



**A COMPARATIVE ANALYSIS OF PERFORMANCE OF DOMESTIC AND FOREIGN
CONTRACTORS: THE CASE OF ETHIOPIAN FEDERAL ROAD CONSTRUCTION
PROJECTS**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE MASTER OF PROJECT MANAGEMENT (MAPM).**

SCHOOL OF COMMERCE

COLLEGE OF BUSINESS AND ECONOMICS

BY

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ADDIS ABABA, ETHIOPIA

JUNE 2021

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DECLARATION

I, the undersigned, declare that this thesis is my original work; prepared under the guidance of Dakito Alemu (Ph.D.). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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June 2021

ENDORSEMENT

This thesis has been submitted to Addis Abeba University college of Business and Economics School of Commerce, Graduate Studies for examination with my approval as a university advisor.

DAKITO ALEMU (Ph.D.)

Advisor

Signature

June 2021

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LIST OF ACRONYMS

RSDP - Road Sector Development Program

RRAs- Regional Roads Authorities

WRO- Woreda Road offices

ERA- Ethiopian Road Authority

MOWUD- Ministry of Works and Urban Development

GTP II - Growth Transformational Plan, Phase II

IMD- International Institute for Management and Development

MOFED - Ministry of Finance & Economic Development

MUDC- Ministry of Urban Development and Construction

GCI- Global Competitiveness Index

QS- Quality Surveyor

CAPA- corrective and preventative actions

QA- Quality assurance

QC- Quality control

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ABSTRACT

In Ethiopia, Infrastructure, particularly road construction, has been the most essential driver of economic growth. Simultaneously, it is widely acknowledged and analyzed that the domestic road construction industry is inefficient, threatening its role as a driver of the country's economic growth. Thus, the objective of the study was to make comparative analysis of domestic and foreign contractors in Ethiopian road construction in terms of cost, time, and quality performance. To meet the objective of the study a document review, semi-structured interview, and focused group discussion (FGD) were used as a data collection tool. Based on analysis, the finding shows that the domestic contractors are far from being competitive in terms of cost overrun, time overrun and quality performance. but it is promising progress over time. Finally, the study mainly recommends domestic companies should be mindful of the severe competition they face from foreign firms. This necessitates the participation of both the construction industry and the government in improving the sector's competitiveness, Local road construction firms operate in a challenging business climate. Construction companies' ability to use internal resources such as human resources, finance, equipment and plant, marketing information, technology, and others is encouraged because it gives contractors a competitive advantage. Allocating and effectively utilizing such resources enables them to accomplish many client objectives, such as completing projects on schedule, under budget, and to specified quality standards.

Key words: *Federal Road construction, foreign Contractors, domestic contractors, Project performance, Time overrun, Cost overrun.*

CHAPTER ONE

1 INTRODUCTION

One of the most significant contributors to a country's socioeconomic development is the construction industry. According to Bossink and Brouwers (1996), Infrastructure programs funded by the public sector are an economic and social driver for long-term urban growth that benefits residents. Governments intend to invest money on public works programs that will improve a country's social and economic activities. However, one of the most critical barriers to the country's economic and social progress is a lack of or underdeveloped infrastructure. (Frank B, et al,2013). A marketing insight report by ITE construction and interiors stated that the bulk of the government's capital budget is spent on infrastructure. According to the East African, \$1.5 billion of Ethiopia's \$8.5 billion government budget was spent on infrastructure in 2014. The accomplishment of time, cost, and quality is used to determine whether a project's execution was successful. (Majid, et al, 2006, Sun M, et al, 2013). Delay and cost escalation are two of the most common challenges encountered during the development of infrastructure projects, particularly road and railway constructions. (Mahamid, I, et al, 2012).

Ethiopia has ambitious construction plans for the next five years. GDP II, the focus seems to be mainly focused on infrastructure and housing initiatives. To foster a competitive construction industry in Ethiopia, Project management itself offers scope for international contractors to enter the Ethiopian market. (Du Y. Kim, et al, 2009). Like many developing nations, road construction is an essential part of infrastructure expansion in Ethiopia providing connectivity to both rural and urban areas. Roads are critical for lowering transportation costs and boosting the country's economic growth. However, according to the Ethiopian Roads Authority's report. the road network is still limited, and vast areas of the country are inaccessible. As a result, the majority of Ethiopia's regions are cut off from economic centers, markets, and basic social amenities.

As it is stated on Ethiopian Road Authority (ERA) report, since 1997, the Ethiopian Government through the Ethiopian Roads Authority has been implementing an ambitious program of road infrastructure investment to reduce the accumulated backlog of maintenance, improve road access within and between regions and reduce travel distance

through improvement in road connectivity. Road Sector Development Program (RSDP) has massively improved the performance of the sector in terms of strengthening Road Agencies and their management, improvement in terms of access and quality of road network, creating favorable condition to the domestic construction industry, introducing a series of other policy measures in the sector. However, the RSDP report shows that there is huge gap in terms of delivery of different projects in time and cost. The attainment of time, money, and quality is used to determine whether or not a project's execution was successful. (Majid, et al, 2006. Sun M, et al, 2013). Delay and cost inflation are two of the most common challenges encountered during the construction of infrastructure projects, especially road developments. (Mahamid, I, et al, 2012)

According to the study of Yenealem F (2020) The most common causes of time and cost overruns are outlined as follows, Incomplete research prior to project approval, poor project management and planning, right of way concerns, incorrect schedule projections, psychological biases, and political interests were the top five reasons for delays. Inflationary material costs, scope changes with a change order, unfinished research project approval, insufficient bill of quantity and design and poor project performance monitoring are the top cost overrun causes. This affects clients' and contractors' reputations, results in a loss of profit and investment opportunities, failure to provide value for money and inefficient time management and lays a financial burden on taxpayers.

Abdul Ghafur H, et al, (2016) Owing to the vast number of players involved, whether current or new, from diverse backgrounds and track records, industry players are sometimes faced with stiff and tough competition. Additionally, the vast number of components determining the competitiveness of contractors whose organizational structures and governance have proven to be more muddled. Different construction firms have their own set of standards that may vary from one to the next. The vast number of problems must be reduced to manageable numbers so that steps to improve competition can be defined and analyzed. In our growing construction industry, Thus, this research project tried to measure the comparative analysis of performance of domestic and foreign contractors.

Competitiveness refers to a construction firm's ability to bid effectively, provide superior quality services, and decrease prices all while meeting deadlines. (Shrair's, 2011), Despite its value, however, the industry has and continues to face issues such as cost overruns, schedule delays, poor quality, material waste, inefficient operations, and insufficient productivity. (Abdul-Rahman, et al., 2013; Simpeh 2012). As Hussin, et al., (2013) finding the construction industry faces different problems like time overrun (70% of projects), cost overrun (average 14% of contract cost), and waste generation (approximately 10% of the material cost).

1.2 Statement of the problem

The construction industry contributes significantly to a country's socioeconomic growth, the country's huge infrastructure expansion and urban centers' remarkable construction activities provided an opportunity for taking up the sector and implementers for analysis. However, MoWUD, (2006) the Ministry of Urban Development and Construction stated that the Ethiopian construction industry is unable to meet specified local and international quality requirements, as well as the sector's output expectations. From the beginning to the end of the operation, construction projects have their own procedures and challenges. Time and cost overruns, as well as waste generation, were among the problems (Hussin, et al., 2013) Many issues and problems confront the industry, including time, cost, quality, client satisfaction, productivity, and safety. (Biyadgligh, 2017).

In response to the challenge posed by globalization of the world economy, there has been an increase in questions about international competition over the last two decades (Abdul-Aziz, 1994; Sillars and Kangari, 1997). International differences in, for example, economic, legal, cultural, technical, managerial, and environmental factors, as well as the uniqueness of construction products and the uncertainties in the construction process, render international construction comparisons difficult, but not impossible, as long as they are taken into account when conducting such study. Contractors in Ethiopia will benefit from comparisons and they can provide ideas or methods that can help them enhance their performance.

A few Chinese and Ethiopian enterprises have long dominated the Ethiopian road construction business. As a result, Ethiopia is home to a high number of Chinese businesses

and experts. Government agencies were forced to rely on foreign contractors nearly two decades ago due to strong demand and difficulty of the job, according to the Road sector Development Program (RSDP) analysis, but as competition expanded and price discrepancies became minor, the expanding local construction industry was seriously affected. The current situation shows that local contractors and Chinese companies are in fierce competition, as the latter have built a better reputation and, ironically, have ironically adapted to local conditions, in addition to having demonstrably superior operational capabilities.

Ethiopia's government is spending vast sums of money in several mega projects to boost public service quality. However, failure to meet the construction planned timeline, estimated cost, and necessary quality is a very common problem that affects almost all infrastructure projects. The majority of Ethiopian projects, including Irrigation dams, sugar mills, fertilizer facilities, and road and rail developments, integrated housing development and electrical megaprojects, have failed to meet their objectives. The success of a project's execution is measured in terms of time, cost, and quality. (Majid I, 2006, African Economic Outlook, 2018). Delay and cost inflation are two of the most common problems encountered during the construction of infrastructure projects, especially road constructions. (Mahamid, et al., 2012).

There are widespread reports that some road projects which are carried out by International contractors are relatively completed within reasonable time frame, allocated budget and expected quality of work as against Local contractors which have been completing their projects far beyond the stipulated time frame, with high cost overrun and with less quality of the work. It is discovered why the domestic construction industry's capacity is limited and technologically outdated. However, construction operations are getting more technologically advanced and complex over the world, necessitating larger and more sophisticated capacity. Existing contractors lack the necessary labor and equipment. Furthermore, relative to the quantity of such projects the country is doing, the number of contractors working in higher construction works such as highways and dams is quite low. The thesis' goal is to look at the efficiency and competitiveness of Ethiopian road contractors with foreign contractors in terms of project delivery (time, cost, and quality).

1.3 Research Question

- How efficient are domestic and foreign contractors in project delivery?
- Are the domestic contractors competitive with foreign contractors in Ethiopian road sector?
- How far is the gap of performance of domestic contractors' is compared to foreign contractors?

1.4 Objective of the Study

1.4.1 General Objective

The study aimed objectively to make comparative analysis of performance of domestic and foreign contractors in Ethiopia federal road construction by assessing the performance regarding cost, time, and quality.

1.4.2 Specific Objectives

Once the research is finished, it may be used to assist contractors in developing competitive strategies by considering critical elements affecting their performance both internally and externally. To achieve the stated research goal, the following specific objectives were considered:

- To compare performance of projects of domestic and foreign contractors in terms of their contract value, cost at completion, cost overrun, and the reasons behind.
- To compare performance of domestic and foreign contractors with completion time; comparing time overrun.
- To compare quality of the projects of domestic and foreign contractors in Ethiopian road sector.

1.5 Significance of the Study

This study attempted to analyze and compare the performance of domestic and foreign road contractors at project level in a more pragmatic way Using the so-called "three constraints" of cost, time, and quality. The ability of a project to be finished on time and on budget determines its success. Since there are so many project activities, assignments, and constraints in the industry, it necessitates additional time and expense. Identified gaps will help the domestic contractors to develop effective cost control methods, communication

and coordination among functional departments, and effective site management. As a result of this, different construction participants like project managers, consultants, contractors, site engineers will be conscious enough to think about yielding a maximum outcome of overall competitiveness.

1.6 Scope of the study

The study includes only focused on Road constructions undertaken on federal level and the roadway construction project completed by domestic contractors from 2016 – 2020 and for foreign contractors' projects completed 2018-2020. It is only concerned in projects with a total investment of more than 150 million birr/local currency, existing projects data collected and reviewed construction completion or progress more than 80% reported to the Head Office of the respective agency ERA.

1.7 Limitation of the Study

The study deals only with contractors engaged in the road sector and as such cannot wholly represent the overall construction industry. And It was also difficult to obtain an ordered and conveniently accessible data set during data gathering. secondary data that had been handled by a central department, despite the fact that the cost overruns of road construction project in the agency were secret for stakeholders and public views. The researcher's data collection time and effort are negatively impacted by poor data administration systems and insufficient public exposure of project history; the absence of time series historical data on the industry has hampered comparisons over time, it takes longer than anticipated. Despite these limitations, the research tries to represent patterns and provide a thorough overview of the industry based on key criteria to the greatest extent possible.

