 51 were returned out of which 36 firms used the of TQM and while the rest 15 firms do not practice TQM.

Table 3.1. Sample size

Type of ownership	Target population	Sample size per ownership	Returned	TQM practicing	Non TQM practicing
Foreign	36	30	20	14	6
Local	47	39	31	22	9
Total Number of firms	83	69	51	36	15

These firms were contacted in person. The researcher reached out to either the CEO or top manager or project manager or other manager who is responsible quality, to respond to the survey questions.

3.3. Type of Data and tools/Instruments for Data collection

3.3.1. Instruments of data collection

Former studies including Baye and Raju R (2016), Duha et.al (2012) examine the role of TQM on performance using questionnaire to collect data. Other researchers like Abusha (2011) used questionnaire and interview as an instrument for data collection in their studies related to determinants of TQM.

By assessing all these studies and their relevance and considering similar TQM study categories in the above-mentioned, it is best to use mixed instruments like self-administered questionnaire and interview for the data collection. The primary information was collected from the selected firms using a questionnaire survey followed by in-person interview questions. The respondents are all part of the top management.

The primary data supported by secondary data collected from reports, different journals, articles and selected literature. The researcher uses secondary data sources from the Ministry of Urban Development and Construction to characterize the construction industry.

A. Questionnaire Design

A closed ended questionnaire (see Appendix A) is designed based on the literature review and research objective and distributed and collected from the chosen sample. The questionnaire contains three components: general information on the firm, features of TQM and questions measuring the competitive advantage and performance of firms.

B. Interview

Semi-structured interview questions are developed to validate the information collected through questionnaire and get additional information, which was not covered, in the questionnaire. The researcher conducts the interview with the top management. The purpose is to justify the reliability of responses collected from the questionnaire by focusing on those responses that the researcher believes needs further clarification. See appendix B for a list of all interview questions.

3.3.2. Procedures of data collection

The questionnaire is delivered in person to the top management personnel of each company. The researcher returned within two to three days of delivering the questionnaire and collected the completed survey.

On the day of collecting the survey, the researcher has conducted interview with the top management personnel's. The interview takes about 10 to 20 minutes. The researcher made notes during the interview and asked further clarifying questions. At the end of each interview, the researcher ensures that all necessary data is gathered from each firm. In addition, in person interview is performed to collect additional information and validate results and to have100% response rate.

3.4. Methods of Data analysis

Mixed method approached is used in this study, which means qualitative and quantitative approaches are used to analyse the primary data. The collected data is presented using appropriate statistics method will be outlined below. Both qualitative and quantitative analysis carried out using techniques like screening, editing and copying to show the effect of TQM on competitive advantage depends on ownership.

The study incorporates tables, graphs and figures to present data. And also uses appropriate methods to present the mean, standard deviation of data characterizing the selected sample. Correlation coefficients are calculated to understand the strength of the relationship between the data used to measure TQM and ownership, TQM and competitive advantage.

The study compares TQM implementation and competitive advantage across the two ownership types and also compares differences in the means of main variables (e.g. TQM, competitive advantage) across the two ownership types. The study incorporates casual comparative design.

In this study comparisons across firm ownership is performed in order to confirm whether both ownership types implement TQM; and whether both ownership types have the same level of firm performance or not; and to compare any differences in competitive advantage across foreign and local firms. Since the population standard deviation is not known, it is appropriate to use the *t-test* to perform mean comparison across the two ownership types.

When performing a t-test, the null hypothesis *(H_o)* states that the two means (means of variables for the two ownership types) are equal and the alternative hypothesis states that the two means are not equal. The researcher chooses a 5% significance level. The null hypothesis implies that differences in the mean between the two ownership types are purely random. These tests will be performed using SPSS software version 20.

In this study, two control variables are selected; age of the company and number of full-time permanent workers. Age of the company is reported in number of year the company was in businesses. The age of the company may influence competitive advantage and TQM. This is because more mature companies maybe more likely to have established their business than newer firms. Thus, one must control the effect of age.

The second control variable is number of full time permanent workers. This will control for firm size. firms with several full-time workers are likely to have a bigger operation which affects their profit and market share.

Regression analysis

In this research linear multiple regression analysis is preformed using SPSS version 20 software. The effect of Total quality management practice on competitive advantage is tested using the model below, where the dependent variable is competitive advantage and the main independent variable is TQM practice.

$$y_i = a_0 + a_1 x_i + a_2 z_i + a_3 OWNERSHIP_i + e_i$$

The variable y_i is a measure of competitive advantage for firm i (proxy by revenue status). The variable x_i is a measure of TQM.

TQM is measured by the several types of practices that demonstrate the availability of TQM. For example, the research incorporated Likert responses from the availability and extent of use of: top management, leadership commitment; customer focus/ customer feedback system; people management Training of employees, process management; Continuous improvement, close relationship with a supplier.

The variable z_i is a vector of firm-specific control variables such as… $OWNERSHIP_i$ is a dummy variable coded as one for locally owned firms and coded as zero for foreign owned firms. e_i stands for the error or residual. The parameter a_1 measures the effect of TQM on competitive advantage when ownership is fixed. The parameters a_3 measures the effect of ownership on competitive advantage when TQM is fixed. The parameters a_2 measures the effect of the control variables on competitive advantage where all other variables are given.

3.5. Measuring the variable

Table 3.2. variable measurement

	Independent Variable	Measures/scale	Questionnaire	Source /Adapted from
	Firm ownership (Foreign local)		Part I	
Control	Firm age	years	Part 1 Q4	
	Full time employee	number	Part I Q5	
Total Quality management (TQM)	Top management, leadership commitment	Likert scale 1=strongly disagree to 7 strongly agree	Part II- A	Kayna (2002), Saraph et al. (1989),
	Customer focus/ Customer Feedback system	Likert scale 1=strongly disagree to 7 strongly agree	Part II – B	Kayna (2002), Saraph et al. (1989),
	People management -Training of employees, Employee encouragement, Employee Satisfaction, Team work	Likert scale 1=strongly disagree to 7 strongly agree	Part II –C	Kayna,(2002), Saraph et al. (1989)
	Process management	Likert scale 1=strongly disagree to 7 strongly agree	Part II-D	*Kaynak (2002)*, Saraph et al.(1989)
	Continuous improvement	Likert scale 1=strongly disagree to 7 strongly agree	Part II – E	Kaynak (2002), Saraph et al. (1989)
	Close relationship with the Supplier	Likert scale 1=strongly disagree to 7 strongly agree	Part II -F	Kaynak (2002), Saraph et al. (1989), Dermirbag et. Al (2006), Thomas C. Powell (1995)
	Reliability- Quality	Yes 1 No 0	Interview – Quality and implementing ISO	

Dependent variable

Table 3.3. Dependent variable measurement

Variable	Measure	Survey /Interview question	Source
Competitive Advantage	Improved revenues revenue status (improving market share,or differentiation), .	Part III,(Likert scale) 1,2.3	Campbell-Hunt(2000), *Kaynak (2002),* Reed et al (1996),

3.6. Reliability and Validity

Validity is concerned with whether the findings are really about what they appear to be about. (Saunders, Lewis and Thornhill, 2009). In this study the validity was measured by wide review of literatures of the effect of TQM practices in different business served as a good baseline for selecting variables in establishing effects of TQM in the construction firms. As sited by Sekeran, 2003 Validity ensures the ability of a scale to measure the intended concept. Therefore, in this study validity is achieved in through published measurements of TQM.

Reliability refers to the extent to which the data collection techniques or analysis procedures will yield consistent findings (Saunders, et.al, 2009). As mentioned above during the data collection there were 51 responses from the total sample. In order to ensure there is a consistent findings reliability, Cronbach's Alpha test were conducted for the concerned variables on SPSS Version 20.

Table 3.4. Reliability statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.804	10

Internal consistency measures its indicative of the homogeneity of the items in the measure that tap the construct. (Sekeran, 2003). Consistency of can be examined through the inter-item consistency which uses the popular test Cronbach‘s coefficient alpha.

as sited by Namdeo and Rout (2016) the closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale using the rules of thumb if the value of alpha is >0.9 = Excellent, >0.8 =Good, >0.7 = Acceptable, >0.6 = Questionable, >0.5 =Poor, and <0.5 = Unacceptable. For this study since the all the values of Cronbach alpha for is each item is greater than 0.7 it can we said this study is reliable.

Table 3.5. Reliability analysis for every item

TQM practice	Cronbach's Alpha if Item
ownership status	.856
Age of the firm	.836
number of employee	.866
Top Management commitment	.771
Customer Focus	.777
People Management	.785
Process Management	.790
Continuous Improvement	.780
Close relationship with supplier	.784
Competitive advantage	.795
Total	.804

Source: own survey V20,2018

3.7. Ethical consideration

Concerning ethical consideration all the information and data from the respondents are confidential. The respondents are assured the confidentiality of responses by both verbally and written consent, Respondents were informed about the aim of the research clearly. Identity and other personal related information were not written on the questionnaire instead the researcher has given code to them. The responses for questionnaire are not exposed to third party but the researcher uses them only for academic purpose.

Chapter 4: Research Data Analysis and Discussion

This chapter presents the findings, analysis, interpretations and discussions of the study from the data collected. Data was collected survey questionnaire and interview. The questionnaires were given out to the 69 respondents. From the data collected 51 questionnaires were properly filled by the from the respondents.

4.1. Demographic characteristics of respondents

Demographic information of the respondents was based on gender, the position held by the respondents, year of top management experience and educational level of respondents.

Regarding gender distribution, it can be seen from the table 4.1, 70.0% of the foreign owned construction firms' respondents are male and the rest 30% are female. When it comes to the local owned construction firms 71% are male and the rest 29% are female. From this it can be inferred that majority of the top management personal in the both construction firms are dominated by male.

As it can be seen in table 4.1 below, the position held by the respondents' majority of the respondents are project managers which amounts to 70% and 58.1% of foreign owned construction and local owned construction firms respectively. In the foreign owned construction firms, the percentage for general managers, assistant managers and contract administrator is 5.0%, 20% and 5.0% respectively. While in the local owned construction firms, the percentage for general managers, assistant managers, quality head manager and contract administrator is 7.8%, respectively. 9.7%, 25.8%, 3.2% and 3.2% respectively.

Regarding the years of experience of the top/project managers, according to table 4.1 below, 95% of the foreign owned construction firm respondents have 5 years and above experience while the rest 5% have 2- 5 years' experience. While in the local owned construction firms 74.2% of the respondents have 5 years and above experience while the rest have 2 years to 5 years and 6 months to 2 years of experience which will amount to a percentage of 22.6% and 3.2 % respectively. This shows that majority of the foreign owned construction firms have much better experienced top management personnel than the local owned construction firms.