1.8 Organization of the Study

Chapter One: Introduction: This section called an overview of the study's research topic. The problem statement, the study's purpose, the study's significance, the study's scope, and the study's limitations were all discussed in this chapter. Chapter Two: Review of related literature: This section of the study reviewed the writings of several authors to give comprehensive information regarding the study's primary subjects. This division was primarily concerned with construction performance, competitiveness, and project management. Chapter Three: Research Methodology: This chapter is all about the

methodology implemented to come up with the findings of the study. the research approach and design, population and samples; and data collection methods used to find out the needed data were discussed. Chapter Four: Data Presentation, Analysis, and Discussion: The outcomes of the data analysis were presented in this chapter. The study findings, which were gathered through contract documents and progress reports, were grouped and discussed. Chapter Five: Summary, Conclusion and Recommendations: In this section of the study sets out the findings of the analysis, highlights the issues facing the industry, and recommends for each issue what actions are needed to remedy the problems, constraints, or needs, in order to improve the efficiency and effectiveness of the domestic construction industry.

CHAPTER TWO

2 REVIEW OF RELATED LITERATURE

In order to have a clear understanding of the study, this chapter provides a detailed review of different works of literature related to the objectives of the study. The literature review is particularly important because it provides a basis for identifying gaps on project success factors of domestic and foreign contractors in road construction industry, and how research questions should be posed, as well as determining the methodology and survey instruments for acquiring data, conducting analysis, interpreting findings, and drawing conclusions. and come up in conclusion and Finally, the Thesis sets out the findings of the analysis, highlights the issues facing the industry, and recommends for each issue what actions are needed to remedy the problems, constraints, or needs, in order to improve the efficiency and effectiveness of the domestic construction industry.

2.1 Theoretical review

2.1.1 Construction Industry Features

Developing a large facility takes time and typically requires a significant financial investment. Cost overruns, delays, and other issues are usually proportionally large, (Abubeker, 2015). Unlike other industries, the construction industry has unique characteristics. In several cases, the construction area has proven to be more complicated than expected during the planning and design process, necessitating additional costs and time. These have an effect on production, as well as the products and work that is currently being done. Because of the varying nature of construction sites, it is difficult to employ mass manufacturing techniques. Because of these variables, estimating the amount of money required to complete construction projects is difficult.

2.1.2 Construction Industry Parties and their Roles

Infrastructure-construction companies are classified into a variety of groups or specialties. General contractors, construction contractors, electro-mechanical service contractors, road contractors, utility contractors, and so on are all types of contractors. There are 3257 general contractors, 2142 construction contractors, and 26 road contractors in Ethiopia, according to estimates from the Ministry in Charge of Contractor Registration. There are 130 contractors in Grade 1 (upper grade), 53 in Grade 2, and 77 in Grade 3. The majority

of the contractors are in Grades 5-7, with the remainder in Grades 8 to 10. (the lowest). Just about 4% of Ethiopian contractors can be classified as high-end companies, capable of competing locally with foreign firms on medium-scale civil construction projects. While the number of small and medium contractors has increased dramatically in recent years, the number and size of large contractors has remained stagnant. In general, the higher number of category's growth has been sluggish, and capacity constraints exist to meet anticipated increasing demand. (Bekele N, 2019).

Clients, government departments, specialist advisors, creditors, subcontractors, and manufacturers are all interested in different interactions with construction firms. Clients award construction contracts to contractors; government departments issue relevant regulations; consultants provide professional services to clients; creditors assist and support contractors financially; subcontractors assist contractors in completing construction works partially or specifically; and suppliers provide necessary materials and equipment for completing construction works. Establishing positive relationships with these parties allows the contractor to achieve and increase the performance of construction projects. In most infrastructure programs, three major project members are involved in order to achieve project objectives. They are referred to as the 3Cs: Client, Consultant, and Contractors. (Chitkara, 2002).

2.1.3 Factors Impacting Project Performance

As discussed in J.Jackson (2002) study Keeping track of project timelines and costs necessitates a proactive mindset. An effective construction manager's ability to predict and avoid future project delays is a key attribute. Even if the project team uses all the resources and strategies at their disposal, most projects would still get derailed at some stage. Over the process of construction, almost every job will encounter time delays, cost overruns, or quality problems.

It is nearly impossible to predict and foresee every conceivable event that could trigger a hiccup in our scheme, no matter how hard we try to make a flawless plan. As a result, hiccups are unavoidable. As a result, it's a good idea to anticipate where these hiccups could occur. A variety of factors may have an effect on our job results. Others are out of our influence, while others are the product of bad management or a lack of foresight. The

following factors are mentioned, along with an explanation of how they can affect project success. (J.Jackson , 2002)

2.1.3.1 Weather conditions

The most popular and obvious cause of work delays that result in cost overruns is weather. Under harsh weather conditions, work moves much more slowly, and the quality of the work suffers as a result. (J.Jackson , 2002)

2.1.3.2 Quality of the workforce

You don't have much influence over the staff of a subcontractor as a general contractor who employs them. As a result, you must trust that your subcontractors can have skilled workers for your project. As a result, I believe that all subcontractors should be pre-qualified. The dangers of poor work quality are important. If there is an issue, the poor quality would necessitate rework, which will slow down job progress and potentially jeopardize worker safety. The possible losses resulting from poor quality can send the whole project into a tailspin, and if this happens, the project manager must act quickly to remedy the situation. (J.Jackson ,2002)

2.1.3.3 Quality of the supervision

Obviously, there would be issues if adequate supervision is not provided on the job. Every day on the job, there are a slew of problems to deal with, and everybody looks to the superintendent for guidance and clarity. You're going to have a catastrophe if you have an inexperienced superintendent who isn't up to speed on the job, the nature of work, or the project management systems in place. (J.Jackson , 2002)

2.1.3.4 Incorrect sequencing of work

Unfortunately, there are occasions that pressure from an owner or the main office causes a superintendent to schedule work out of order even before it is complete, in order to meet an arbitrary deadline. However, no one knows better than the superintendent and the field staff how the job can be scheduled to stay on time. Often a work activity is started only to give the impression of success, when in fact, these false starts waste time and cause all sorts of problems on the job. If this happens often enough, the inefficiencies will finally surface, revealing the true tale. (J.Jackson , 2002)

2.1.3.5 Change orders

One of the most insidious factors affecting project success is change orders. A minor adjustment here and there can seem insignificant. When calculating the cost of the shift, many contractors assume they can fit the extra work into the current schedule and don't ask for more time. And, all of a sudden, these seven or eight minor change orders cause the job to fall two weeks behind schedule, and it becomes a major issue. (J.Jackson , 2002)

2.1.3.6 Overcrowded job site

Getting so many employees on the job is one of the factors that can potentially hinder productivity. I've heard more than one subcontractor complain about cramming so many jobs into a small space in order to complete a job. They end up getting in each other's way, which can lead to a squabble. It becomes so counterproductive that instead of speeding up the job as intended, it slows it down. (J.Jackson , 2002)

2.1.3.7 Defective materials

It is a real pain to find out that the material or equipment you were hoping to build is faulty. It is unquestionably one that can be avoided if sufficient quality management is implemented. However, in some situations, the workers are not aware of the faulty material until they arrive on site and are ready to begin the project. It's just too late at this stage. The time has already been spent and reordering the material and rescheduling the crews to install it would take time. (J.Jackson , 2002).

2.1.3.8 Inadequate tools and equipment

On a construction site, having the appropriate tools and equipment can seem obvious. However, since so much of the contract's function is delegated to subcontractors, you cannot always have power over even the most basic aspects of the job. (J.Jackson , 2002).

2.1.3.9 Late deliveries

One of the most aggravating causes of schedule delays and cost increases in construction is late deliveries. Once again, the contractor has no input or control over the production or fabrication methods used to create many of the project's products or equipment. However, if things are late, the project's stakes may be very high. That is why, on projects with critical

lead times, it's best to appoint someone whose sole responsibility is to expedite deliveries and keep track of the project buyout timeline. (J.Jackson ,2002).

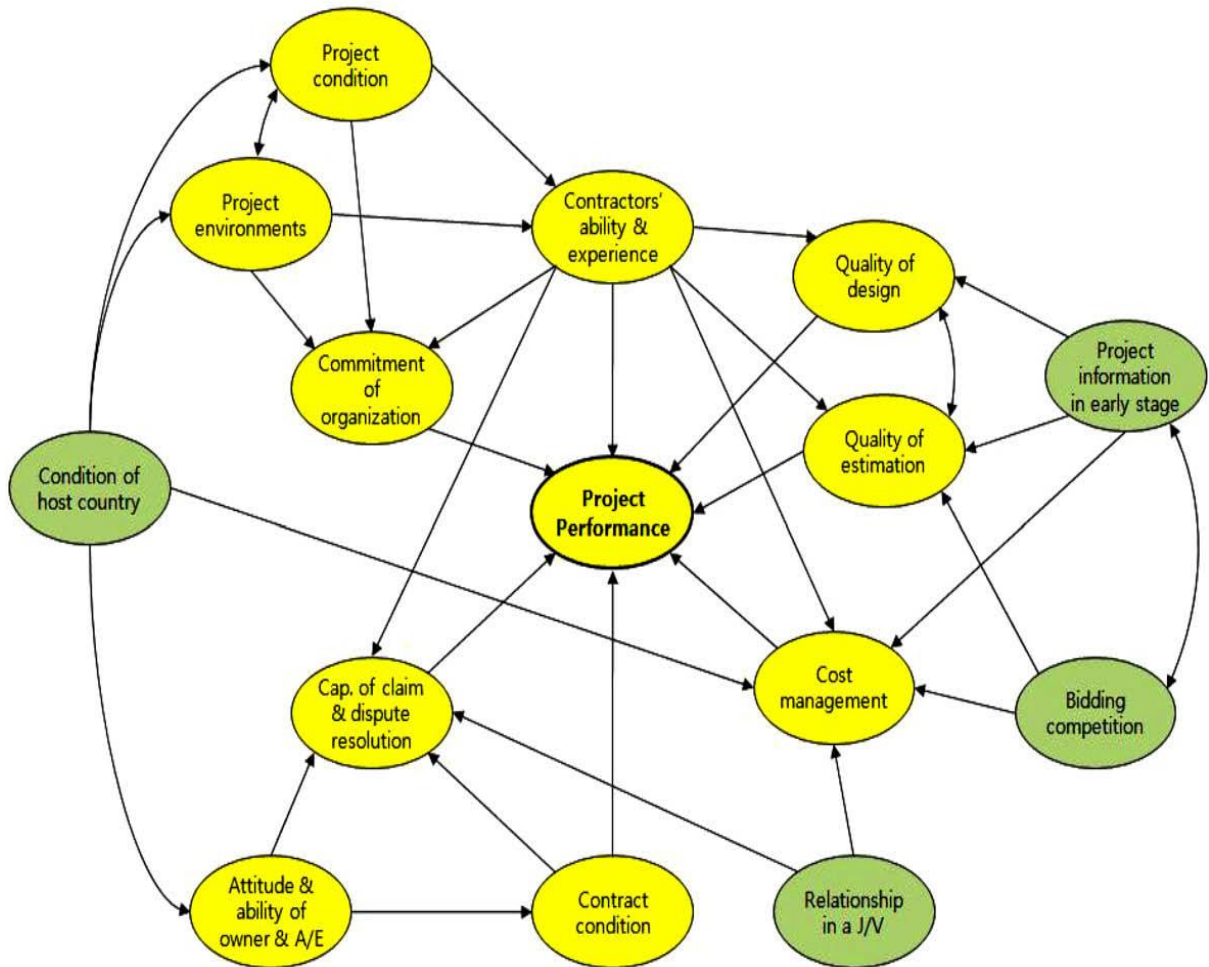
These are only a few of the factors that can potentially have a negative effect on the results of your project, no matter how well you prepared, predicted, and scheduled it to go in a certain direction. Some of them can seem insignificant, but they are precisely the types of items that can quickly throw your expense, time, and efficiency off track. As a construction manager, you must always be alert for potential delays and inefficiencies that might derail your plans. You'll never be able to eliminate all future issues but knowing how various variables can impact the job can give you a leg up when attempting to correct course after a problem arises. (J.Jackson, 2002).

2.1.4 International and Local Contractors

International construction projects are subjected to more complex and diverse factors than domestic projects, and they are often exposed to significant external risks such as political, economic, social, and cultural risks, as well as internal risks from within the project. (D.Y. Kim et al, 2009)

Few researchers have been effective in accurately explaining inter-relationships and causal mechanisms in the domain of international construction projects, considering the complexity of underlying structures in predicting future outcomes. Furthermore, existing approaches are fragmented because they do not address all of the key performance areas for assessing integrated project performance, such as efficiency, cost variance, and schedule performance. (Du Y. Kim, Seung H. Han, 2009)

Figure 2. 1 Project Performance Model (D.Y. Kim et al, 2009)



* Note : Dependent variable (project performance) – level of profit, cost variation, time deviation

Source: Du Y. Kim, 2009)

The authors classified exogenous latent variables as condition of host country, quality of project information obtained at the early stage of the project, relationship in a joint venture, and bidding competition, while designing a conceptual SEM model. This is in line with previous research, which identified the host country's climate, bidding competitiveness, and early project details as boundary conditions for international construction projects.

Project condition, project environment, owner and A/E attitude and abilities, organization system and worker commitment, contractor capability and experience, contract condition and management skill, quality of design, quality of estimate, appropriateness of cost management, and capability are all assumed to be endogenous latent variables that are

influenced by other latent variables. The appropriateness of cost control and the capacity of claim and dispute resolution are two of the ten endogenous latent variables seven variables such as organization system and commitment of workers, contractor's capability and experience, contract condition and management skill, quality of design, quality of estimation that have a direct impact on project success.

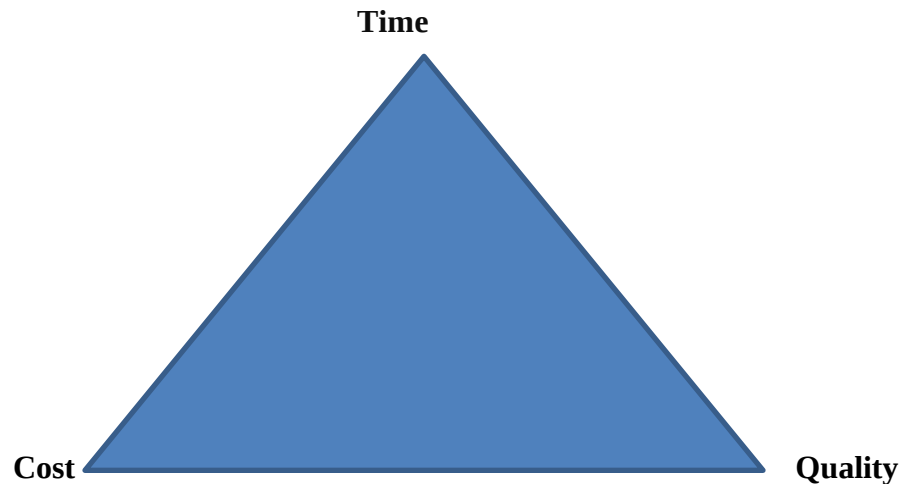
To better represent the real situations related to influencing factors in overseas construction, a conceptual model that shows how the 14 variables influence project output directly or indirectly was created. By conceptualizing the model's variables as Fig 2-2, this model aids in the explanation of a very complex phenomenon.

2.1.5 Project Management

A project is a short-term activity that produces a one-of-a-kind product, service, or outcome. according to the book A guide to the project management body of knowledge (2008). One of the most difficult tasks for project managers is to balance project cost, schedule, and quality. This is tough to achieve because cost, time, and quality are all interwoven to the point where improving one affects the other two. When meeting project goals, project managers usually aim to strike a balance between the three, but they may have to make trade-offs between the three during project execution to achieve objectives and satisfy customers.

Over 50 years Iron triangle is used in project management for measuring project success. Cost, time and quality is a closely related, and change of one effect on the other. Simply completing the project by the given due date and within budget is not sufficient, because the project must also be of acceptable quality. In today's world with a distinct competitive in the business world, the quality is perhaps the most important element of competitive fighting. (BojanStojcetovic, 2019).

Figure 2. 2 Iron Triangle



Source: Bojan Stojcetovic, (2019)

Figure 2. 3 Quality-Cost-Time relationships Model

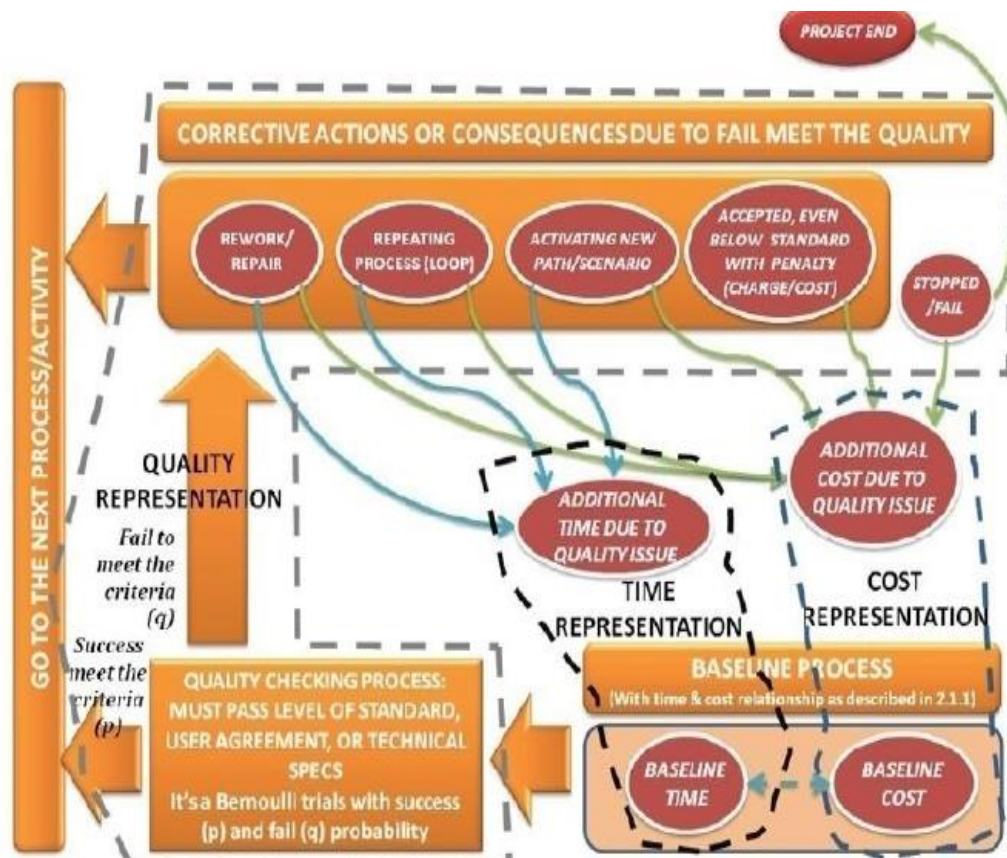


Figure 2 -Quality-cost-time relationship model

Source: B. Stojcetovic.et.al (2019)

There are many examples in practice that projects were delivered on time and within budget but failed to meet the expectations of end users. Every project has an anticipated level of quality for the project deliverables. The details and specifications set out by the customer determine what the expected level of quality is. (B. Stojcetovic.et.al, 2019). The project manager uses a set of management processes to track and control the activities while the project team is physically construction each deliverable. An overview of each management process follows.

2.1.5.1 Project cost management

Estimating, budgeting, and managing costs are all part of project cost management, which ensures that the project is done within the authorized budget. (*A guide to the project management body of knowledge* (2008)) Quality is the solution to cost management and cost cutting in these days. Improvement can be a waste of time because you can't afford it. But, enhance the quality of a process can minimize the errors that come from it. Although the new process may be more costly, it may also be less expensive in the long run because the resulting decrease in defects pays for itself.

Estimate costs (a rough estimate of the monetary resources required to complete project activities), calculate budget (averaging the estimated costs to create a cost baseline), and control costs are all part of cost management (monitoring the status of the project and managing changes to the cost baseline). Costs are essential for the company as well as from a competitive standpoint.

A cost management process is a procedure for formally identifying, approving, and paying project costs or expenses. Cost types are,

- labor costs (for staff, external suppliers, contractors, and consultants)
- Equipment costs (for example computers, furniture, construction facilities, machinery, and vehicles)
- material costs (e.g., stationery, consumables, construction materials, water, and electricity)
- Administration costs (such as legal, insurance, lending, and accounting fees)

The goal of the cost management process is to keep track of all actual costs and expenses incurred during the project life cycle. Cost management is accomplished by completing and approving expenditure forms. Regardless of the amount of expenses incurred, payment to the payee will not be made until the project manager has authorized a full expense form. (Westland, 2006) As mentioned in (Hailemeskel.T,2013)

2.1.5.1.1 Causes of cost overrun.

All project expenditures, including contractor, supplier, equipment, supplies, and administrative costs, should be recorded on expense forms. Total salary expenses can be determined from the timesheet details given to the project manager on a regular basis, but staff salary expenses are excluded. Summarized cost data is often entered into the project plan to monitor real spending versus budgeted spending. While expense forms are normally completed during the project execution process, they can be requested to be completed at any time during the project to ensure that all project costs are collected. (Westland, 2006)as cited in (Hailemeskel.T,2013). The gap between predicted and actual construction expenses is known as construction cost overrun, according to Lee (2008) [13]. Cost overruns can happen to any construction company. Micro-scaled construction firms, on the other hand, are the most affected because they have less resources and are more vulnerable to risks.

Table 2. 1 Causes of cost overrun in Ethiopian road sector.

Cost escalation determinants	ΣF	$\Sigma(W*F)$	W_n	RII	Rank
Inflation of material cost	57	741	15	0.8667	1st
Scope change with change order	53	653	15	0.8214	2nd
Incomplete study to before project approval	45	527	15	0.7807	3rd
Poor Specification/bill of quantity/design flaws	46	516	15	0.7478	4th
Monitoring project performance is ineffective.	43	469	15	0.7271	5th
Shortages of currency to import construction inputs	41	439	15	0.7138	6th
Devolution of value of Ethiopian Birr	54	573	15	0.7074	7th
Financial resource shortages	36	383	15	0.7074	7th
Late clearance /or dispute for third party issues	35	340	15	0.6476	8th
Unforeseen project sites	45	425	15	0.6296	9th
Incompetent bidding process	26	221	15	0.5667	10th
Faulty contract administration	35	268	15	0.5105	11th
Unfavorable weather condition	29	217	15	0.4989	12th
In the sector, there are shortages of trained professionals.	27	186	15	0.4593	13th
Litigation/or contractual agreement problems	24	120	15	0.3333	14th

Source: Yenealem F (2020).

Project cost management include determining the project's cost and ensuring that it is completed within the allocated budget. It includes three principal components, cost estimation, budgeting, and control. The cost estimation component involves estimating the costs of all of the resources that will be charged to the project including labor, equipment, materials, services, and any contingency costs. It is the process of estimating the financial resources required to fulfill project activities. The practice of collecting the expected costs of different activities or work packages to generate a permitted cost baseline is referred to as budgeting. According to the work breakdown structure, cost estimates can be pooled by

work packages (WBS). The cost estimates for the work packages are then aggregated for the WBS (work breakdown structure) higher component levels, and finally for the full project.

Control is the third major component of project cost management, and It is described as the process of keeping track of a project's development in order to provide updates to stakeholders. the project budget and manage changes to the cost baseline. It entails comparing the work completed to the amount spent using a cost baseline and performance data on what has really been done. It entails influencing the factors that lead to changes in authorized cost baselines, as well as influencing the factors that lead to changes in authorized cost baselines. Assisting in the timely processing of change requests Taking care of the actual changes, Costs are being tracked to see whether there are any discrepancies. Keeping track of how well jobs are getting done against how much money is being spent, preventing unauthorized cost or resource changes Notifying appropriate stakeholders of modifications that have been approved and their costs Keeping anticipated cost overruns within acceptable bounds Assuring that the cost of the project does not exceed the budgeted amount.

Monitoring funds spent without regard to the worth of work completed for such expenditures adds no value to the project other than allowing the project team to stay within the permitted budget. The administration of approved cost performance baselines and adjustments to those baselines is critical to effective cost control.