According to table 4.1 below, educational level, in the foreign owned construction firms 65.0% of the respondents are Bachelor's degree holders and the rest 35.0% are Master's degree holders. While in the local owned construction firms 12.8% of the respondents are Diploma holders while 48.4 % are bachelor degree holders and 38.7 % are master's degree holders. From this it can be inferred that foreign owned construction firms have slightly better educated top management personnel than the local owned construction firm personnel.

Table 4.1 respondents profile

Respondent Profile	Ownership status	Foreign		Local	
		Frequency	Percent	Frequency	Percent
Gender	Female	6	30.0	9	29.0
	Male	14	70.0	22	71.0
	Total	20	100	31	100.0
Position of the respondent	General manager	1	5.0	3	9.7
	Assistant manager	4	20.0	8	25.8
	Project manager	14	70.0	18	58.1
	Quality head manager	0	0	1	3.2
	Contract administrator	1	5.0	1	3.2
	Total	20	100.0	31	100.0
Year of Experience	Less than 6 months	0	0	0	0
	6 months to 2 years	0	0	1	3.2
	2 years to 5 years	1	5.0	7	22.6
	5 years and above	19	95.0	23	74.2
	Total	20	100.0	31	100.0
Educational level	High school	0	0	0	0
	Diploma	0	0	4	12.9
	Bachelor's degree	13	65.0	15	48.4
	Master's degree	7	35.0	12	38.7
	Above Master's degree	0	0	0	0
	Total	20	100.0	31	100.0

Source, own survey, 2018

4.2. Background information about the firm

Background information of the construction firms is based on ownership status, percentage of ownership, nationality and age of the firm. It also has the number of employee when the firm begun operation, the current number of employee, the number of full time employee at Top management level. It also contains information on firms' website usage, internet usage and firm familiarization with technology, process and marketing practice.

Table 4.2 Ownership of the firms

		Frequency	Percent
Ownership status	Foreign	20	39.2
	Local	31	60.8
	Total	51	100

Source, Own survey 2018

According to table 4.2 above, the ownership status of the construction firms, 60.8 % of the respondents are locally owned construction firms while the rest 39.2% were foreign owned construction firms. This implies that majority of the respondents are locally owned construction firms.

Table 4.3 Firm characteristics

Items		Foreign		Local	
		Frequency	Percent	Frequency	Percent
Percentage of ownership	Foreign 100%	20	100	0	0
	Local 100%	0	0	31	100
	Total	20	100	31	100
Nationality	Chinese	14	70.0	0	0
	Italian	3	15.0	0	0
	Greek	1	5.0	0	0
	Saud Arabia	2	10.0	0	0
	Ethiopian	0	0	31	100
	Total	20	100	31	100
Firm Age	< 1969	1	5.0	0	0
	1969 – 1984	3	15.0	10	32.3
	1985 - 2002	0	0	15	48.4
	2003 - 2018	16	80.0	6	19.4
	Total	20	100.0	31	100.0
No employees when the firm begun	10-25	15	75.0	24	77.4
	26-40	0	0	4	12.9
	41-55	1	5.0	0	0
	>56	4	20.0	3	9.7
	Total	20	100.0	31	100.0
Current number of employees	<100	11	55.0	16	51.6
	101-500	7	35.0	10	32.3
	501-1000	2	10.0	3	9.7
	>1000	0	0	2	6.5
	Total	20	100.0	31	100.0
Full time top management employee	<10	6	30.0	6	19.4
	10-15	8	40.0	16	51.6
	16-20	2	10.0	5	16.1
	>20	4	20.0	4	12.9
	Total	20	100.0	31	100.0
Website usage/ online presence	yes	13	65.0	22	71.0
	No	7	35.0	9	29.0
	Total	20	100.0	31	100.0
Communication with internet services	yes	18	90.0	26	83.9
	No	2	10.0	5	16.1
	Total	20	100.0	31	100.0
Updating employee with new technology, process and marketing practices	yes	19	95.0	19	61.3
	No	1	5.0	12	38.7
	Total	20	100.0	31	100.0
TQM Practices	yes	14	70.0	22	71.0
	no	6	30.0	9	29.0
	Total	20	100.0	31	100.0

Source, own survey, 2018

According table 4.3, the percentage of ownership, 100 % of the respondents have sole ownership in both foreign and local owned construction firms.

In this research the control variables are firm age and number of employees were selected in order to evaluate the firms completive advantage and to better interpret the application of TQM in the perspective local and foreign owned construction firms.

Regarding the nationality of the owners, table 4.3 above shows, all the local owned construction firms' respondents are 100 % Ethiopian. While in the foreign owned construction firms' respondents,70% are Chinese, 15% are Italian, 5% are Greek owners and 10 % are Saudi Arabian owners. This implies majority of the owners in foreign owned construction firms are Chinese nationals.

With respect to the age of the firm of respondents, in the foreign owned construction firms, 80.0% of them fall between the years of 2003 - 2018, 15.0% are established in the years between 1985 – 2002 and the rest 5.0% the respondents were established before the year 1969. While in the local owned construction firms, 19.4% were established between the years of 2003 - 2018, 48.4% were established in the years between 1985 – 2002 and 32.3% of all within the years of 1969 – 1984, This indicates that majority of the foreign owned firms were established more recently compare to the local owned construction firms.

According table 4.3, the number of employee working at the firm when the firms begun operation, in the foreign owned construction firms' 75% of the respondents had 10-25 employees, 20.0% of the respondents started with more than 56 and rest 5% of the respondents had 41-55 employees. While in the local owned construction firms' respondents has 77.4% of the respondents falls between 10-25, 12.9% of the respondents falls within the range 26-40 and 9.7% of the respondents are greater than 56. This indicates that both of the firms begun their operation with a small number of employees.

Regarding the current permanent number of employee, in the foreign owned construction firms, 55% of the respondents have less than 100 employees, 35% of the respondent have employee with the range of 101-500, 10% of the respondents' employees are within a group of 501 and 1000 and only 3.9% of the respondents have more than 1000 employees. In the local owned construction firms 51.6% of the respondents have less than 100 employees, 32.3% of the respondent are between 101 and 500 while 9.7%, 6.5% of the respondents' have employees between 501 and 1000 and more than 1000 employees respectively. This implies majority of the respondents in both constructions firms current have suitable amount of current permanent employees.

From table 4.3 above, the number of employee working in the top management area of the firm, 30% of the foreign owned construction firms respondents have less than 10 employees while 40%, 20%,10% of the respondents have between 10 and 15, between 16 and 20, and greater than 20 employees respectively. While 51.6% of the local owned construction firms respondents have 10-15 employees working in the top management area of the firm while 19.4%, 16.1%,12.9% of the respondents have less than 10, between 10 and 15 employees and greater than 20 employees respectively. This indicates that there are sensible amount of man power working in the top management area working in both firms.

Communication of strategies of the firms

When it comes to, firm websites usage, in table 4.4 below, 65% of the foreign owned construction firms respondents and 71% of local owned construction firms respondents actively uses websites to advertise their firm while the rest 35% of the foreign and 29 % of the local owned construction firms respondents don't use websites. From this it can be concluded both of the firms have active online presence.

According to table 4.4 below, it can be seen that 90% of the foreign owned construction firms and 83.9% of the local owned construction firms respondents actively uses internet services such as email and websites in order to communicate with customers or suppliers while the rest 10% of the foreign and 16.1% of the local owned construction firms respondents do not use internet services for in order to communicate with. From this it can be inferred that the foreign owned firms have slightly better active online communication system with their customers and suppliers than the local owned firms.

From table 4.4, Updating/ familiarizing employee with new technology, process and marketing practices, 95% of the foreign respondents and 61.3% of the local respondents are familiar with new technology while only 5% of foreign and 38.7% of the local respondents does not familiarize themselves with a new technology. This implies the foreign owned construction firms employees are more familiar with new technology, process and marketing practices than the local owned construction firms.

When it comes to TQM practices, in table 4.4, 71% of the respondents of the foreign owned construction firms and 70% of the local owned construction firms practice TQM. While 30% of the foreign and 29% of local construction firm respondents don't practice TQM. This implies majority of the respondents in both firms practice TQM.

Table 4.4. communication strategies of the firm

Items		Foreign		Local	
		Frequency	Percent	Frequency	Percent
Website usage/ online presence	yes	13	65.0	22	71.0
	No	7	35.0	9	29.0
	Total	20	100.0	31	100.0
Communication with internet services	yes	18	90.0	26	83.9
	No	2	10.0	5	16.1
	Total	20	100.0	31	100.0
Updating employee with new technology, process and marketing practices	yes	19	95.0	19	61.3
	No	1	5.0	12	38.7
	Total	20	100.0	31	100.0
TQM Practices	yes	14	70.0	22	71.0
	no	6	30.0	9	29.0
	Total	20	100.0	31	100.0

Source own survey 2018

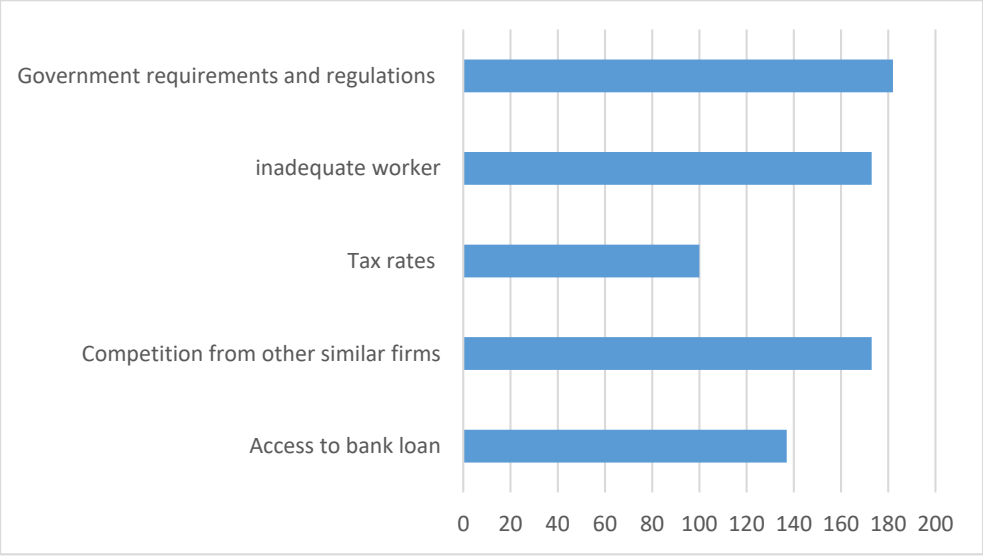
Firm constraints

From the table 4.5 and fig 4.1, it can be seen that the major constraint faced by the construction firms in this study is government requirement and regulations, which is followed by inadequate workers and competition from other similar firms. While access to bank loan and tax rates are the least constraints. As discussed in literature review, this constraint is some of the challenges that might impact the implementation of TQM.