2.1.5.1.2 Keys to Effective Project Cost Management

Effective project cost management is a highly dynamic process that starts early in a project's life cycle, well before it begins. A rational and reliable cost estimation method is one of the factors that influences performance. Some of the most important factors to consider when developing a cost estimation method are mentioned below (keys to effective cost estimation)

A clear, complete, and unambiguous definition of the project and the scope of work involved, thorough assessment of the potential risks involved, with well-thought-out action plans to minimize their possible impact, well-trained and competent project

manager, thorough understanding, by all stakeholders, of the various types of costs that are likely to be incurred throughout the life of the project, project organizational culture where there is a free flow of communication, so that all project participants clearly understand their responsibilities, relevant budgeting, where each work package is allotted its appropriate proportion of the total budget, corresponding with the effort involved, well-defined project work structure where work packages are split down into manageable sizes, an accounting system and coding scheme that are well aligned with the work breakdown structure and are compatible with the organization's management information system, cost accounting system that will accumulate costs and allocate them to their relevant cost accounts as and when they are incurred, prioritized and detailed work schedule, drawn from the work breakdown structure, which assigns and tracks the progress of individual tasks, effective management of well-motivated staff, to guarantee that progress is on track or ahead of schedule, tool for comparing actual and anticipated expenditures for particular jobs and extrapolating the results to the overall project adequate and effective supervision to ensure that all activities are completed correctly the first time, including providing additional resources or taking other prompt remedial measures, the ability to bring key tasks that are late back on schedule, including providing more resources or taking other prompt remedial measures, adequate and effective supervision to ensure that all activities are completed correctly the first time, Supervision of employee time sheets to ensure that only genuine times are recorded against various expense codes. Specifications and contracts must be properly written. A covert inquiry to ensure that the customer is in good financial standing and has the finances to meet all contractual obligations. All key suppliers and subcontractors (especially those new to the contractor's experience) are subjected to a similar scrutiny, though not always as discreetly. To assure the lowest cost compatible with quality and to prevent committing to expenditures that exceed estimates and budgets, competitive tendering should be used for all purchases and subcontractors. Modifications and contract variants are properly considered and controlled, including charging all acceptable price increases to the customer and avoiding all non-essential changes.

notably those that the project's customer would not pay for, Payments to suppliers and subcontractors must be carefully monitored to ensure that no bills or claims for progress payments are overpaid or paid too soon. All incidental expenses that are authorized in the

contract charging structure are recouped (for example, expensive telephone calls, special printing and stationery, travel, and accommodation), Proper invoicing to the client, ensuring that claims for progress payments or cost reimbursements are submitted at the proper times and at the acceptable amounts, avoiding disagreements that could cause payment delays, Effective credit control is necessary to keep client payments from getting past late. Internal security audits are conducted to aid in the prevention of losses caused by theft or fraud. Senior management receives regular cost and progress updates, noting potential schedule or budget overruns in time for remedial action to be done. Value engineering may be used to create a cost-effective design. Prompt account closure at the end of the project to avoid illegitimate time bookings and other items being charged to the project.

2.1.5.2 Project Time Management

Project time management refers to the procedures that must be followed to ensure that a project is completed on time, as specified by the Project Management Institute. Planning is the most important aspect of project time management, followed by monitoring and execution. Deadlines, consumer requests, hard and soft reasoning, and a little foresight can all influence project schedule planning.

Time management is important for any project's success. Lack of plan control is the most common cause of bloated project budgets. To figure out how much time the project will take, we must first figure out how much time each project task will take to complete. Any project can be divided into several activities. To create the project schedule, the project manager must first determine what tasks must be completed, how long they will take, what resources they will need, and in what order they must be completed. (B. Stojcetovic.et.al, 2019)

When time is of the essence, quality and price should be balanced. If a project's completion can be accelerated, more resources will be used, resulting in a cost increase. Changing the time (schedule) can have an effect on both cost and quality. If a project must meet a strict deadline, quality can be sacrificed in order to meet the deadline. (B. Stojcetovic.et.al, 2019)

When a project's length is shortened, more labor and more efficient equipment are required, resulting in higher costs. Obviously, there is a connection between time and cost. Rework is caused by poor output quality. Bad quality products result in product substitution, warranty costs, lost customers, and a tarnished image. Quality saves time and money in the long run. (B. Stojcetic et al., 2019). Attempting to complete a project in a short amount of time will have a negative impact on quality (low quality) and cost (high cost), while taking a long time to complete a project will increase cost and have little impact on quality. Prolonging a project can increase risk, so it's important to strike the right balance between.

Importance of Time Management in Construction is to complete the client's desired structure, construction firms need many experts and skilled employees. Salary is usually charged by the hour, making it one of the most expensive components of a project. As a result, the client needs confirmation that these tools are being used effectively on the job site in order to keep the project on budget. And time management is one way to ensure that everyone is getting the most out of their time. In the construction industry, time management refers to the organization of operations and the application of deliberate time frames to these activities. The key goal of this approach is to improve worker proficiency and productivity.

Although staff may plan their own schedules, it is important that the project manager is in charge of assigning each member's schedule. This is to ensure that all activities are in line with the master plan and that everyday tasks are well-organized. When employees are left alone, they may begin working on any job they want for the day, and without time constraints, they can be tempted to relax.

In short, one of the project manager's duties in construction is time management. It can be difficult to keep everyone functioning together because there are too many employees on the job. Aligning the activities with the builders' schedule and the client's goals can be a lot simpler thanks to current time management strategies and resources like project management software.

Intelligent strategizing is required in the implementation of time management for a wide range of construction activities, especially in planning, scheduling, and prioritizing. But

before going to the strategies on better time management, let's first look into the importance of time management in construction.

- By assigning employees with attainable regular and time frames, effective time control is used to reduce total construction costs. This also ensures that they are making the most of their resources and billing hours.
- Time management divides the client's authorized time period into milestone schedules with the aim of reaching or exceeding the deadline.
- Time management ensures the contractor's profitability because they are legally bound in a contract with the customer, and delays will result in a partial loss of profit or contract termination.

Since time management methods aid in the timely completion of a project, they will impress the customer, resulting in a favorable testimonial for the construction company that would be useful when obtaining new work. It can also gain the client's confidence, resulting in him awarding you a new project. In other words, efficient time management is critical to meeting the contractor's authorized budget and deadline. It's not only a tool for keeping things organized on the job site; it's also the secret to making profit.

2.1.5.2.1 Causes of Time overrun.

Time overrun/Delay in construction is characterized as time exceeding its scheduled timeline, either beyond the date agreed upon by the parties for project delivery or beyond the completion date stated in the contract, and it is a common issue in road construction projects (M. Abubeker J., 2015).

Table 2. 2 Causes of time overrun in Ethiopian road sector.

Technical determinants	ΣF	$\Sigma(W^* F)$	W_n	RII	Rank
Studies that aren't finished before a project is approved	52	525	12	0.8413	1st
Project management and coordination are insufficient.	56	559	12	0.8318	2nd
Right- of-way acquisition issues	62	606	12	0.8145	3rd
Inaccurate forecasting of project schedule	48	463	12	0.8038	4th
Shortage of equipment and materials	47	450	12	0.7979	5th
Financial difficulties	32	267	12	0.6953	6th
Utility accommodation issues	25	202	12	0.6733	7th
Shortage of skilled professionals.	23	170	12	0.6159	8th
Bad weather conditions	29	212	12	0.6092	9th
Difficult site conditions	41	294	12	0.5976	10th
Mandatory reviews of Federal or state legislation	17	93	12	0.4559	11th
National/or State events and holidays	12	46	12	0.3194	12th

Source: Yenealem F (2020).

2.1.5.2.2 Keys for More Effective Time Management

Some construction sites are very busy. When you look at the work of certain project teams, it seems that they are always cramming, and there are two potential explanations for this. The first issue is that the project timeline is too tight and impractical. The second problem is that they do not use proper time management methods in their work.

However, some teams tend to be more reserved. It's possible that they were given a simpler project, but they still excel because project managers are capable of keeping their teams focused and working more diligently, resulting in fewer mistakes. Here are some tried-and-true time management techniques used by project managers.

Plan the project; planning involves more than just a list of important milestones and a timeline for each task. It's also critical to choose the optimal construction approach, order materials on time, and schedule when resources should be on site during the design stage.

Although planning is an important stage to accomplish before the actual construction begins, it is also necessary to plan before daily activities resume. This is since you do not have complete control over what may be accomplished in a single day. Yes, there is a schedule, but as we continually warn you, unanticipated situations can emerge, forcing a schedule adjustment.

Take at least 10 minutes each day before beginning to review the previous day's accomplishments and determine whether the new day's strategy is in line with current progress. If not, make fast adjustments and alert the team as soon as possible. Delegate responsibilities to the appropriate crew member for effective delegation. Members who excel at concreting should be given concreting tasks. Hire a subcontractor if you don't have such a member. Delegating duties to the appropriate individuals saves time, reduces errors, and ensures high-quality work. As a result, project managers must learn how to delegate effectively. **Avoid Distraction;** Distraction should be avoided by both the project manager and his workforce. They must be able to multitask, especially the project manager, who must deal with multiple concerns simultaneously. They should not, however, be sidetracked by little obligations in order to concentrate on the more important ones. Prioritize your tasks before beginning the day's work. Sort them from most important to least important, starting with the most important.

Organize Data; Emails have squandered a lot of time in the past. It used to be the primary method of file sharing, and early email providers lacked filters to distinguish between high-priority communications and spam. Fortunately, today's project management software, such as Pro Crew Schedule, allows data to be shared over the cloud. Documents can be sorted in folders according to your defined categories in this way, ensuring that you discover the relevant document quickly. This is especially necessary for crew members who already have both hands occupied with tools and equipment. **Use Timesaving Tools;** Today, there is a variety of software available for creating crew schedules. Aside from monitoring, construction schedule software can help speed up key operations such as

collaboration and communication. This is especially true if you're using construction scheduling software that's hosted on the cloud. Unfortunately, not all tools will be appropriate for your project, so be thorough in your research while looking for construction scheduling software.

Take Notes; As previously said, project managers are obligated to multitask in order to deal with a variety of challenges and activities on a daily basis. With so many duties on his plate, it's very likely that he'll neglect one or two of them. Taking notes on each assignment will assist him in remembering his priorities. He can record it in his project management software's daily calendar and set up notifications so that no one is left out. Crossing off completed chores will save you time from going over the list again and again, and it will also give you a sense of success, which will motivate you to work more. **Set Some Time for Sudden Urgent Events;** You never know when the client will demand for changes or when your supplier will notify you of a stock shortage. As a result, the project manager should set out a few minutes each day for these types of unexpected disruptions so that you don't have to sacrifice time for other scheduled operations. **Reduce the number of unnecessary chit-chats;** While it is important to have a positive relationship with your crew members by checking on their well-being, it is also acceptable to be unpleasant at times. This is particularly true if the project is already running behind schedule. So, when there are pressing concerns, avoid useless social conversations. Prioritize getting the task done first, then continue the conversation after the shift.

Learn to Say No; When project managers know that accepting change orders or additional tasks will simply cause issues or cause the project to be delayed, they do not have to accept them. Inquire for assistance; Even the most seasoned project manager will occasionally require assistance in completing a task. For example, planning on his own can be challenging, so it's occasionally preferable to undertake some brainstorming with mid-level management to generate relevant ideas and speed up the process. In a construction team, project managers are likely to have the most responsibilities. When he drowns in various tasks and some are left undone, problems may occur. Don't be afraid to seek for assistance. After all, good construction requires collaboration.

Conduct Brief, Actionable Meetings; Despite the fact that there is project management software that allows the team to address significant project issues, meetings are still required from time to time. The issue is that some meetings are poorly handled and take up too much time. Ensure that the meeting follows a pre-determined agenda, and that the topic is timely. If it's simply a minor issue, it can be handled through communication software. Try to avoid wasting time during the meeting as much as possible. Only the essential crew members or those who can make choices should attend the meeting. Getting everyone together when they do not have anything to accomplish during the meeting will merely waste time in getting their attendance. During the meeting, jump right to the most important items on the agenda and leave the less significant items for debate at the end. Avoid chit-chat once more.

The team can finish the project on time if these time management tactics are used effectively. Cooperation is, of course, required to complete them all. Project managers must effectively guide the team in using these strategies. Successful time management also requires the use of dependable construction scheduling software. “Effective time management ideas and their usefulness in construction” (2020)

2.1.5.3 Quality Management in Projects

A quality management process is a system for assuring and controlling the quality of deliverables and management processes during a project. The procedure entails conducting several evaluations in order to evaluate and enhance the efficiency of project deliverables and processes. (Westland, 2006) as cited in (Hailemeskel.T,2013).

The Project Management Institute defines quality as the degree to which a collection of intrinsic qualities meets standards. A product, process, or system may have a set of inherent characteristics. The criteria may be those of consumers or stakeholders, a vital category that is often overlooked, putting the project's progress at risk.

Project Management Institute stated that the processes and activities of the operating company that define quality strategies, goals, and obligations such that the project meets the needs for which it was undertaken are referred to as project quality management. It puts

the quality management system in place using policies and procedures, with continuous process improvement activities carried out as required.

B. Stojcetovic.et.al, (2019), Once a project has been completed, the time and cost tradeoff problems are no longer an issue for the project manager, and quality or performance becomes key issues. A project manager must first understand the quality requirements before he can prepare for them. The project manager and project team must define the planning criteria, decide how the requirements can be fulfilled, and identify the costs and time demands to fulfill the defined requirements as part of quality control. The project is considered satisfactory if the result meets or exceeds the project contractor's standards.

Since the project must be successful, the project contractor prioritizes the availability of the result in the long run. It is not enough to simply finish the project by the deadline and on budget; the job must also be of acceptable quality. Since the contractor is responsible for the project's result, contractor satisfaction is critical to its success.

Rework, modifications, or even project failure can be required if individual tasks are overly crashed. Quality tests must be conducted immediately after each individual operation, and if the quality is not appropriate, corrective steps such as rework or adjustment may be taken. Costs and time will be increased if rework is required to improve efficiency. (B. Stojcetovic.et.al, 2019)

A number of quality related issues are specific to projects. To begin with, assessing project quality is difficult. Sometimes, stakeholders are unable to assess the true quality of project outcomes until they are realized, by which point it is too late to correct any flaws. Alternatively, holes may be filled, but at a cost and time premium. Second, since project results are modern and unusual endeavors (products, services, etc.), there are no or very few quality benchmarks that can be used to assess them. (B. Stojcetovic.et.al, 2019). Quality is designed in, not inspected in, according to one of the main concepts of project quality management. Planning for consistency is less expensive than reviewing job outcomes and redoing it or fixing errors to meet quality requirements. (B. Stojcetovic.et.al, 2019)

Benefits of quality in projects; **Customer satisfaction:** quality project and product will yield customer satisfaction. A satisfied customer may perceive greater value than originally anticipated. **Cost reduction:** quality measures on project activities can reduce waste which directly lead to the cost reduction. As costs go down, profits may go up. **Productivity increasing** shoddy work does not have to be redone so there are no need to spend additional fund to redo the work. (B. Stojcetovic.et.al, 2019)

The theory of quality culture must be stressed in the industry in order to improve the quality of services (design and development processes) and products (facilities constructed) delivered by various organizations in order for construction clients and end-users of completed facilities to get the most out of their investment. As a result, a method for evaluating quality performance is needed to assist construction clients in choosing quality-oriented companies that can deliver higher-quality services and products on time and on budget. (Mahmoud Sodangi and Arazi Bin Idrus).

2.1.5.3.1 What is quality management in construction?

Construction projects cover a wide range of purposes and involve a variety of specialty parties and trades, but one thing they all have in common is a desire to complete high-quality work on schedule and on budget. Quality control is a critical component of total construction project management, and it can mean the difference between success and failure for a corporation. Quality management in construction refers to the policies, processes, and procedures put in place (often by management) to improve an organization's ability to consistently and continuously enhance its capacity to offer quality to its customers, whether those customers are clients/owners, contractors, or subcontractors.

While every construction company on the planet strives for quality in every phase of work and every project, quality is achieved via the establishment of these internal and external standards and guidelines. The following are the main goals of quality management: To Minimize problems during asset delivery or handover and to detect and resolve problems and issues before they affect your customers, thereby protecting your reputation. Obtaining these goals has numerous clear advantages, the most important of which is the ability to continue to earn additional business and establish a strong favorable reputation.

Establishing a robust quality management strategy for construction projects is an excellent strategy to improve quality because preventing mistakes is far more time and cost effective than fixing them. The initial effort in developing a cohesive and comprehensive quality management strategy generally pays off handsomely over the course of a project's life cycle.

As you can see, a quality management plan is a tool that construction companies may use both internally and externally. It guarantees that you are adhering to and meeting the necessary quality standards to execute work legally and feasibly, and that your internal quality control policies and objectives are structured in such a way that allows for continual improvement and, ultimately, good performance.

Establishing quality procedures; After you've developed a quality strategy and your 'goal posts,' the next logical step in quality management is to build procedures that will help you reach your goals. It's easier to sit down and plan than it is to build processes for tens or hundreds of employees who then need to be educated and monitored, etc., so this part of quality management design is frequently more difficult for firms.

In order to achieve this important process alignment, four (4) major areas of process attention must be addressed individually or through a comprehensive quality management system or software. These are the important areas: Document and record control, internal quality audits, non-conformance control, and CAPA (corrective and preventative actions)

These quality procedures, as you can see, build a stack as your work progresses from site capture (documents and records) to corrective and preventative actions (actioning what is captured on site).

Quality management forms and documentation; Quality management documents that are plan-oriented and comprehensive in character, detailing and summarizing quality management at a high level, are often the first step in the quality management process. On projects, a good quality management process focuses on how quality is captured, structured, and tracked from the point on site where it matters the most.

There are dozens, if not hundreds, of quality management forms available, including simple quality punch lists, hold points, and witness points, ITPs (inspection and test plans), and specialized quality forms such as welding quality control checklists. These forms are distributed to engineers, project managers, and other workers to ensure that quality is met and to notify management or other persons if quality is not met, so that the problem can be remedied and addressed by the appropriate party.

Some firms and teams utilize paper-based forms, word documents, and PDFs to manage these forms and paperwork, while others use digital forms, which provide higher quality standardization, control, and insight. Aside from these forms and documentation, quality records, such as images, videos, and other records, are also necessary for any eventuality, including audits.

Although both quality assurance (QA) and quality control (QC) are part of the larger category of construction quality management, their duties and outputs are distinct. Quality assurance, at its most basic level, encompasses processes such as design, development, production, and installation, and is intended to ensure that your consumers 'know' your work will be of good quality, whereas quality control is primarily concerned with monitoring the actual quality of final products by objective measurements and data.

Quality assurance and control are essential components of quality management. It's difficult to create trusting working relationships with other parties who rely on your quality assurance and quality plans to decide whether or not to collaborate with you if you don't have quality assurance. It's also difficult to understand how you're doing in terms of quality without quality control, and it's tough to make data-driven judgments about what has to be improved without it.

In order to facilitate the feedback loop and promote improvement, you'll also need this quality control data to feed into your quality assurance goals and objectives. The many levels of quality control that you require; it is helpful to divide quality management into a couple of layers. It makes it easier for management and individual project teams to understand and manage. Organizational level quality control is the level of quality management that must be focused on.

The levers you have at an organizational level; your processes and procedures, as well as your resources, are the keys to organizational quality control. You'll want to oversee the systematic deployment of processes and tools that can be rolled out across projects and teams, and you'll want to resource, train, and manage projects and activities correctly to ensure that they have the human and other capital they require to complete the work within the quality standards set.

project level quality management, Quality assurance and delivery at the project level is normally handled by a combination of management and project level workers, including project managers who understand how quality is ensured and delivered in the field. Quality assurance concerns and tools are built at this layer to ensure that project level information and insights are recorded, collected, and recorded appropriately, and then communicated to the appropriate places so that the company and project managers understand what's going on and can make good decisions that lead to effective projects. Last but not least, we have the **team and technical layer of quality management**. At this level, teams and corporations are concerned with the actual production of work, as well as how people, equipment, and tools are used to guarantee that jobs are completed within accepted parameters.

2.1.5.3.2 what is retention money in construction contracts?

Deducting retention money is not difficult for most quantity surveyors and contract engineers, according to Amilia Gamage (2019). They're well aware of what's going on. However, it has been observed that numerous contractors are unaware of the true purpose of retention money in their projects. In order to obtain the release of retention monies, subcontractors can also fail to apply their final claim. Despite the fact that these are regular issues with construction project payments, several contractors are perplexed as to why their payment is less than their actual progress.

It's critical to grasp the numerous terms used in regard to retention money before proceeding. All of these parameters have minimal bearing on how much retention will be subtracted. Each jargon has its own set of guidelines. The sum of retention money, the limit of retention, and the release of retention are some of the typical terminology and activities in any construction project dealing with this subject. The procedure for releasing retention

consists of two parts. It's the first and second retention releases, respectively However, we occasionally find that these terms, or the underlying meaning of retention money, are misconstrued. Although the amount of Retention Money varies by contract (due to contract clauses), the terms are defined the same for any construction project anywhere in the world.

As a result, here's a quick rundown of what Retention Money is in construction contracts and how to deal with it as a contractor, quantity surveyor, or contracting engineer. (2019, Amilia Gamage) Retention Money in Construction Contracts refers to the amount of money maintained by the employer as a safeguard against any faulty or non-conforming work produced by the contractor. If the contractor fails to comply with the contract provisions, this clause protects the employer against defects that may develop during the defect's liability period.

In general, Retention Money provides employer insurance. The value of finishing the signed project according to its terms and plans is conveyed by retention money. The contractor must fulfill the scope of work under his contract in order to receive the retention money withheld. This is how the employer is protected from the money spent on monthly improvement claims. The contractor bears responsibility for finishing the construction project according to the design and quality criteria set in the first contract with such a retention in place.

Sample of progress claim on deducting retention money

Work done	248,550.00.
Retention (10%)	<u>-24,855.00</u>
Total claim	223,695.00
Previous certified amount	<u>-140,000.00</u>

AMOUNT DUE IN CLAIM NO. 2 83,695.00

Source Amilia Gamage (2019)

In most construction contracts, the amount of Retention Money to retain in each progress claim is 10% of the work performed plus up to 5% of the contract price. These figures, on the other hand, can differ from contract to contract. As a result, you may need to review the contract agreement for the construction project on which you work before deducting any figure. This is how retention money is deducted from the progress claim. The amount owed on the Interim Payment Certificate shall be calculated at a rate of 90% for completed work and 80% for correctly covered products or goods delivered on site. As a result, the contract's Retention Mo is the percentage of the amount not paid.

The Limit of Retention, which is based on the percentage set in the contract, applies to the retention number. The Retention Limit is commonly set at 5% of the contract value. As a result, after you have reached the Retention Money Limit, you won't be able to subtract any more Retention Money. Following interim certification, the cumulative retention money is subtracted. No additional deductions, however, will be imposed.

Release of retention is another significant word or milestone in any construction contract, indicating that the scope of the project has been completed up to the specified phases. Retention money is usually released in two stages during the project. Release of the first half of the Retention money: When the Completion Certificate is issued, the first half of the Retention money will be certified and released. If there is any incomplete work for the project, the Completion Certificate will mention such.

If the contractor refuses to complete the rejected work or any pending work, QS will deduct a reasonable amount to finish the remaining work. The sum used to cover the costs of employing a third party to finish the remaining work would be this reasonable cost. After the faulty responsibility time has expired, the second half of the Retention money will be certified and released. The Flaws Liability period in most construction contracts is 12 months, during which time the contractor is responsible for rectifying any defects caused by poor performance. The second half of the Retention Money will be returned once the Maintenance Certificate is issued.

The following are mistakes and misconceptions to be aware of as a contractor or QS in charge of a project. Some contractors fail to claim their retention money release on time.

The Final Account stage is critical for any project since it contains various tasks linked to cost management, and retention money protects the employer. Product warranties, on the other hand, are not the same as retention money.

2.1.6 Overall Performance Assessment of Contactors in Ethiopian Road Sector

In Ethiopia, the road network is the most significant infrastructure that connects the country's rural and urban areas. The road system is critical for lowering transportation costs and boosting the country's economic growth. The coverage of the road network was limited to major urban regions and certain rural areas. in the late 1990s. Most of the country was cut off from economic hubs, markets, and basic social services. The existing road network had degraded and was in bad shape.

The Ethiopian government has long recognized that a lack of road network coverage and the poor state of the current network have hampered economic recovery and development. As a result, in 1997, the government initiated the Road Sector Development Program (RSDP) to address road-related issues. Since then, four stages of the RSDP have been introduced between 1997 and 2015, with the fifth phase, RSDP V, beginning in July 2015 and ending in 2020. As it is stated in ERA report.