Table 4.5. order of firm constraint

Constraints	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Total	Rank order
Access to bank loan	12	7	5	7	20	137	4
Competition from other similar firms	12	10	16	12	1	173	2
Tax rates	1	4	8	17	21	100	5
inadequate worker	10	15	15	7	4	173	2
Government requirements and regulations	16	15	7	8	5	182	1

Fig.4.1, Graphical representation of firm constraints



4.3. Descriptive analysis for Competitive advantage

In this section the competitive advantage of both of the firms is described below.

From table 4.6 below it can be seen that the number of direct competitors of the firm with in the past 12 months, 100% of the foreign owned respondents competes with less than thirty firms. 77.4% the local firms compete with less than thirty firms while 12.9% and 9.7% of the respondents are between 61 and 90 firms and between 31 and 60 respondents have more than sixty competitors. This indicates the foreign owned construction firms have less direct competitors than the local firms.

Regarding the revenue status of the firms, table 4.6 shows, 45% of the foreign and 32.3% of the local owned firms' respondents had increase in revenue, 15% of the foreign and 12.9% of the local firms respondents has a significance increase in there revenue with in the past year. while 15% foreign and 19.4% of the local owned respondents had decrease in revenue. And the rest of 20% foreign and 35.5% of the local owned revenues status stayed about the same. This shows the foreign owned firms have better revenue status than the local owned construction firms.

Table 4.6, descriptive analysis for competitive advantage

		Foreign		Local	
		Frequency	Percent	Frequency	Percent
No of competitors	<30	20	100	24	77.4
	31-60	0	0	3	9.7
	61-90	0	0	4	12.9
	Total	20	100	31	100.0
Revenue status	Significantly decrease	1	5.0	0	0
	Decreased	3	15.0	6	19.4
	Stayed about same	4	20.0	11	35.5
	Increased	9	45.0	10	32.3
	Significant increased	3	15.0	4	12.9
	Total	20	100.0	31	100.0

Source own survey 2018

TQM and competitive advantage

Regarding the firms competitive advantage while practicing TQM, both the foreign and local owned construction firms stated the first thing that differs them from their competitor's quality Second is offering unique and different projects to their customers, thirdly their project is completed and delivered in timely manner compared to their competitors. Some of the foreign firms stated that they are very successful practicing TQM gave them an advantage to increases their revenue with the past fiscal year.

4.4. Correlation Analysis

Correlation measures both the strength and the direction of the relationship between a pair of variables. (Bryman and Cramer, 1999).

Table 4.7. correlation analysis

Correlations											
		Years	No_EM	TMC	CF	PM	PRM	CI	CRS	O_S	CA
Years	Pearson Correlation	1	-.351*	.224	.334*	.126	.035	.377*	.071	-.207	.439**
	Sig. (2-tailed)		.012	.188	.047	.466	.840	.023	.680	.146	.001
No_EM	Pearson Correlation		1	-.026	-.374*	-.026	.087	-.119	-.125	.096	-.121
	Sig. (2-tailed)			.880	.025	.879	.613	.489	.468	.503	.399
TMC	Pearson Correlation			1	.622**	.711**	.820**	.759**	.735**	-.370*	.385*
	Sig. (2-tailed)				.000	.000	.000	.000	.000	.026	.020
CF	Pearson Correlation				1	.733**	.461**	.714**	.689**	-.220	.766**
	Sig. (2-tailed)					.000	.005	.000	.000	.197	.000
PM	Pearson Correlation					1	.558**	.564**	.537**	-.210	.436**
	Sig. (2-tailed)						.000	.000	.001	.219	.008
PRM	Pearson Correlation						1	.607**	.765**	-.417*	.298
	Sig. (2-tailed)							.000	.000	.011	.077
CI	Pearson Correlation							1	.691**	-.515**	.605**
	Sig. (2-tailed)								.000	.001	.000
CRS	Pearson Correlation								1	-.249	.583**
	Sig. (2-tailed)									.142	.000

O_S	Pearson Correlation									1	-.199
	Sig. (2-tailed)										.162
CA	Pearson Correlation										1
	Sig. (2-tailed)										
*. Correlation is significant at the 0.05 level (2-tailed).											
**. Correlation is significant at the 0.01 level (2-tailed).											

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA), ownership status (O_S)

As sited by Patel. (2009) the range of correlation is more likely to have a stronger the relationship between the variables is a correlation close to -1 or 1 the. A correlation of 0.01 to 0.3 indicates a weak positive relationship, while a correlation of -0.01 to -.3 indicates a weak negative relationship. A correlation of 0.31 to 0.69 indicates a moderate positive relationship while a correlation of -0.31 to -0.69 indicates a moderate negative relationship. A correlation above 0.7 indicates a strong positive, and a correlation below -0.7 indicates a strong negative relationship.

The researcher has used the above range in order to established relationship with the perspective variables. As shown in the table above competitive advantage has strong and moderate relationship with most of TQM predicators.

In the correlation analysis shown in table 4.7, the correlation coefficients for relations among all the variables, control variable, independent variable and dependent variables is explicitly shown. The two of the control variables, age of the firm and number of permanent employee related with completive advantage has moderately positive (r= 0.49, P=0.02) and week negative relationship respectively. Based on the results it can be concluded the association is weak and it's statically not significant from this it can be inferred that control variables are not strong enough predicator for completive advantage of the firm. when we consider the correlation between ownership status an independent variable and TQM practices all the variables have negative correlation coefficient therefore it can be concluded that there is no statically significant.

When we look at the dependent variable competitive advantage has strong and moderate correlation with Customer focus (r=.766, P<0.01), continuous improvement (r=.605, P<0.01), and close relationship with supplier (r=.583, P<0.01), These three independent variables have a positive and significant relation with the dependent variable competitive advantage, therefore the increase in Customer focus, continuous improvement and close relationship with suppliers, increases the firms completive advantage.

When it comes to the other independent variables correlation coefficient association with the dependent variable is not statically significant, Top management commitment (r=.85, P<0.01), Process Management (r=.498, P<0.01), People Management (r=.436, P<0.01). therefore, the researcher will perform a regression analysis in order to conduct a conclusive and statically significant out come on whether there is an effect of TQM on completive advantage and ownership in the construction firms.

4.5. Regression analysis diagnostics

4.5.1. Autocorrelation

The researcher also conducted autocorrelation test in order to make sure the regression results are feasible. (Saunders, Lewis and Thornhill, 2009) proposes autocorrelation is important because the results of regression analysis are less likely to be reliable. Auto correlation is measured using the Durbin-Watson statistic ranges in value from zero to four. A value of two indicates no autocorrelation. A value towards zero indicates positive autocorrelation. Conversely, a value towards four indicates negative autocorrelation.

Table 4.8. auto correlation model summary

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.921	.848	.796	.458	1.919
a. Predictors: (Constant), CRS, PM, CI, PRM, CF, TMC, Age of the firm, Number of employee and ownership status					
b. Dependent Variable: CA					

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS),

From table 4.8, it can be seen that the value of Durbin Watson equal to 1.92, since the result lies within the suggested number 2. From this it can be inferred that there is no autocorrelation.

4.5.2. Hypothesis testing

In this section the researcher describes the tests conducted in order to prove the hypothesis proposed for the study. The hypothesis will be tested using liner multiple regression analysis which is a method that determines the effect of the dependent variables on independent variables.

H1: Firms with a comprehensive set of TQM practices have a better competitive advantage compared with others.

This test tries to establishes whether there is a positive and significant relationship between competitive advantage and TQM practices. In order to test this hypothesis two model analysis were made, in the first model control variables are included in the analysis while in the second model is tested without the control variables.

Table 4.9 regression model1: statistics with control variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.921[a]	.848	.796	.458	.848	16.132	.000

a. Predictors: (Constant), Age of the firm , number of employee, CRS, , PM, CI, PRM, CF, TMC, ownership status

b. Dependent Variable: CA

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA)

As shown in the table 4.9, model one shows the summarized relationship of all the variable, control variables, independent and dependent variables. When we interpret the results R equals to 0.921 shows that it has a strong and significant relationship between competitive advantage and all the variables proposed. From table, R square equals to 0.848 which means that firms with

comprehensive set of TQM practices have better significant relationship. To make sure the analysis is appropriate F change is tested in the table below. F test is conducted when one needs to prove there a positive and significant relationship between the dependent and independent variables.

Table 4.10. regression analysis coefficients with control variables

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.709	.790		-2.164	.040
	ownership status	.192	.214	.094	.894	.380
	Age of the firm	.555	.112	.493	4.937	.000
	number of employee	.458	.117	.410	3.927	.001
	TMC	-.358	.165	-.414	-2.170	.039
	CF	.711	.161	.828	4.408	.000
	PM	-.116	.119	-.146	-.974	.339
	PRM	-.027	.156	-.030	-.174	.863
	CI	.045	.175	.044	.257	.799
	CRS	.475	.185	.428	2.568	.016
a. Dependent Variable: CA						

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA)

From table 4.10, above coefficient table, we can see there is positive and significance relationship found starting from the control variables considered age of the firm (β = .555, P= .000) and number of employee (β = .458, P= .001) then when it comes to the independent variables, Customer focus (β =0.711, P= .000).

Table 4.11. ANOVA test table with control variables

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.409	9	3.379	16.132	.000[b]
	Residual	5.446	26	.209		
	Total	35.854	35			

a. Dependent Variable: CA

b. Predictors: (Constant), CRS, Age of the firm , number of employee, PM, CI, PRM, CF, TMC

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA)

From table 4.11, it can be seen that ANOVA (F- test) shows the result of $F_{(9,26)} = 16.132$, P = 0.00, this can be used to interpret the relationship between TQM practices and competitive advantage while the other variables are controlled the results of (F>1, P<0.01) indicates the hypothesis proposed that *firms with a comprehensive set of TQM practices have a better competitive advantage compared with others is accepted.*

Table 4.12 regression model 2 statistics

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
2	.813[a]	.661	.591	.647	.661	9.420	.000

a. Predictors: (Constant), CRS, PM, CI, PRM, CF, TMC

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA).

As shown in the table 4.12, model two shows the summarized relationship between independent and dependent variables. When we interpret the results R equals to 0.813 shows that it has a strong and significant relationship between competitive advantage and all the variables proposed. From table, R square equals to 0.661 which means that firms with comprehensive set of TQM practices have better significant relationship. To make sure the analysis is appropriate F change is tested in

the table below. F test is conducted when one needs to prove there a positive and significant relationship between the dependent and independent variables.