- RSDP I - 1997 to 2002 (5 years plan)
- RSDP II - 2002 to 2007 (5 years plan)
- RSDP III - 2007 to 2010 (3 years plan)
- RSDP IV - 2010 to 2015 (5 years plan)
- RSDP V - 2015 to 2020 (5 years plan)

Physical works such as trunk and link road reconstruction and upgrades, new link road construction, rural and Woreda road construction, and federal and regional road maintenance Ethiopian Roads Authority (ERA), Regional Roads Authorities (RRAs), and Woreda Road Offices (WRO), have all completed their work and the Community and Municipalities over the course of the RSDP's twenty-three years. A series of policy and

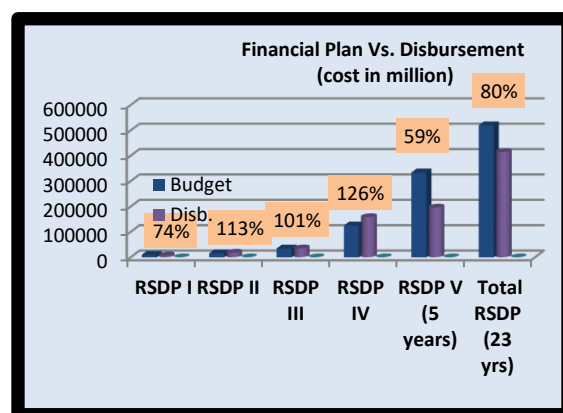
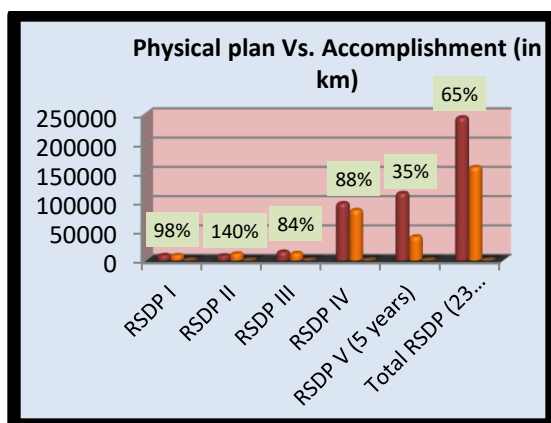
structural reforms have been introduced in the field, enhancing road project execution capability and Road Asset Management effectiveness.

Physical construction on 159,218.4 km of roads has been completed over the course of the RSDP's twenty-three years, excluding regular maintenance and Community roads. The overall budget for planned works during this time period was 520.4 billion. The total sum disbursed in the same era, including all maintenance work, is ETB 414.7. Over the last 23 years, RSDP's physical and financial success against plan has been 65 percent and 80 percent, respectively. Table 3.1 summarizes RSDP's physical and financial results over the past 23 years.

Table 2. 3 Summary of 23yrs Performance of RSDP

Program	Physical Plan Vs. Accomplishment, km			Financial Plan Vs. Disbursement, in million ETB		
	Plan	Actual	% age	Budget	Disb.	% age
RSDP I	8,908	8,709	98	9,812.9	7,284.6	74
RSDP II	82,52	11,589	140	15,985.9	18,112.8	113
RSDP III	14,686	12,395	84	34,643.9	34,957.9	101
RSDP IV	97,517	85,860	88	125,409.1	158,333.3	126
RSDP V (5 years)	114,846	40,665.4	35	334,514.4	196,050.98	59
Total RSDP (23yrs)	244,209. 1	159,218.4	65	520,366.2	414,737.58	80

Source: ERA report (2020)



Source: ERA report (2020)

Table 2. 4 Performance by Implementers (in %)

Program	Federal			Regional			Woreda/URRAP			Overall		
	Plan (km)	Actual (km)	% age	Plan (km)	Actual (km)	% age	Plan (km)	Actual (km)	% age	Plan (km)	Actual (km)	% age
RSDP I	3777	2709	72	5131	6000	117				8908	8709	98
RSDP II	5375	7483	139	2877	4106	143				8252	11589	140
RSDP III	8956	7996	89	5730	4399	77				14686	12395	84
RSDP IV	14782	13633	92	11212	9814	88	71523	62413	87	97,517	85,860	88
RSDP V (5 years)	16786	13973	83	8060	9299	115	90000	17394	19	114846	40665	35
Total RSDP	49676.1	45794	92	33010	33618	101.8	161523	79807	49	244209.13	159218.37	65

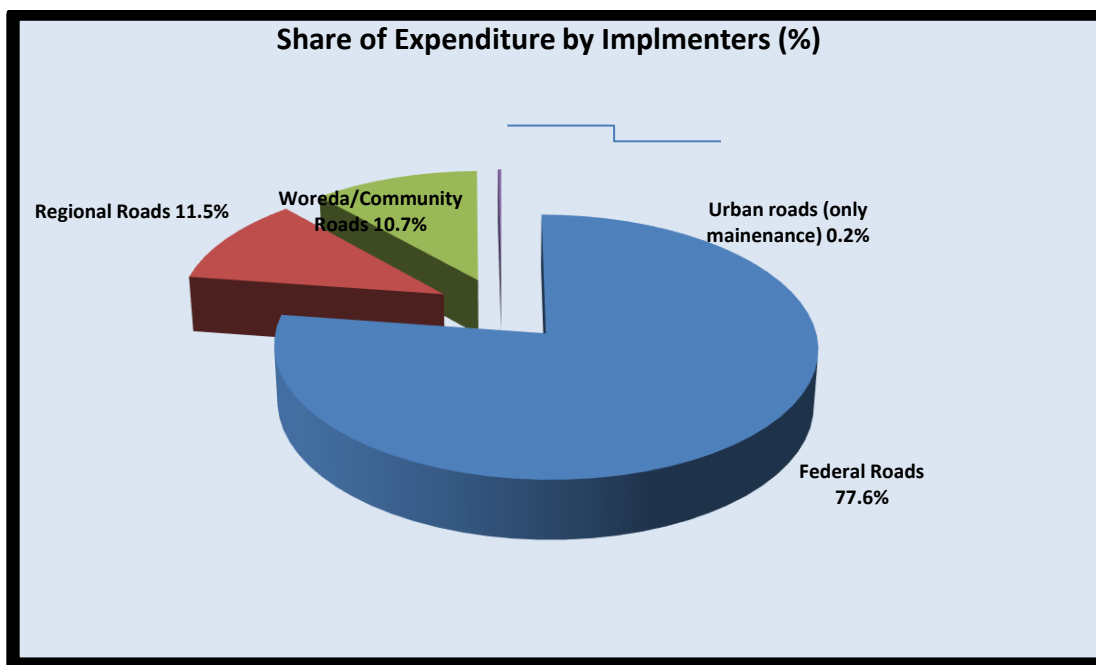
Source: ERA report (2020)

The Fifth Phase of RSDP which is also known as GTP II has been implemented since July 2015. During the past five years of RSDP V, a total of **40,665 km** physical work has been carried out, of which **13,973 km** by Federal Roads, **9,299 km** by Regional Roads and **17,394 km** by Woreda Road Desks. **Error! Reference source not found.** shows performance of RSDP by implementers.

Physical achievements of RSDP-V were 35 % higher than the expected goals. Physical achievement is low, owing to the poor performance of Woreda roads. In addition to the construction work, all types of roads were subjected to routine maintenance. Policy and capacity-construction programs, technical support, comprehensive design/design analysis studies, feasibility and EIA studies are among the studies and services that have been completed.

Over the past 23 years, **34.1%** of the total RSDP expenditure was on rehabilitation and upgrading roads, **32.2%** was on construction of link roads, **4.5%** was on construction of expressways, **4.2%** on maintenance of federal roads, **11.5%** on regional road construction and maintenance and **10.7%** on Woreda roads and **2.6%** was on institutional support projects and other activities at the federal level and **0.2%** for maintenance of urban roads. Figure 2. 4 and table 2-5 show the RSDP expenditure by category and implementers.

Figure 2. 4 Share of Expenditure by Implementers of the Program.



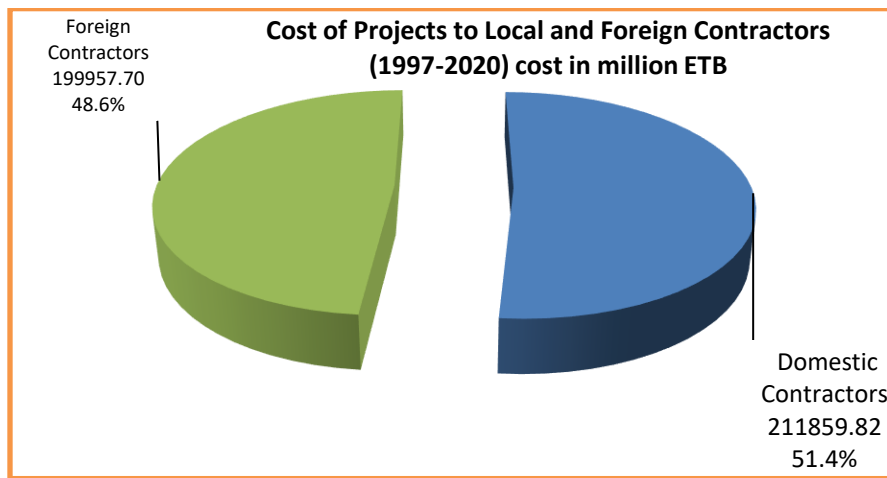
source: ERA report (2020)

2.1.6.1 Capacity of Local Contractors

The program's effect on the domestic construction industry's capacity construction is promising. The local construction industry's involvement in the RSDP has grown in terms

of both value and number of projects over the last twenty-three years. For example, since July 1997, the overall value of contracts awarded to local contractors has been around ETB 211.9 billion, accounting for 51.4 percent of the total contract amount awarded. Some local contractors are now accepting larger contracts worth as much as ETB 3.6 billion. The cumulative cost of projects awarded to local and international contractors is shown in Figure 2.5.

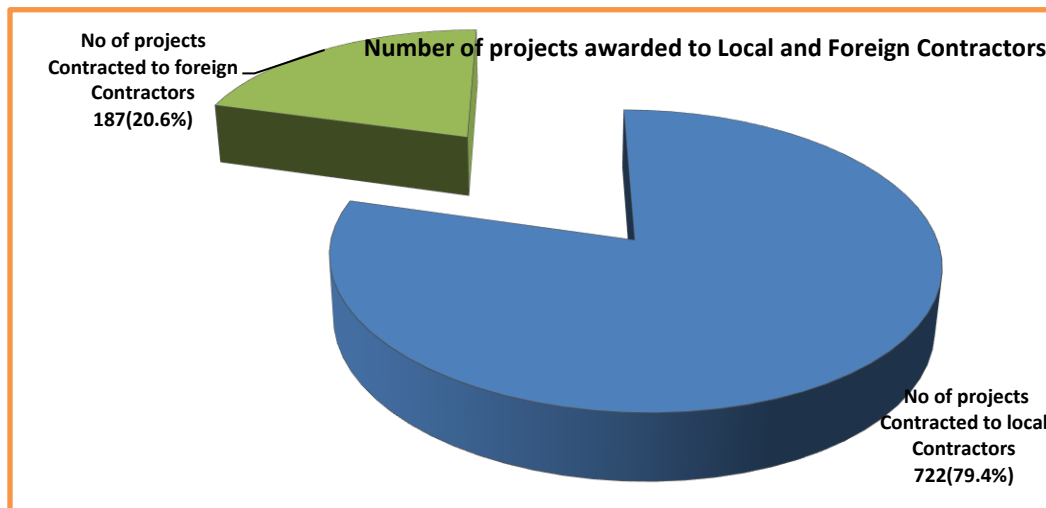
Figure 2. 5 Participation of Domestic and foreign Contractors (1997-2020)



Source: ERA report (2020)

In terms of number of projects, of the **1,964** contracts (both construction & consultancy) Over the course of the RSDP's twenty-three years, 1,543 construction contracts were awarded to domestic enterprises, accounting for 46.8% of all contracts.

Figure 2. 6: Projects Awarded to Local and Foreign Contractors (1998-2020)



Source: ERA report (2020)

2.2 Empirical Study

The study conducted by Ahmed Bubeker titled *a comparative analysis of the competitiveness of construction firms: on federal highway project implementation*. The objective of this study is identifying key competitiveness Indicators (KCIs) for construction firm in the context of Ethiopian Federal Highway construction projects and assessing its association between KCIs and performance of the local construction firms. to do this the researcher uses questioner to collect data and from 110, 102 were returned and based on that the finds are quality works on asphalt road construction projects are ensured through firms' competitiveness (with RIV 93.53 %) and completing project on Time shows firms' competitiveness (with RIV 92.16%) are above the average value RIV. But client satisfaction can be raised by firms' competitiveness (with RIV 87.45 %) and construction firm's competitiveness helps firms' to complete a project within budget (with RIV 87.84%) indicate lower RIV values which are less than section's average RIV (90.25%).

A study with title *Determinants of Infrastructure Project Delays and Cost Escalations in The Cases of Federal Road and Railway Construction Projects in Ethiopia*. The study was carried out by Yenealem Fentahun (2020), The major goal was to figure out what factors influence time and cost overruns in Ethiopian federal road and railway development projects. To do so, the researcher used a purposive sampling methodology to collect data from a specified population of managers and engineers who had suffered delays and cost

overruns from the client, contractor, and consultant. A total of 73 questionnaires were collected, and 18 senior engineers were interviewed using a range of research approaches, with the data analyzed using SPSS and RII for applied and descriptive statistics. To establish the exact extent of time and cost overruns in road and railway construction projects, Secondary data was gathered from 25 road and three railway projects that were completed between 2014 and May 2018 and evaluated using Microsoft Office Excel 2007. According to the inquiry, 88 percent of road and 100 percent of railway construction projects were behind schedule, with 80 percent of road and 100 percent of railway construction projects experiencing cost overruns.