Table 4.13. regression analysis of coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.053	.764		1.379	.178
	TMC	-.257	.224	-.297	-1.149	.260
	CF	.711	.192	.716	3.207	.003
	PM	-.093	.156	-.117	-.595	.556
	PRM	-.058	.202	-.065	-.287	.776
	CI	.263	.202	.256	1.303	.203
	CRS	.271	.243	.243	1.115	.274
a. Dependent Variable: CA						

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA)

From table 4.13, above coefficient table, it can be seen that only the independent variable, customer focus (β =0.615, P= .003), has positive and significance relationship the independent variables.

Table 4.14. ANOVA test table for main variables

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	23.696	6	3.949	9.420	.000[b]
	Residual	12.158	29	.419		
	Total	35.854	35			

a. Dependent Variable: CA

b. Predictors: (Constant), CRS, PM, CI, PRM, CF, TMC

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS), Competitive advantage (CA)

From table 4.14, it can be seen that ANOVA (F- test) shows the result of $F_{(6,29)} = 9.420$, $P = 0.00$, this can be used to interpret the relationship between TQM practices and competitive advantage without including a control variable the results of ($F>1$, $P<0.01$). Since the tests conducted for both regression models show more or less similar results it can be indicated that the hypothesis proposed that *firms with a comprehensive set of TQM practices have a better competitive advantage compared with others is accepted.*

H2a: Foreign-owned construction have a better comprehensive set of TQM practices compared to locally owned construction firms.

In order to test this hypothesis, the researcher used independent sample T-test for comparison of means. Table 4.15 shows the variables used in testing the Comprehensive TQM practices across foreign and local owned construction firms. From the Table 4.16, the average mean performance of foreign owned construction firms exceeds that of local construction firms on the following variables used.

Table 4.15 Descriptive statistics for TQM practices

Descriptive Statistics				
Variables	Foreign		Local	
	Mean	Std. Deviation	Mean	Std. Deviation
Top Management Commitment	6.18	.790	5.30	1.260
Customer Focus	5.78	1.461	5.25	.941
People Management	5.62	1.347	5.08	1.197
Process Management	6.43	.703	5.48	1.202
Continuous Improvement	6.24	.690	5.22	.942
Close relationship with supplier	6.10	.819	5.64	.938

Source: own survey, SPSS V20, 2018

From Table 4.16. It can be seen that there is a significant difference between TQM practices of Foreign-owned construction firms and locally owned construction firms. The significance level values for levene's test are, 0.073 for Top management commitment, 0.125 for customer focus,

0.199 for people management, 0.169 for Process management,0.045 for continuous improvement and 0.750 for Close relationship with a customer. except for continuous improvement Most of the significance values are greater than the standard value which amounts 0.05 therefore the result is not significant. When we look at the all the values of sig (2-failed) greater than 0.05 as well, therefore a significant difference between the two the foreign and local owned construction firms therefore the null hypothesis rejected and the alternate hypothesis therefore *the hypothesis that Foreign-owned construction have a better comprehensive set of TQM practices compared to locally owned construction firms is accepted*.

Table 4.16 Test of hypothesis for TQM practices

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
TMC	Equal variances assumed	3.434	.073	2.324	34	.026	.877	.377	.110	1.645
	Equal variances not assumed			2.568	34.000	.015	.877	.342	.183	1.572
CF	Equal variances assumed	2.468	.125	1.316	34	.197	.525	.399	-.286	1.336
	Equal variances not assumed			1.196	19.910	.246	.525	.439	-.391	1.441
PM	Equal variances assumed	1.714	.199	1.253	34	.219	.538	.430	-.335	1.411
	Equal variances not assumed			1.219	25.381	.234	.538	.441	-.370	1.447

PRM	Equal variances assumed	1.972	.169	2.675	34	.011	.951	.356	.229	1.674
	Equal variances not assumed			2.993	33.846	.005	.951	.318	.305	1.597
CI	Equal variances assumed	4.332	.045	3.506	34	.001	1.024	.292	.430	1.618
	Equal variances not assumed			3.757	33.216	.001	1.024	.273	.470	1.579
CRS	Equal variances assumed	.104	.750	1.502	34	.142	.459	.306	-.162	1.081
	Equal variances not assumed			1.549	30.584	.132	.459	.296	-.146	1.064

Source, own survey, SPSS V20, 2018: Key, Top management commitment(TMC), Customer Focus (CF), Process management (PRM) Peoples management(PM), Continuous Improvement (CI), Close relationship with customers (CRS),

H2b: Foreign-owned construction firm have a better competitive advantage compared to locally owned construction firms.

From table 4.17 shows all the variables considered in order to test the level of competitive advantage between foreign and local owned construction firms, the average mean performance of foreign owned construction firms exceeds that of local construction firms on all the variables used.

Table 4. 17, Descriptive statics for competitive advantage

Descriptive Statistics

	ownership status	N	Mean	Std. Deviation	Std. Error Mean
Competitive advantage	foreign	20	5.37	1.201	.269
	local	31	4.95	.911	.164

Own survey, SPSS V20, 2018

From Table 4.18. Below It can be seen that the significance level for levene's test are, 0.74 for competitive advantage. All of the considered variables have significance values are greater than the standard value which amounts 0.05 therefore the result is not significant. When we look at the all the values of sig (2-failed) they are greater than 0.05 as well, therefore a significant difference between the two ownership types therefore the null hypothesis rejected and the alternate hypothesis *that states Foreign-owned construction have a better competitive advantage compared to locally owned construction firms is accepted*.

Table 4.19, Test of hypothesis for competitive advantage

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Revenue status	Equal variances assumed	.091	.764	1.199	49	.236	.510	.425	-.344	1.364
	Equal variances not assumed			1.213	42.171	.232	.510	.420	-.339	1.358

Source, own survey, SPSS V20, 2018:

Table 4.19. Summary of hypothesis Tests

	Hypothesis testing	Results
1	H1: Firms with a comprehensive set of TQM practices have a better competitive advantage compared with others	Accept
2	H2a: Foreign-owned construction have better a comprehensive set of TQM practices compared to locally owned construction firms	Accept
3	H2b: Foreign-owned construction businesses have a better competitive advantage compared to locally owned construction firms	Accept

4.6. Analyses of Data Gathered from Interview

The respondents of the interview questions were a project manager, quality assurance head, contract administrator head, and general manager of both local and foreign-owned construction firm.

Profit increase and Market share of construction firms

Regarding the profit of construction firms, the majority of the foreign-owned construction firm respondents stated they have significant increase that ranges from 10-25 % of profit the past year because they deliver their projects on time and with quality. While the locally owned construction firms reported 4 - 8% profit. Regarding the market share of both foreign and local firms' respondents stated it's usually not known because they use tender bid and their perspective competitors changes per project.

Firm's performance with respect to the closest (or major) competitor

According to the local firms' personnel, the firm's performance against their major competitors is at high capacity, deliver their projects on time and excellent quality. While the foreign firm's personnel suggested their firm's performance it very high because they use new type construction technology.

Major challenges the firm faced while practicing TQM or if the firm is not practicing TQM

According to the data gathered the challenges faced by the locally owned firm's while implementing TQM in their construction firms are caused due to lack of top management commitment, an inadequacy of employees to compute task, accessing bank loans and lack of educated manpower. the local owned firms also face a huge challenge from competitors like Chinese construction firms. The challenges faced by foreign firms while practicing TQM are working with local standards (government requirement and regulation) and personnel's due to language and different business culture, lack of skilled labourers (inadequate workers) for specialist work is high rise buildings.

when it comes to the firms that do not practice TQM, both the local and foreign, the main challenge is lack of awareness of the concept, educated manpower, misconception of benefits TQM and the belief that the practices of TQM comes at very high cost and therefore the firms are highly reluctant to the practice TQM.

❖ **Mechanisms to measure firms effectiveness**

When it comes to effectively practicing TQM in local firms, most of the top management personnel stated that it moderately effective by adopting different approaches including training awareness, kaizen, continuous improvement techniques; PDCA (plan, do check and act) cycle commitment. Regarding the mechanics where local firm's management personnel stated they measure the effectiveness of TQM practice by performing QMS audit, monthly and annual evaluations. The local construction firm's management personnel stated that TQM practice implementation helps to identify the gaps with the company, this could be achieved by consecutively recording performance of the employees then revealing the results to them and discuss how to solve each problem.

In the foreign firms, the practice of TQM is very effective, they measure their effectiveness by conducting monthly evaluation TQM departments from their firm's headquarter, working with local standard and personnel, time, cost, Quality, and projection.

❖ **TQM practices used in the firm in order to improve in both firm's effectiveness include:**

- Continuous assessment based on its ISO standard 9001
- Employing a PDCA system (Plan- Do- Check-Act)
- Performing quality works within a short period of time, Goal setting
- Strongly working on improving skill and capacity of an employee
- Strategic and systematic approach formulation of internal quality assessments

❖ **Standard certification**

When it comes to standardization the local owned construction firms that practices TQM, most of them were certified ISO:9001 in the past five years. While the rest is working towards becoming certified, considering most construction companies started applying TQM practices within recent years it can be said most firms are on the right track. The top management personnel has stated that using standardized methods has helped their company to increase firms' quality of work. In foreign-owned firms, only a few are ISO certified most of the firms uses their own type of quality management system within their perspective countries standard.

❖ **Suggestion of TQM implementation and improvement for firms' effectiveness**

Regarding the implementation of TQM and improvement of the firm's effectiveness and competitive advantage, many suggestions were made by both the local and foreign-owned construction management personnel which includes,

- Improve top management commitment in the firm.
- Proper employees training should be conducted.
- Allocation of proper resources towards the application of TQM.
- Make TQM practices as standard rule/ or part of the organizational culture for grade one construction firms.
- Properly implementing TQM practices such as developing good customer feedback system using technology (proper comment section designed in their websites).
- The concept of TQM awareness in the construction sector should be created in a national capacity, by the proper organization like construction and urban minister or quality standard organization.

Chapter 5: Summary conclusion and recommendation

This chapter presented the summary of findings, conclusions, and recommendations obtained from the findings of the study.

5.1. Summary of Findings

This study the effect of Total quality management on competitive advantage and ownership in the case of construction companies were analyzed. This analysis was made from the data collected from randomly selected grade one construction firms in Addis Ababa. all the variables included in this research are adopted from reviewed literature. Based on the result of the descriptive analysis, correlation analysis, regression analysis, independent T-test and interview the following summaries were made.

Based on the result of the descriptive analysis the results, in the demographic analysis of both firms, most of the respondents of the top management are male, have the position of project manager, are a holder of bachelor's degree and above and are very well experienced. When it comes to background information of the firms, 60.8% of the respondents are locally owned, the percentage of ownership for both the locally owned and the foreign-owned construction firms has 100 % sole ownership with their category. Majority of the foreign-owned respondent are Chinese nationals. Both firms began their operation with a small number of employees.