A study titled *Factors influencing Time and Cost Overruns in Road Construction Projects: Addis Ababa, Ethiopian Scenario* by Shambel Gebrehiwot Tadewos, the study's goal was to evaluate the current system and determine the elements that influence time and expense overruns in Addis Ababa road projects. This is based on a thorough review of the literature. The study conducted a desk study on 10 completed road projects in Addis Ababa in its findings, 10 of them had experienced time overrun and cost overrun. Thus, they take more time and cost than what had been estimated. The rates are ranging from a minimum of 25% to the maximum of 264.38% time and a minimum of 4.11% to the maximum of 135.06% of cost.

Chitkara (2011) defined Cost as the a budgeted expense that the owner has agreed to make the creation/acquisition of the desired facility. The term "cost overrun" or "over budget" refers to when actual costs surpass predicted costs. It is defined as the difference between the overall cost of a construction project after completion and the contract price agreed upon by the customer and contractor at the time of contract signing 1st (M. Abubeker J., 2015). Chitkara (2011) defines actual cost as "accountable costs actually spent at the time of project completion." Estimated costs are those that have been budgeted or expected at the time of project approval.

The other study titled *Factors affecting competitiveness small contractors in construction industry* by G J Johari, E Walujodjati, S Mulyana and S Permana, the objective of the study was to identify what factors influence competitiveness and identify what are the dominant factors that affect the competitiveness of small contractors in the construction industry in

West Java. To do this the author uses descriptive and explanatory research methods which are then processed by statistical methods using validation tests, reliability tests, and factor analysis. Using the data, the study identified 1 dominant factor that influences the competitiveness of small contractors in the construction industry in West Java, namely project management factors. These indicators are, Location management, Cost management, Quality management, Time management, Contract management, Problem solving expertise, Risk management, Logistics and supply chain management, Effectiveness in coordination with subcontractors, Effectiveness in site safety management, Knowledge of local construction law, Number of major accidents in the last 3 years, and the contract ratio successfully committed. for project implementation, Coordination of all activities and labor involved.

A other study entitled: *The Ethiopian Road Construction Industry: How Competitive is it?* by Bekele N (2019), The Ethiopian construction industry's existing competitiveness was examined, and the elements needed for a strategy to improve future competitiveness were developed. To process and analyze data, the researcher employed quantitative analysis as the primary research method, which was supplemented by qualitative analysis. Productivity, project performance/delivery, financial performance, growth and market share, and organizational capability/excellence are among the parameters that have been reassessed in assessing business and industry competitiveness. When compared to foreign enterprises operating in Ethiopia's road sector, the survey concluded that the domestic construction industry's competitiveness is at an all-time low.

In the study 'Elements of Cost and Schedule Overrun in Construction Projects,' K. Vaibhav Y. and Dr. D.M. Ghaitidak (2016) found in the construction industry, time and expense overruns are a typical worry. They concluded that the principal reasons of delays and overruns were site acquisition, tender cancellation, poor contractor mobilization, equipment erection, fund constraints, law and order difficulties, delays in equipment delivery, scope revisions, forest clearance, slow construction progress, and cost escalation.

Ten completed road improvements in Addis Ababa were the subject of a desk research (M. Abubeker J., 2015). Ten of them, according to the studies, have encountered time and cost overruns. As a result, they take longer and cost more than expected. The rates vary between

a minimum of 25% and a high of 264.38 percent time and a minimum of 4.11 percent and a maximum of 135.06 % cost.

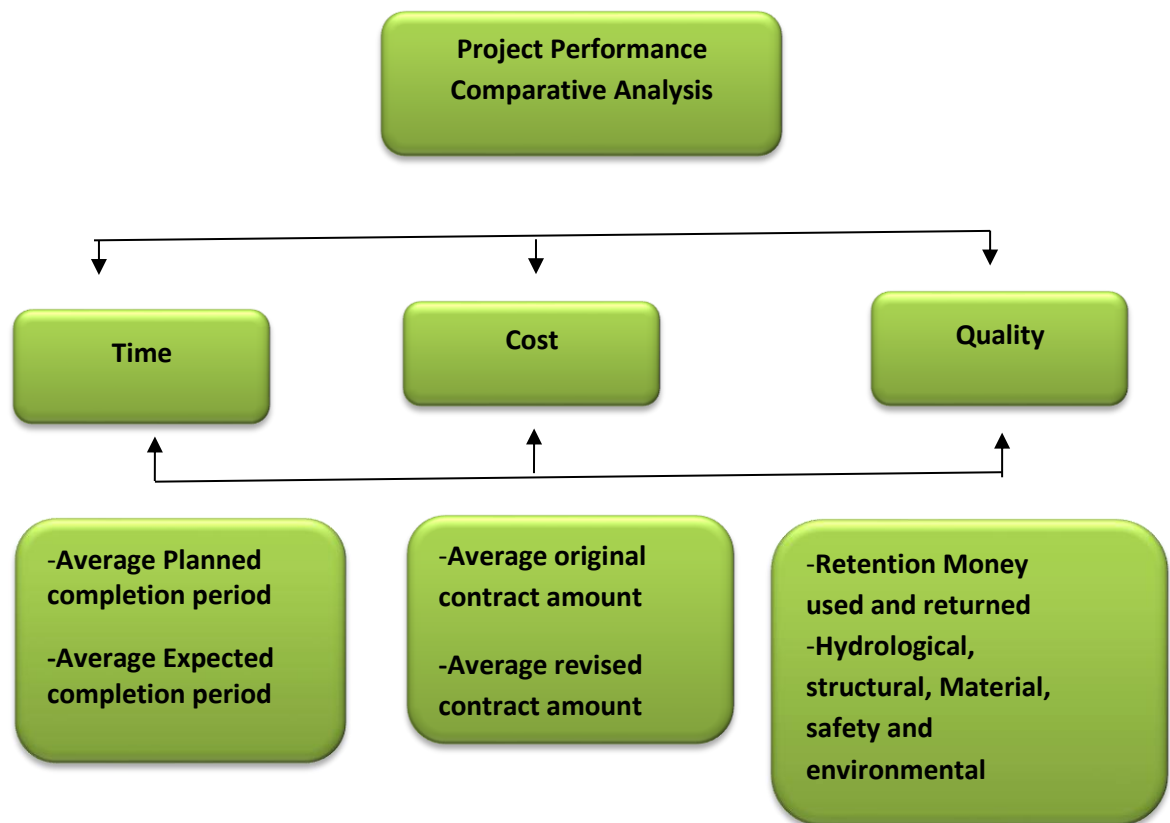
2.3 Research Gap

Despite the researchers' efforts to review various literatures, including the ones listed above, there are almost no studies which have been conducted to understand the comparative analysis between the domestic and foreign contractors of the construction industry in Ethiopian road sector. And a study conducted by Ahmed Bubeker (2018) recommended to study on Comparison of contractors' competitiveness and competitive strategies between local contractors and other countries. Better competitiveness means better products, better project performance, and lower costs translate directly into increased competitiveness.

2.4 Conceptual Framework

Figure 2. 7: Conceptual framework

Source: Compiled from literature



CHAPTER THREE

3 RESEARCH METHODOLOGY

3.1 Introduction

The methodology used to achieve the study's goal is detailed in this chapter. This section goes into the research methodology and design, the population and samples, the data collection instruments used, data interpretation, and ethical considerations in detail.

3.2 Research Design

The study took a descriptive approach since it began with describing a general observation of existing differences between foreign and domestic contractors in the road construction deliverables, and to find out a way for domestic contractors to be efficient and competitive.

The research design was descriptive types. The analysis is based on observations of real-world problems and determines whether or not there is real difference in performance between foreign and domestic in almost completed projects. It was descriptive because it attempted to explain the comparison of domestic and foreign with respects to time, cost, and quality in the projects.

To achieve the goals, the study technique used a mixed methodology that primarily centered on Easy tubular formats were built using secondary data gathered from the Ethiopian Road Authority's (ERA) project completion report. And a primary data survey conducted through semi structured interview and focused group discussion to support the data on quality audit report document, that were physically presented in the head office (ERA).

3.3 Research Approach

To achieve the objective of the study, a quantitative and qualitative (mixed) research approach was used. The advantage of using a mixed method approach is that it compensates for the shortcomings of each approach by using the strengths of the other (Mark, 2009).

The quantitative analysis methodology, according to Creswell (2003), counts items, analyzes data statistically, and quotes findings in numeric types. This method is used to discover information from reports and documents. To collect measurable data, the

approach relies on experiments and surveys. Therefore, the quantitative method was used to find out how much is the gap of performance of domestic contractors comparing with foreign regards time and cost overrun., or where the population is very small and specific. measure cost and time of the projects on contract documents.

A qualitative research methodology, according to Creswell (2003), measures attitude through the measurement of opinions, perspectives, and perceptions. The goal of this technique is to have detailed knowledge about a specific phenomenon rather than make statistical inferences. As a result, a qualitative research methodology was used to understand respondents' perceptions of project quality through document examination. Furthermore, utilizing a targeted group discussion style, this methodology was used to illustrate how competitive domestic and foreign contractors are on the projects quality.

3.4 Research Population and Sampling

3.4.1 Population of the study

Contractors are chosen based on the scope of the study that are participated in the construction of road projects. From projects completed on the last five years 44 projects were completed by local contractors and 32 projects were completed by foreign contractors from total of 76 projects based on the scope (80 % progress and more than 150 METB contract amount) of the study. From total of 44 projects done by domestic contractors 25 grade one contractors were participated, and from 32 projects done by foreigner 16 construction companies were participated. And also, for semi structured interview and FGD central region team leader and from performance, quality and system directorate 2 junior quality audit specialists and team leader of ERA were participated. When it came to secondary results, the researcher only looked at design-build road projects that were completed between 2016 and 2020 for foreign contractors only 3 years data 2018 -2020 were found and used the average of time /cost for each year by taking out extremely max and minimum of time and cost. Average time variation and cost overrun were obtained.

3.4.2 Sample method

The projects included in the study are projects which is completed or progressed more than 80% from 2016-2020, and for foreign contractors only 3 years data 2018 -2020 were found,

and the amount of contract volume more than 150 million Ethiopian birr. Purposive sampling was used, the reason for selecting The higher the contract volume and the more involved the projects, the greater the risk of missing estimated costs and timelines. and the projects must be completed or must be at the acceptable stage to estimate the overall project delay and escalation of cost and quality performance. For the primary data source, the respondents were chosen using purposive sampling, as it is a valuable tool that permits a researcher to collect data from a subset of the population that the researcher believes is the most informed about the topic of road construction project in retention, quality audit teams that works in ERA, So the sample which is selected by purposive can be said it is representative to the targeted population.

3.5 Data source and data collection tool

3.5.1 Data sources

To obtain adequate and appropriate data to address the research questions, both primary and secondary data sources were used for the analysis. The primary data was collected from focus group discussion and semi-structured interview which includes a discussion made with the construction professionals in quality audit, the data collected was used to discover how the retention money was used and how quality. The secondary data sources were collected primarily from each project's progress reports in order to answer to the research's objectives through desktop analysis, the information covers, among other things, the project's start and expected/actual completion dates, as well as the original and revised contract amounts. The data collected were used to identify time and cost variation and compare value/amount among contractors of the selected projects and from quality audit reports hydrological. Structural, safety and environmental performance.

3.5.2 Data Collection tools

As it is stated above, the study used Microsoft Excel to filter projects based on the study scope as a strategy to meet the stated objectives. To address the study questions, desktop review, a semi structured interview and a focused group discussion were employed as research strategies. Desktop review was conducted for cost and time performance to screen out projects based on the scope, and Semi structured interview was used to know how the quality is measured and retention money usage for defects. On the other hand, focused

group discussion was used to support the findings from document reviews for quality performance. For the primary data the following strategies are used,

I. Semi-structured interview

According to Mark et al., (2016) a semi-structured interview is a qualitative data gathering tool in which the interviewer does not strictly adhere to formal questions and instead has a list of a general theme and a list of essential questions. A semi-structured interview was used to obtain data from about the retention money. a semi structured interview is a meeting in which the interviewer does not strictly follow a formalized list of questions. Instead, they will ask more open-ended questions, allowing for a discussion with the interviewee rather than a straightforward question and answer format. This is used to collect quality issue and the perception of quality audit professionals.