Foreign-owned firms were established more recently compare to the local owned construction firms. Both firms begun their operation with a small number of employees and currently have a suitable amount of permanent employees and here is a sensible amount of manpower working in the top management are working in both firms.

Foreign-owned firms have slightly better active online communication system with their customers and suppliers than the local owned firms. the foreign-owned construction firms' employees are more familiar with new technology, process, and marketing practices than the local owned construction firms.

More than 70% of the respondents of both foreign-owned and locally owned Grade 1 construction firms apply the practice of TQM. One of the other observation made in the descriptive analysis is on the constraint of the firm, the first major constraint is Government requirement and regulation second is competition with other firms and inadequate workers, the third largest constraint is access

to Bank loan, the final and least constraint faced by the firms is tax rates. When it comes to competitive advantage analysis most firms had an increase in their revenue status. From the analysis, foreign-owned construction firms have less direct competitors than the local firms. foreign-owned firms have better revenue status than the local construction firms, therefore, indicating the foreign-owned are more profitable than the local owned construction firms.

The correlation analysis was made by for control, independent and dependent variables. The correlation coefficient r ranges from 0.766 to 4.36 this indicates that there is a moderately strong association between competitive advantage and TQM practices.

In order to test Hypothesis 1 linear multiple regression analysis was conducted the overall model summary shows the relationship of all the variable, control variables, independent and dependent variables. When we interpret the results R = 0.918 shows that it has a strong and significant relationship between competitive advantage and all the variables proposed. R= 0.843 which means that firms with a comprehensive set of TQM practices have a better significant relationship. The coefficients variables show positive and significance relationship, starting from the control variables considered age of the firm (β = .555, P= .000) and number of employee (β = .458, P= .001) then when it comes to the independent variables, Customer focus (β =0.711, P= .000). To make sure the analysis is appropriate F change was tested using ANOVA shows the result of F (9,26) = 16.132, P = 0.00, this can be used to interpret the relationship between TQM practices and competitive advantage while the other variables are controlled by the results of ($F>1$, $P<0.01$) indicates that firms with a comprehensive set of TQM practices have a better competitive advantage compared with others.

The second and third hypotheses were tested using independent sample T-test. Mean comparison it was made and found that the foreign-owned firms have exceeding results than the local ones when it comes to the second hypothesis it was found that a significant difference between TQM practices of Foreign-owned construction firms and locally owned construction firms. The significance level values for Levene's test are 0.073 for Top management commitment, 0.125 for customer focus, 0.199 for people management, 0.169, Process management 0.045 and 0.750 for the Close relationship with a customer. except for continuous improvement. Most of the significance values are greater than the standard value which amounts 0.05, therefore, the result is not statically significant. Therefore, the null hypothesis is rejected and the alternate hypotheses

Foreign-owned construction have a better comprehensive set of TQM practices compared to locally owned construction firms is accepted.

in the third hypothesis, there were was some significant difference, some the significance level for Levene's test is 0.74 for revenue status. The significance value is greater than the standard value which amounts 0.05, therefore, the result is not significant, therefore rejects the null hypothesis and accepts the hypothesis that Foreign-owned construction has a better competitive advantage compared to locally owned construction firms.

5.2. Conclusion

The aim of this study was to determine the effect of TQM practices on competitive advantage and ownership in construction firms in Ethiopia. The study was mainly focused on grade 1 general contractors and outlined five objectives. Based on the findings of the study the following conclusions are drawn.

When it comes to the extent of the practice of TQM in the construction sector of Ethiopia, it can be concluded from this study result that most grade one general contractor construction firms use TQM practices.

From the regression analysis made it is implicated that the two control variables, the age of the firm and number of employee respectively have a strong and moderate effect on the firms TQM practices and competitive advantage. The linear multiple regression also shows that the independent variables such as customer focus have a strong impact in the firm from TQM practices.

This means the firm provides excellent service by determining and incorporating customer needs, 95% of the time customer expectation is met or exceeded, there a good customer feedback system (customer satisfaction is measured and recorded on a regular basis), maintains close contact with their customer by using email, phone, website or any social media. It also means that the firm highly encourages customers are to give their feedback on quality in every phase and delivery of the projects, addresses customer complaints timely manner and recorded for future reference and provides all its employees with customer focus training gives the firm great competitive advantage, which means firms have revenue increases, cost minimization strategy to lower price than their competitor, better quality, offers unique and differentiated projects to their customers compared and projects are completed and delivered in a timely manner compared to their competitors, Our firm is usually involved in submitting competitive tenders to win contracts.

From the T-test analysis made it's implicated that foreign-owned construction firms have a better comprehensive set of TQM practice than the local owned construction firms. It's also was proved that the foreign-owned construction firms have a better competitive advantage than the local firms. Even though foreign-owned construction firms were established recently than the local owned firms, the foreign-owned firms have a better competitive advantage because they use of technology

to update their employees and communicate with their suppliers and advertise their firm's services. This is an implication that the foreign firms have the non-financial competitive advantage than the local ones.

Based on the brief interview conducted with some of the firms, it can be concluded as follows

- Foreign-owned construction firms face different challenges while practicing TQM, inadequate workers, and government requirement and regulations.
- Local owned construction firms face many challenges while implementing TQM in their construction firms are caused due to lack of top management commitment, accessing loans from banks and competition from other firms.
- Foreign-owned construction firms have slightly better profit than the local firms.
- Both locally owned and foreign-owned construction firms suffer from lack of awareness or knowledge regarding TQM practices.
- Both locally owned construction firms and foreign-owned construction firms use ISO certification standards but when it comes to the foreign-owned construction firms only a few uses ISO certification standard, most follow by their counties national standards and certification.
- Local owned construction firms implement kaizen strategy of continuous improvement; PDCA (plan, do check and act) cycle in order to improve firms effectiveness.
- Local owned construction firms measure the effectiveness of TQM practice by performing QMS audit, monthly and annual evaluations.
- Foreign-owned construction firms measure their effectiveness by conducting monthly evaluation TQM departments from their firms headquarter.
- Both locally and foreign made suggestions that in order to effectively implement TQM in the construction firms should give proper training to their employees, improve their top management commitment, proper resources should be allocated for TQM practices.

From the findings of this study, it can be concluded that construction industries can benefit from TQM practice. This research supports the conclusion of a prior study made by Pheng and Teo 2004, TQM practices necessary for providing customer satisfaction as well as achieving better productivity and business performance in the construction industry.

5.3. Recommendations

From the summary of the findings of the study and conclusions drawn; the following recommendations are forwarded towards effectively implementing TQM in order to improve the competitive advantage of the firm.

- Recommendation for foreign-owned construction firms
  - Appropriate resources should be allocated to create awareness about TQM practices for the local employees in order to increase quality.
  - The firms should give more attention to the adaptation of the business cultures of the locals and standards in order to easily implement TQM practices.
  - Different training and workshop programs should be conducted from time to time for employee and management personnel in the firm.
  - More emphasis should be given to the role of top management. Since a key factor in effectively implementing TQM.
  - Management should make sure the right person for every job is hired.
  - The management team should regulate quality policy and develop specific measurable goals to meet customer expectations.
- Recommendation for local owned construction firms
  - Adequate resources should be allocated for creating awareness and for forming a separate department for quality management professionals.
  - Monthly or quarterly training should be given to the top management and employee to better satisfy customers.
  - Top management should ensure all departments and employees are involved in quality management program.
  - The internal and external audit should be conducted in order to ensure whether TQM is properly implemented or not.
  - The management personnel have to be responsible for determining appropriate cost-cutting solutions by using TQM practices in order to increase firms a competitive advantage.
  - More firms should work on getting ISO certified, so they could implement in order to effectively and efficiently practice TQM.

5.4. Future research

In this study, the researcher has tried to analyze, the effect of Total quality management on competitive advantage and how ownership affected in the construction industry of Ethiopia, with only the specific sample of grade one general contractors in. In future research, the sample should include more type of contractors such as building contractors and road contractors. Therefore, it's the researcher's recommendation that future studies should incorporate the suggestion above.

6. Reference

Abu Hassan Bin Abu Bakar, Khalid Bin Ali and Eziaku Onyeizu (2011). Total Quality Management Practices in Large Construction Companies: A Case of Oman, *World Applied Sciences Journal* 15 (2): 285-296.

Abusa, Fuzi (2011). TQM implementation and its impact on organizational performance in developing countries: a case study on Libya, *Doctor of Philosophy thesis, Faculty of Engineering, University of Wollongong*, https://ro.uow.edu.au/theses/3314

Ahire, S.L., Golhar, D.Y., Waller, M.A. (1996). Development and validation of TQM implementation constructs, *Decision Sciences*, 27 (1), 23-56.

Ahire, S.L., O'Shaughnessy, K.C.(1998). The role of top management commitment in quality management: an empirical analysis of the auto parts industry. *International Journal of Quality Science* 3 (1), 5–37.

Alan Bryman & Duncan Cramer (1999). Quantitative Data Analysis with SPSS Release 8 for Windows. A guide for social scientists, *London and New York Routledge is an imprint of the Taylor & Francis Group:*176.

Anderson, J.C., Rungtusanatham, M., Schroeder, R.G., Devaraj, S. (1995). A path analytic model of a theory of quality management underlying the Deming Management Method: preliminary empirical findings. *Decision Sciences* 26, 637–658.

Anderson, R., Reeb, D.M., 2003. Founding family ownership and firm performance: evidence from the S&P 500. *Journal of Finance* 58, 1301–1329.

Arditi, D. and Gunaydin, H. (1997). Total quality management in the construction process. *International Journal of Project Management*, 15(4), pp.235-243.

Asakaoru, T (2016). Total Quality Control, 1 (3).

Aydin Nurhan and Sayim Mustafa. (2007). Foreign Ownership and Firm Performance: Evidence from Turkey. *International Research Journal of Finance and Economics*, 11, 103.

Ayalew M, Tadesse, M.zakaria Dakhli and Pr. Zoubeir Lafhaj, (2016), the Future Lean construction in Ethiopian Construction Industry, 5(02),107.

Barney Jay (1991). Firm Resources and Sustained competitive advantage, *Journal of Management*, 17 (1), 99-120.

Bhat, K. S. and J. Rajashekhar. 2009. An empirical study of barriers to TQM implementation in Indian industries. *The TQM Magazine* 21(3):261-72.

Baye, Haile Yeshanew. and Raju R, Satya R. (2016). The extent of TQM practices in Ethiopian manufacturing firms: An empirical evaluation. *International journal of applied research*. Vol. 2(5) pp 239-244

Besterfiled, Dale H., Besterfield-michna Carol, Besterfieled, Glen H, & Mesterfield-Sacre, Mary. (2003). Total Quality Management. 3rd edition, Prentice Hall.

Boere, A. et al. (2015). Business Opportunities Report Construction. #8 in the series written for the "Ethiopian Netherlands business event, *Rijswijk, The Netherlands*. 5–6

Burati, James L., Jr., Jodi J. Farrington and William B. Ledbetter(1992), Causes of Quality Deviations in Design and Construction, American Society of Civil Engineers, New York, *Journal of Construction Engineering and Management*, Vol. 118,(1) 1.

Bryman, A., & Cramer, D. (1999). Quantitative data analysis with SPSS release 8 for Windows. A guide for social scientists. London and New York: Taylor & Francis GroupBayazit, O. (2003). Total quality management (TQM) practices in Turkish manufacturing organizations. *The TQM Magazine*, 15(5), 176- 258.

Campbell-Hunt, C. (2000). What we learned about generic competitive strategy: a meta-analysis. *Strategic Management Journal*, Vol. 21 (2), 127-54.

Carole Veitch (2018), The Construction Industry in Ethiopia, African business information, https://www.whoownswhom.co.za/store/info/4567?segment.

Chenhall, R. (1997),"Reliance on manufacturing performance measures, total quality management and organizational performance", *Management Accounting Research*, Vol. 8(2), 187-206

Czinkota, M. R., & & Ronkainen. (2005). A Forecast of Globalization, International Business and Trade: Report from a Delphi Study. *Journal of World Business*, 40(2), 111-123.

Chong, V. K., & Rundus, M. J. (2004). Total quality management, market competition and organizational performance. The British Accounting Review, 36(2), 155-172. doi:10.1016/j.bar.2003.10.006

Connelly, b. L., hoskisson, robert e., tihanyi, l., and certo, s. T. (2010), "Ownership as a Form of Corporate Governance," *Journal of management studies*, In press.

Corredor, P. & Goñi, S. (2011). TQM and performance: Is the relationship so obvious? *Journal of Business Research*, 64(8), 830-838.

Crosby, P. B. (1996). Quality is still free: making quality certain in uncertain times. New York:McGraw-Hill.

Curkovic, S., S. Melnyk, R. Calantone, and R. Handfield. (2000). Validating the Malcolm Baldrige national quality award framework through structural equation modeling, International *Journal of Production Research* 38(4). 765- 791.

Daft, R.L., 1998. Organization Theory and Design. South-Western College Publishing, Cincinnati, OH.

Dean, J. and Bowen, D. (1994). Management theory and total quality: improving research and practice through theory development. *Academy of Management Review*, Vol. 19 (3). 392-418.

Deming, W. (1982). Quality, Productivity, and Competitive Position, Center for Advanced Engineering Studies, Massachusetts Institute of Technology, Cambridge, MA (PDF) A meta-analysis of the effect of TQM on competitive advantage. Available from: https://www.researchgate.net/publication/245507180_A_metaanalysis of the effect of TQM on competitive advantage [accessed June 18 2018].

Deming, W.E., 1986. Out of the Crisis. Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, MA. Accessed July 02, 2018, from https://kinasevych.ca/2009/11/30/deming-1986-out-of-the-crisis/

Derso, B.(2018) Ethiopia: Transforming Construction Industry. The Ethiopian Herald. Retrieved July 02, 2018, from https://allafrica.com/stories/201803280594.html

Dinh Thai Hoanga , Barbara Igelb∗ and Tritos Laosirihongthong(2010). Total quality management (TQM) strategy and organisational characteristics: Evidence from a recent WTO member. Total Quality Management *Routledge Taylor & Francis group*. Vol. 21 (9), 931 –951

Duh, Rong-Ruey & Hsu, Audrey & Huang, Pei-Wen. (2012). Determinants and performance effect of TQM practices: An integrated model approach. Total Quality Management & Business Excellence -23. 689-701.

Ephanuts Ndirangu Wandaeri(2015), factors influencing implementation of Total quality management in construction company in Rwanda: a case of fair construction company. *A research*

proposal submitted to the department of Entrepreneurship and Procurement in the School of Human Resource Development in partial fulfillment of the requirement for the award of the degree of Master of Science in Project Management of Jomo Kenyatta University of Agriculture and Technology, 4.

Erande and Pimplikar (2016). Total Quality Management in Indian construction industry. Gunduz, L., and Tatoglo, E., (2003), A comparison of the Financial Characteristics of Group affiliated and Independent Firms in Turkey, *European Business Review,* 15 (1), 48-54.
Feigenbaum, A. V. (1990). Management of quality: the key to the nineties. Journal for Quality and Participation, 13 (2), pp14-19.

Fitza, Markus & Tihanyi, Laszlo. (2017). How much does ownership form matter? DOES OWNERSHIP FORM MATTER? Strategic Management Journal.

Flynn, B.B., Schroder, R.G. and Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. Journal of Operations Management, 11 (3), 339-366.

Flynn, B. B., Schroeder, R. G., & Sakakibara, S.(1995). The impact of quality management practices on performance and competitive advantage. Decision Sciences, 26, pp659- 691.

Feng, Jiang & Prajogo, Daniel & Chuan Tan, Kay & S. Sohal, Amrik. (2006). The impact of TQM practices on performance: A comparative study between Australian and Singaporean organizations. European Journal of Innovation Management. 9. 269-278.

Fuentes-Fuentes, M.M., Albacate-Saez, C.A. and Llorens-Montes, F.J. (2004), "The impact ofenvironmental characteristics on TQM principles and performance*", Omega*, Vol. 32 (6), 425-42.

Gunduz, L., and Tatoglo, E.(2003), A comparison of the Financial Characteristics of Group affiliated and Independent Firms in Turkey, *European Business Review*, 15 (1), 48-54.

Harris, F., & McCaffer, R. (2001). Modern construction management. Oxford: Blackwell Science.

Hassin, E., Tookey, J.E. and Vidalakis, C. (2007) Sustainable Development and TQM Implementation in Libya: A Study of The Electrical Generation Industry. In: Egbu, C.O. and Tong,

M.K.L. (Eds) Procs of the 3rd Scottish Conference for Postgraduate Researchers of the Built and Natural Environment (PRoBE), 20-22 , Glasgow Caledonian University,.203-215

Hendricks K. B, & Singhal V. R. (2000). Firm Characteristics, Total Quality Management, and Financial Performance. *Journal of Operations Management*. 238. 1-17.

Hendricks, C. F., & Triplett, A. (1989). TQM: strategy for '90s management. Personnel Administrator, 34 (12), 42 – 48

Hewitt, S. (1994). Strategic advantages emerge from tactical TQM tools. Quality Progress, 27 (10),57-59.

Hoonakker et al. (2010). Barriers and benefits of quality management in the construction industry: An empirical study. *Total Quality Management Routledge* Vol. 21, No. 9, 953–969

Hockerts, K. & Morsing, M., 2000. A Literature Review on Corporate Social Responsibility in the Innovation Process. Innovation, .1-36. Available at: http://www.mendeley.com/research/a-literature-review-on-corporate-social-responsibility-in-the-innovation-process/. Accessed at Jan 2018.

Hui, M.K., Au, K., & Fock, H. (2004). Empowerment effects across cultures. Journal of International Business Studies, 35(1), 46–60.Harris, F. & McCaffer, R. (2002): Modern Construction Management. E.P.P Books Series Accra, Ghana http://www.enterprisesurveys.org/data/exploreeconomies/2015/ethiopia firm characteristics ownership type.

https://www.accountingtools.com/articles/what-are the benefits-of-total-quality-management-tqm.html, The benefits of total quality management.

https://www.whoownswhom.co.za/store/info/4567?segment African business information

Total quality management in construction, The Construction Industry in Ethiopia. https://www.sciencedirect.com/science/article/abs/pii/S0263786396000762 **Construction Minister (2018)http://allafrica.com/stories/201803260626.html.**

http://www.assignmentpoint.com/business/management/basiconcepts-of-tqm.html, Basic Concepts of TQM.

http://www.comp.dit.ie/dgordon/Podcasts/Interviews/chap15.pdf, cited on 24/8/2012. Interviewing in qualitative research.

Idris, M. A., McEwan, W., and Belavendram, N. (1996). The adoption of ISO 9000 and total quality management in Malaysia. The TQM Magazine, 8(5), 65–68.

Idris shari, Mohd & Zairi, Mohamed. (2006). Sustaining TQM: A Synthesis of Literature and Proposed Research Framework. Total Quality Management and Business Excellence. 17. 1245-1260.

International bank of Reconstruction and development: The World Bank Ethiopia (2015). Country profile Enterprise survey *International Research Journal of Engineering and Technology*, 03, (06) 686.

Iruobe, O. J., Ojambati, T. S., Akinpade, J. A., & Iruobe, T., (2012).An Investigation into the Impact of Total Quality Management Application in the Construction Industry (A Case of Training), *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*3 (1), 3(2), 344-348

JICA.(2013), News: Africa: With JICA's Help, 'Kaizen' Is Being Widely Adopted in Africa.(n.d.). Retrieved May 10, 2018, from https://www.jica.go.jp/english/news/field/2013/130529_01.html

Juran, J.M., 1986. The quality trilogy. Quality Progress 19 (8), 19–24.

Kanji, G., & Wong, A. (1998). Quality culture in the construction industry. Quality management, 9(4–5), 133–140.

Kanji, Gopal K. & Wallace, William. (2000). Business excellence through customer satisfaction, Total Quality Management, 11:7, 979- 998.

Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance, *Journal of operations management*, vol. 21, no. 4,pp. 405-435.

Kenya Institute of Management (2009). Total Quality Management: Theory, Concepts and Practice. *Macmillan Publishers*

Kiwus, C. H. and P.W.Trefor (2001), Application of TQM to Environmental Construction, Journal of Management in Engineering, *ASCE Manager of Journal*, Vol.17 (3), 176-183

Lascelles, D. M. and Dale, B. G. (1990), The use of quality management techniques, Quality Forum, Vol. 16(4), 188-192.

Love, P.E.D., Mandal, P., & Li, H. (1999). Determining the causal structure of rework influences in construction. Construction Management and Economics, 17, 505–517.

Loushine, Todd & Hoonakker, P.L.T. & Carayon, Pascale & J. Smith, Michael. (2006). Quality and Safety Management in Construction. Total Quality Management & Business Excellence. 17. 1171-1212. 10.1080/14783360600750469.

Low Sui Pheng, Darren Wee, (2001) Improving maintenance and reducing building defects through ISO 9000, Journal of Quality in Maintenance Engineering, Vol. 7 (1), 6-24, https://doi.org/10.1108/13552510110386865

Low, Sui Pheng, & Peh, Ke-Wei, (1996). A framework for implementing TQM in construction. *The Tqm Magazine*. 8. 39-46.

Low Sui Pheng1 and Jasmine Ann Teo (2004). Implementing Total Quality Management in Construction Firms, *Journal of management in engineering© ASCE*.

Mahmood and Mohammed (2008), A Conceptual Framework for The Development of Quality Culture in The Construction Industry. In: Dainty, A (Ed) Procs 24th Annual ARCOM Conference, 1-3 September 2008, Cardiff, UK, Association of Researchers in Construction Management, 247-256.

Mersha, Tigneh. (1997). TQM implementation in LDCs: Driving and restraining forces. *International Journal of Operations & Production Management*. 17, 164-183.

Ministry of urban development and construction (2013). Directives for the registration of construction professionals and contractors, *grading system for BCs, RCs and GCs*.

Motwani, J. (2001). Measuring critical factors of TQM, Measuring Business Excellence, Vol. 5 Issue: 2, pp.27-30,

Munizu M.(2013). The Impact of Total Quality Management Practices towards Competitive Advantage and Organizational Performance: Case of Fishery Industry in South Sulawesi Province of Indonesia. *Pakistan Journal of Commerce and Social Sciences*. Vol. 7(1), 184-197

Nesan, L.J., & Holt, G.D. (1999). Empowerment in construction: The way forward for performance improvement. Hertfordshire: *Research Studies Press* LTD.

Nashwan Mohammed Noman Saeedand Awad Sad Hasan (2012). The effect of Total Quality management on construction project performance case study: construction firms in Yemen. *Journal of Science & Technology*, (17), (2), 11.

Oakland, J., & Aldridge, A. (1995). Quality management in civil and structural engineering consulting. *International Journal of Quality and Reliability Management*, 12(3), 32–48.

Parina Patel (2009), Introduction to Quantitative Methods, *empirical law seminar*,11

Peter Hoonakkera∗, Pascale Carayona,b and Todd Loushinec (2010). Barriers and benefits of quality management in the construction industry: An empirical study, *Total Quality Management* 21, (9), 953–969, 1.

Pheng, L. S., & Teo, J. A. (2004). Implementing Total Quality Management in Construction Firms. *Journal of Management in Engineering*,20(1), 8-15. doi:10.1061/(asce)0742-597x(2004)20:1(8)

Porter, L. J. and Parker, A. J. (1993), Total quality management - the critical success factors, Total Quality Management, Vol. 4 (1), 13-22.

Powell, T.C. (1995). Total quality management as competitive advantage: A review and empirical study. *Strategic Management Journal*, 16, 15–37.

Puffer, Sheila & Mccarthy, Daniel. (1996). A Framework for Leadership in a TQM Context. *Journal of Quality Management*. 1. 109-130.

Rad, Mosadegh, A. M. (2005). A survey of total quality management in Iran: Barriers to successful implementation in health care organizations. *Leadership in Health Services*, 18(3), 12–34.

Ramachandran, V. (2010). Total quality management in construction. Edwards, G. (Ed) available at http://www.brighthub.com/office/projectmanagement/articles/86518

Reed, R., Lemak, D.J., Montgomery, J.C. (1996). Beyond process: TQM content and firm performance. *Academy of Management Review* 21, 173–202.

Reed, R., Lemak, D. and Mero, N. (2000). Total quality management and sustainable competitive advantage. *Journal of Quality Management*, Vol. 5 Nos 7/8, pp. 5-26.

Reich, R. (1994). Leadership and the high-performance organization. *Journal for Quality and Participation*, 17 (2), 6 -11.

Rowlinson, S.M., & Walker, A., (1995). The construction industry in Hong Kong. Hong Kong: Longman.

Sadikoglu, E. & Olcay, H. (2014). The effects of total quality management practices on performance and the reasons of and the barriers to TQM practices in Turkey. *Advances in Decision Sciences*, 24(6), 948-975.

Saeed, N., & Hasan, A. S. (2012). The effect of total quality management on construction project proformance case study: construction firms in Yemen. *Journal of Science & Technology*, Vol. (17)(2), 11-30.

Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management* 17, 393–409.

Saraph, J. V., Benson, P. G. and Schroeder, R. G. (1989) An instrument for measuring the critical factors of quality management. *Decision Sciences*, Vol.20, No.4, pp.810-829.

Sanders, M. N.K Lewis. P and Thornhil. A. (2009), research methods for Business students, 5th Edition, FT Prentice hall

Seawright, K. W., & Young, S. T. (1996). A quality definition continuum. Interfaces, 26 (3), 107-113.

Sekaran, U. (2003) 'Research Methods for Business: A Skill Building Approach', 4edn. New York, John Wiley and Sons Inc, 206

Shenawy. El, Tim, Eman & Baker, & David , J. Lemak,. (2007). A meta-analysis of the effect of TQM on competitive advantage. *International Journal of Quality & Reliability Management*. 24. 442-471.

Sigalas, Christos & Pekka-Economou, Victoria. (2013). Revisiting the concept of competitive advantage: Problems and fallacies arising from its conceptualization. *Journal of Strategy and Management*.

Sommerville, J., and Robertson, H. W. 2000. A scorecard approach to benchmarking for total quality construction. *International. Journal of Quality Reliability Management*, 17(4/5), 453–466.

Spitzer, R. D. (1993). TQM: the only source of competitive advantage. Quality Progress, 26 (6), pp59 – 64.

Surya Kumar Namdeo, Sushil Dev Rout (2016), Calculating and interpreting Cronbach's alpha using Rosenberg assessment scale on paediatrician's attitude and perception on self esteem, *International Journal of Community Medicine and Public Health, 3(6), 1374*

Talib, F., & Rahman, Z. (2010). Critical success factors of TQM in service organizations: a proposed model. Services Marketing Quarterly, 31(3), 363-380.

Tichey, N. (1983). Managing Strategic Change. New York: John Wiley & Sons

Veitch, C., 2018, January 30, The Construction Industry in Ethiopia." Retrieved June 02, 2018, from https://www.whoownswhom.co.za/store/info/4567?segment

Villalonga, Belen & Amit, Raphael. (2004). How Do Family Ownership, Control and Management Affect Firm Value? *Journal of Financial Economics*. 80. 385-417.

Westcott, R. (2005). The certified manager of quality/organizational excellence handbook. Milwaukee, Wis.: ASQ Quality Press.

Wiwatanakantag Y. (2001). Controlling shareholders and Corporate Value: Evidence from Thailand. *Pacific Bain Finace, journal* 9: 323-362,

Yavas, B.F., & Rezayat, F. (2003). The impact of culture on managerial perceptions of quality. *International Journal of Cross Cultural Management*, 3(2), 213–234.

Yusuf, Y., Gunasekaran, A., & Dan, G. (2007). Implementation of TQM in China and organization performance: an empirical investigation. Total quality management, 18(5), 509-530.

(PDF) Total quality management and performance: The role of organization supports and coworker support. Available from: https://www.researchgate.net/publication/228654981_Total_quality_management_and_performance_The_role_of_organization_support_and_co-worker_support [accessed Sep 24 2018].

Zadry and Yosuf (2006). Total Quality Management and Theory of Constraints implementation in Malaysian Automotive Suppliers: *A Survey Result; Faculty of Mechanical Engineering, University Technology Malaysia Total Quality Management* 17, (8), 999–1020.

Zewdu and G. T. Aregaw, (2015). Causes of Contractor Cost Overrun in Construction Projects: The Case of Ethiopian Construction Sector, *Int. J. Bus. Econ. Res*, 4, (4)

Appendix A

Questionnaire distributed to local and foreign owned construction firms in Ethiopia

Dear Sir/Madam,

I am conducting a research to examine the relationship between total quality management (TQM), competitive advantage and ownership in the Ethiopian construction sector. The objective of my research is determine whether TQM affects a firm's performance and certain aspects of competitive advantage; and identify possible channels through which firm ownership could mediate the relationship between TQM and performance. The research is conducted as part of my thesis in partial fulfilment for the requirement of a Master's degree program in Total Quality Management and Organizational Excellence.

Please take a moment to completely fill out the questionnaire to the best of your ability and return it to me within 3 days of receiving the questionnaire.

Confidentiality: I confidently assure you that the information you provide in this survey will remain confidential and anonymous. The information you provide will only be used for academic purposes and reported in aggregated form.

If you have any questions or concerns please do not hesitate to directly contact me on my cell phone or email. I thank you in advance for your time in participating in the research.

Sincerely yours,

Netsanet Berhanu
Graduate Student at Addis Ababa University
College of Business and Economics
Cell phone: 0912617758/ 0913227739
E-mail: ntegegn@gmail.com.

Advisor: Ethiopia Legesse Segaro (D. Sc.)

Date the survey is completed ---------- Code:

- No need to write your name or firm Please answer all the question
- Please put a tick mark *"√" or please answer the question on the space provided*

Part I. GENERAL INFORMATION

==========

A. Background information About the respondent

The following questions are regarding the top manager of this establishment (e.g. CEO, general manager).

1. Current position of the respondent

☐ General manager ☐ Assistant manager ☐ Project manager

☐ Contract administer head ☐ Quality head manager

2. Gender

☐ Female ☐ Male

3. Years of experience of the top/project manager in the construction industry

☐ Less than 6 months ☐ 6 months to 2 years

☐ 2 years to 5 years ☐ 5 years and above

4. Highest education level completed for the top/project manager

☐ High School ☐ Diploma

☐ Bachelor's degree ☐ Above Master degree

☐ Master's degree

Background information about the firm

1. Type of firm ownership ☐Local
☐ Foreign

2. What percentage of this firm is owned by each of the following?

Type of ownership status	Percent
Local (Ethiopian) individuals or organizations	%
Foreign individuals or organizations	%
Total	100%

3. What is the nationality of origin of the current largest owner/s?

   _____

4. In what year did this firm begin operations in this country?

   ☐ < 1969 ☐ 1969 – 1984

   ☐ 1985 - 2002 ☐ 2003 - 2018

5. How many full-time permanent employees did this firm employ when it started operations?

   ☐ 10 – 25 ☐ 26 – 40

   ☐ 41- 55 ☐ above 56

6. How many full-time permanent employees currently working in your firm?

   ☐ <100 ☐ 101 -500

   ☐ 501-1000 ☐ above 1000

7. How many full-time employees work in your top management area in the firm?

   ☐ Less than 10 ☐ 16 to 20

   ☐ 10 to 15 ☐ More than 20

8. Does your firm have a website?

   ☐ Yes
   ☐ NO

9. Does the firm use Internet services (e.g. e-mail or a website) to communicate with customers or suppliers?

   ☐ Yes
   ☐ NO

10. In the past 12 months, did the firm train employees to familiarize them with a new technology, process, or marketing practice?

    ☐ Yes
    ☐ NO

11. In the past 12 months, which of the following constraints did the firm face in its operation? Please rank the following in order of importance from 1 to 5 where 1 is most important

constraint to you and 5 is least important constraint to you.

Access to bank loans	☐
Competition from other similar firms	☐
Tax rates	☐
Inadequate workers	☐
Government requirements and regulations	☐
Other sources: _____	

12. Does your firm practice total quality management (TQM)? If you answer "NO" please go to Part III

Yes ☐
NO ☐

Part II- TOTAL QALITY MANAGEMENT

The following questions are pertaining to the extent the firm currently practices total quality management. Please indicate the degree to which you agree or disagree with the following statements (*Please tick only one box*.)

A. **Top management, leadership commitment**	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. Top management takes a leading role in service quality and management							
2. Top management ensures established vision, mission and objectives are communicated and clarified to employees							
3. Management anticipate upcoming changes and plan accordingly on regular basis							
4. Management ensures appropriate number of resources are allocated based on appropriate skill and knowledge							
5. All departments and employees are involved in quality management program							
6. Quality-related training given to managers and supervisors throughout the organization							
7. Top management is committed to employee training							
8. Top management ensures employees are 100% engaged and involved to meet firm's mission							
B. Customer Focus/Feedback system	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. The firm provides excellent service by determining and incorporating customer needs							
2. The firm meets at least 95% of customer expectation							
3. The firm exceeds customer expectation majority of the time							
4. Customer satisfaction is measured and recorded in a regular basis							
5. We are frequently in close contact with our customer							
6. Different means of communication platforms are available for customers to contact the firm (email, phone, website, social media)							

7. Our customer give us feedback on quality and delivery of projects							
8. Customer complaints are addressed in timely manner and recorded for future reference							
9. Customer focused training is provided to all employees							
C. People management -Training of employees, Employee encouragement, Employee Satisfaction, Teamwork	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. Effective hiring process is in place to ensure the right person for the right job							
2. Transparent employee policy and procedure are in place							
3. Transparent and open employee appraisal and recognition system is available to reward employees							
4. Specific work-skills training (technical and vocational) given to all employees throughout the organization							
5. Training in the "total quality concept" (i.e. philosophy of company-wide responsibility for quality) throughout the organization. +							
6. Constructive feedback is provided for employees to improve quality							
7. The firm makes sure safety equipment are available and properly used to carry out day-to-day activities.							
8. Employee promotion and carrier development are usually aligned with quality management							
9. Employee training needs are assessed, planned, prioritized and conducted on a regular basis							
D. Process Management	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. The firm uses a good approach to receive a project from clients							
2. The firm carries out the received project (road, building or dam) designs (architectural, structural, electrical, sanitary, bill of quantity, interior or landscape & others) completed in a timely manner or on agreed scheduled time							
3. The firm would carry out the received projects (road, building or dam) construction process completed with quality							

4. The firm would carry out the received some projects (road, building or dam) finishing (plastering, painting, interior design, etc.) completed with quality and perfection?							
E. Continuous improvement	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. The firm uses a "Plan-DO-Check-Act check checklist to meet customer requirement							
a. Set objectives in accordance with customer requirement and firm policy							
b. The firm implements the process per set objectives and customer requirements							
***c.** The firm monitors and evaluates the process and the service delivered against the firm's policy and set objective on a regular basis*							
d. The firm continuously monitors and reports objective versus result							
2. The firm continuously monitors and improves its process to give quality service to its customers							
3. The firm identifies service defects and ensures such faults do not occur in the future							
F. Close Relationship with supplier	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. Work more closely with supplier							
2. Clarity of specifications provided to suppliers							
3. Evaluate performance of a supplier on project basis							
4. Offer long term relationships for supplier that meet the firm's standard							
5. Require supplier to meet Certain quality specification							
6. Require supplier on time delivery							
7. Work with supplier who adopt quality program							

Part III- Competitive advantage

1. With how many other firms did you directly compete with on the market in the past 12 months?
   ☐ <25 ☐ 26-50
   ☐ 51-75 ☐ >76
2. How has the annual revenue of your firm changed in the last 12 months? (Please tick only one box.)
   ☐ It has significantly decreased------- ‰
   ☐It has decreased------ ‰
   ☐It has stayed about the same------ ‰
   ☐ It has increased------- ‰
   ☐It has significantly increased------ ‰

3. The following questions are pertaining firms competitive advantage. Please indicate the degree to which you agree or disagree with the following statements (*Please tick only one box*.)

Competitive Advantage	**Strongly disagree (1)**	**Disagree (2)**	**Somewhat Disagree(3)**	**Neutral (4)**	**Agree (5)**	**Somewhat Agree(6)**	**Strongly agree (7)**
1. Our revenue increased compared to our competitors for the past fiscal year							
2. We have cost minimization strategy that help us to offer lower price than our competitor							
3. Quality is what differentiate us from our competitor							
4. Our firm Offer unique and differentiated projects to our customer compared to our competitors							
5. Our project is completed and delivered in timely manner compared to our competitors.							
6. Our firm is usually involved in submitting competitive tenders to win contracts							

4. Is the firm competitive advantage mentioned above related to the practice the practice of TQM, if yes please specific which one?

Thank you for your cooperation!!

Appendix B

Interview question

1. Did the firm profit increase during the current fiscal year?

   ☐Yes

   ☐ No

If your answer is yes, what is the percentage of profit increase this year? _____

2. What is the firm's market share?

3. How is the firm's performance with respect to closest (or major) competitor?

_____
_____
_____
_____

4. Form question 11 above, what are the challenges the firms face in practicing TQM or If your firm is not practicing TQM, what are the main reasons?

_____
_____
_____

5. Is the practice of TQM effective in your firm? What mechanisms your firm used to measure its effectiveness?

_____
_____
_____

6. What type of TQM practices does your firm practice to improve company's effectiveness?

_____
_____
_____
_____

7. Is your firm certified to international standards such as the ISO? if so what is the year of certification?

_____
_____

8. Is there anything you like to add regarding TQM implementation and improvement of companies' effectiveness?

_____
_____
_____

Thank you for your cooperation!!

Appendix C

Catego-ries	GRADE	Construction Costs (In Ethiopian Birr)		
		Building Contractor (BC)	Road Contractor (RC)	General Contractor (GC)
GC, BC, RC	1	Above 210,000,000	Above 300,000,000	Above 350,000,000
GC, BC, RC	2	Up to 210,000,000	Up to 300,000,000	Up to 350,000,000
GC, BC, RC	3	Up to 160,000,000	Up to 225,000,000	Up to 270,000,000
GC, BC, RC	4	Up to 110,000,000	Up to 154,000,000	Up to 185,000,000
GC, BC, RC	5	Up to 54,000,000	Up to 76,000,000	Up to 100,000,000
GC, BC, RC	6	Up to 27,000,000	Up to 38,000,000	Up to 45,000,000
GC, BC, RC	7	Up to 11,000,000	Up to 15,000,000	Up to 18,000,000
GC, BC, RC	8	Up to 5,400,000	Up to 7,500,000	Up to 9,000,000
GC, BC, RC	9	Up to 3,000,000	Up to 4,200,000	Up to 5,000,000
GC, BC, RC	10	Up to 1,000,000	Up to 1,500,000	Up to 1,800,000

GC = General Contractors: Contractors who are qualified to undertake a variety of construction work such as buildings, roads, railways, bridges, airports, dams, water-works, etc.

BC = Building Contractors: Contractors who are qualified to undertake building construction and supplementary works on buildings.

RC = Road Contractors: Contractors who are qualified to undertake construction of roads and other related civil engineering works.

SC = Specialized Contractors: Contractors who are qualified to undertake construction activities in specialized fields as classified under the following sub-categories:
1. Electro-Mechanical (SC-EM)
2. Painting and Decorations (SC-PD)
3. Sanitary Installation (SC-SI)
4. Wood and Metal Works (SC-WM)

Grading system for SCs

Catego-ries	RANK	Construction Costs (In Ethiopian Birr)
SC	1	Up to 100,000,000
SC	2	Up to 45,000,000
SC	3	Up to 18,000,000
SC	4	Up to 9,000,000

Source: Ministry of Urban Development and Construction – Directives for the Registration of Construction Professionals and Contractors, June 2013

Appendix D

Name of General contractors(GC) construction firms assessed are listed below: -

No	Company Name	Ownership
1	Bridge Construction P.L.C.	Local
2	DMC Construction PLC	Local
3	Defence Construction & Engineering Enterprise	Local
4	Ethio General Contractor	Local
5	Homa Construction	Local
6	SATCON Construction	Local
7	Tewodros Abera General Contractor	Local
8	Yotek Construction PLC	Local
9	Gemshu Beyene Botte	Local
10	Sur Construction PLC	Local
11	Rama Construction P.L.C	Local
12	Akir Construction PLC	Local
13	Tekleberhan Ambaye Construction P.L.C.	Local
14	N K H Construction PLC	Local
15	Enyi General Business P.L.C.	Local
16	Orchid Bussiness Group P.L.C.	Local
17	Bemacon construction	Local
18	United Construction P.L.C.	Local
19	Bokra Construction & Trading PLC	Local
20	Beaeka General Business PLC	Local
21	Aser Construction PLC	Local
22	Ethiopian Construction Works Corporation	Local
23	Bermog Construction PLC	Local
24	Data Construction PLC	Local
25	Pyramid Construction & Trading PLC	Local
26	Sunshine Construction	Local

27	Afro-Tsion Construction PLC	Local
28	Diriba Defersha Amosha	Local
29	TNT Construction & Trading	Local
30	Giga Construction PLC	Local
31	Cross-Land Construction	Local
32	Elmiolindo contractors PLC	Foreign
33	Midroc Construction PLC	Foreign
34	Keangnam Enterprises Limited/Eth.Branch	Foreign
35	XUEKAI YU	Foreign
36	CGC OverSeas Construction Ethiopia LTD	Foreign
37	China Gezhouba Group Company limited	Foreign
38	China communication construction company	Foreign
39	AKTOR construction	Foreign
40	Salini Costruttori S.P.A Ethiopian Branch	Foreign
41	CRBC Addis Engineering PLC	Foreign
42	Geom Luigi Varnero PLC	Foreign
43	ARAB CONTRACTORS PLC	Foreign
44	Wanton Engineering Construction PLC	Foreign
45	China jigzu construction limited	Foreign
46	China wu yi construction	Foreign
47	Mepo Contracting and Management Services PLC	Foreign
48	Li Yong PLC	Foreign
49	China state construction	Foreign
50	Zhang Guozhen construction	Foreign
51	Jiangxi Zhongmei Engineering Construction Co. LTD(Ethiopian Branch)	Foreign