II. Document review

The objective of document review was to verify that proper procedures of procurement and administration of the works have been practiced and to verify that works have been executed in accordance with the conditions of contract. To obtain information about project status, contract amount, contract period from project status reports, and to obtain information about quality from quality audit reports, causes of time and cost overrun as per Yenealem F (2020) and the overall performance of RSDP in road construction industry. So, using these documents the researcher was able to quantify quality performance and know what causes time slippage and cost escalation.

III. Focus Group Discussion

Focused group discussion is also one of the commonly used qualitative research methods, used in data collection. A focus group usually includes a limited number of respondents (6-10) from within your target market. the quality is analyzed through document review of quality audit report document. So, the question how efficient domestic contractors in project delivery in quality will be answered through the semi structured interview strategy.

3.6 Data Analysis

The secondary data was collected and analyzed using Microsoft Excel 2007 model. The actual magnitude of cost inflation and schedule slippage over the course of a year for the

average of all road projects. For projects that were completed between 2016 and 2020, was determined using Microsoft Windows Excel 2007.

$$\text{Average contract period in a year} = \text{Mean} = \sum x/n$$

Where,

- x is duration of project in days.
- n is number of projects each year.

$\text{Time overrun} = \text{Contract Period (Average Revised)} - \text{Average Planned}$

$$\text{Average contract amount} = \text{Mean} = \sum x/n$$

Where

- x is contract amount in METB.
- n is number of projects each year.

$\text{Cost overrun} = \text{contract amount (Average Revised)} - \text{Average Original}$
--

Finally, the data gathered from the interview was used to analyses quality through the retention money and perception of overall quality performance of contractors. And data from FGD is used to support the data gathered from document review of quality audit report.

3.7 Variable definition

For the purpose of this study time overrun is the difference between revised completion date and original completion date. A delay is an activity or condition that causes a project to be completed later than the contract stipulated. It is possible to file a claim for a delay. in the form of a contract extension, monetary compensation, or both, as in the case of Flyvbjerg B, et al, (2003). Delay in construction can be characterized as time overrun, slipping past a project's anticipated delivery date, or beyond a contract's completion deadline, and it is a common problem in construction projects (M. Abubeker J., 2015).

Cost overrun is the difference between revised contract amount and original contract amount. Cost overrun is defined as the difference between the final completed cost of a project task completion and the initial cost estimated during the planning period, as Turochy R, et al, (2001). Cost overrun, according to Lee (2008), is the difference between estimated and actual construction costs. Cost overruns can happen to any construction enterprise. Micro-scaled construction enterprises, on the other hand, are the most affected because they have low cash and are more vulnerable to dangers.

Quality is measured through retention money usage and findings of materials evaluation, structural evaluation, and Environmental Assessment and safety issues, evaluation of the field and laboratory test results to comply with standard technical specification and employer's requirement.

Domestic contractors in this study are 25 Grade 1 contractors whose project completed from 2016-2020 and 16 foreign contractors that are Chinese construction companies whose projects completed from 2018-2020.

3.8 Ethical considerations

Throughout the process of doing the study, the ethical requirements of a study were carried out. First, when reviewing secondary data from status reports, journals, articles, proceedings and related sources, every source used was acknowledged both in-text citation and referencing.

CHAPTER FOUR

4 DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter deals with the This section examines the delivery of road projects by both domestic and Foreign contractors of the information gathered from secondary sources; In the analysis, the results have been grouped into three categories which includes analysis of project performance of domestic and foreign contractors with respect to key performance indicator (cost, time and quality) of domestic and foreign contractors in Ethiopia on projects construction completed from 2016 to 2020, and comparative analysis of domestic and foreign contractors in the past five years. the data was collected from The Ethiopian Roads Authority (ERA). The Ethiopian Roads Authority publishes regular progress reports that include details on project success in terms of key performance indicators such as time and cost. The information contains, among other items, the project's start and expected/actual completion dates, as well as the original and updated contract amounts. The results of the study of projects that often-included time overruns and cost overruns were divided into groups of project success by domestic and foreign contractors.

4.2 Project Cost Performance

This section presented, discussed, and analyzed cost performance of domestic contractors, cost performance of foreign contractors with respect to average original and revised contract amount. And also compare cost overrun of domestic vs foreign.

4.2.1 Cost Performance of Domestic Contractors.

It is clear from the selected federal road projects completed by domestic contractors during the last 5 years that some project finished on original budget and some above the budget. In 2020 the original contract amount was 561.048 million Ethiopian birr but at the completion of the project it costs 552.7513 METB this means 1.4787 METB lower than original plan. Rather in 2019 the original contract amount was 523.425 METB and revised contract amount 577.37 METB. The table 4.1 Below shows the average original and average revised contract amount in METB over the last five years.

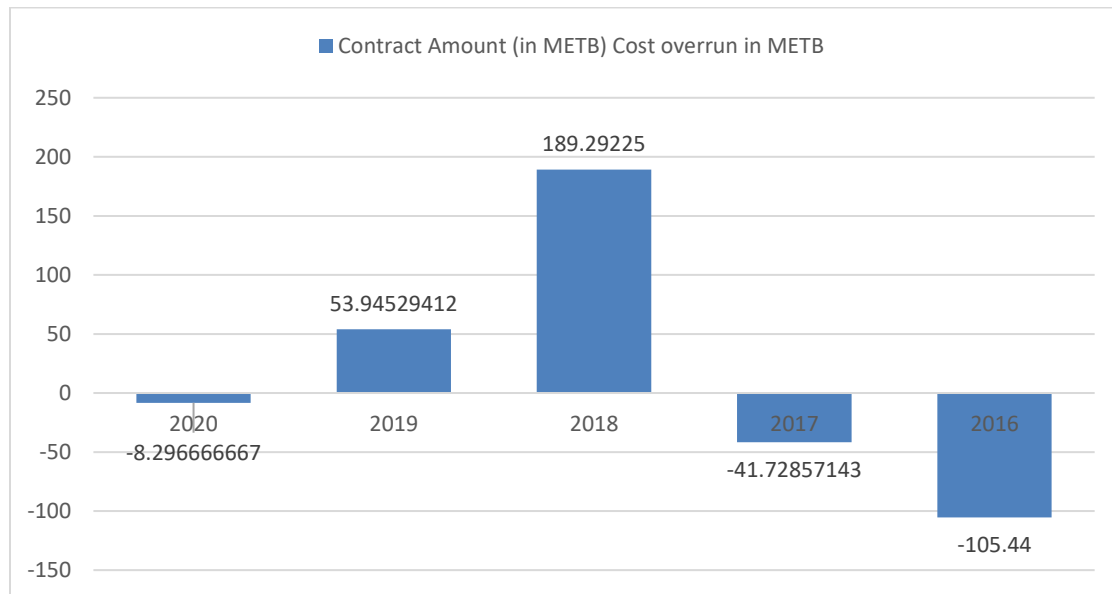
Table 4. 1 Average Original and Revised Contract amount of domestic contractors.

Year	Average Original contract amount (METB)	Average Revised contract amount (METB)	Cost overrun in METB	Cost overrun (%)
2020	561.048	552.7513	-8.29667	-1.47878
2019	523.4253	577.3706	53.94529	10.30621
2018	418.1028	607.395	189.2923	45.2741
2017	885.8343	844.1057	-41.7286	-4.71065
2016	541.71	436.27	-105.44	-19.4643

source: Researcher's analysis based on ERA records, (2021)

Surprisingly not all the projects contracted to domestic contractors have fallen over the estimated budget. the data shows that there is a variation in original contract amount. Most of federal road projects executed by domestic contractors do not finish the project on budget but some finishes on the revised budget, of the selected federal road projects executed by domestic contractors during the last 5 years, it shows that it takes additional cost to finish the project. In 2018 the average original cost exceeds the average revised/completion cost by 45% whereas in 2020 the original contract amount fails under by 1.47% than the revised contract amount. comparative evaluation of average original and revised contract amount of the selected federal road projects executed by domestic contractors during the last 5 years.

Figure 4. 1: Cost overrun of federal road projects by domestic contractors.



Source: Researcher's analysis based on ERA records, 2021

During the last 5 years **Cost overrun** of federal road projects executed in Ethiopia, of some projects executed by local contractors have not been completed on the original contract amount. some projects take additional budget to complete the project and some just finished below the expected budget.in 2019 the cost overrun was 53.945 METB and in 2017 the project ended below the expected budget by 8.296 METB. The cost overrun of the selected federal road projects by domestic contractors during the last five years is shown in Figure 4.1 above.

4.2.2 Cost Performance of Foreign Contractors.

The majority of federal road projects entrusted to foreign contractors have failed to meet their deadlines. It is clear from a review of selected federal road projects completed by foreign contractors during the last five years that there are additional costs associated with completing the project. In 2020 the average original contract amount was 1071.426 METB whereas the average revised/completion contract amount was 1079.07 METB. The average time overrun in the last five years is shown in Table 4.2 below.

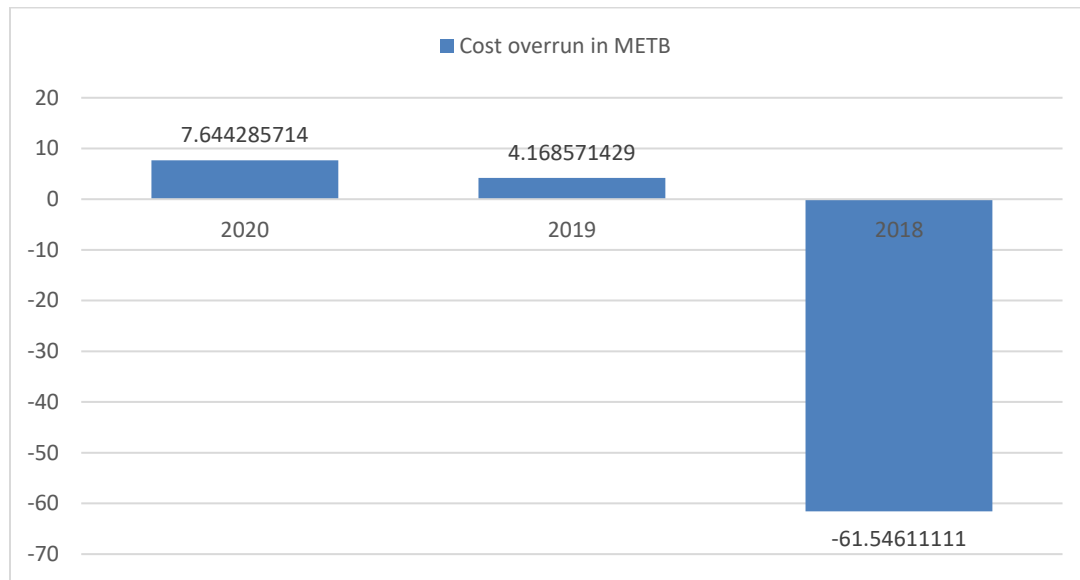
Table 4. 2 Average Original and Revised Contract amount of Foreign contractors.

Year	Average Original contract amount (METB)	Average Revised contract amount (METB)	Cost overrun (METB)	Cost overrun (%)
2020	1071.426	1079.07	7.644	0.7
2019	1571.521	1575.69	4.169	0.3
2018	942.8978	881.3517	-61.546	-6.5
2017	-	-		-
2016	-	-		-

source: Researcher's analysis based on ERA records, (2021)

The data shows that there is a variation in original contract amount. Most of federal road projects executed by foreign contractors do not finish the project on budget but some finishes below budget, of the selected federal road projects executed by foreign contractors during the last 5 years. Though the data is not complete for 2017 and 2016, but the average original contract amount in 2018 was 942.8978 METB and the average revised contract amount was 881.3517 METB, the average original contract amount in 2019 was 1571.521METB and the average revised contract amount in was 1575.69 METB.

Figure 4. 2 Cost overrun of Ethiopian federal road projects of Foreign contractors.



source: Researcher's analysis based on ERA records, (2021)

During the last 5 years **Cost overrun** of federal road projects executed in Ethiopia, of some projects executed by foreign contractors have not been completed on the original contract amount. some projects take additional budget to complete the project and some just finished below the expected budget.

4.2.3 Cost Overrun of Domestic Vs Foreign Contractors

Most of the federal road projects executed by domestic and foreign contractors have not been completed on time. Of the selected federal road projects executed by domestic and foreign contractors during the past years, it shows that it takes additional costs to finish the project.

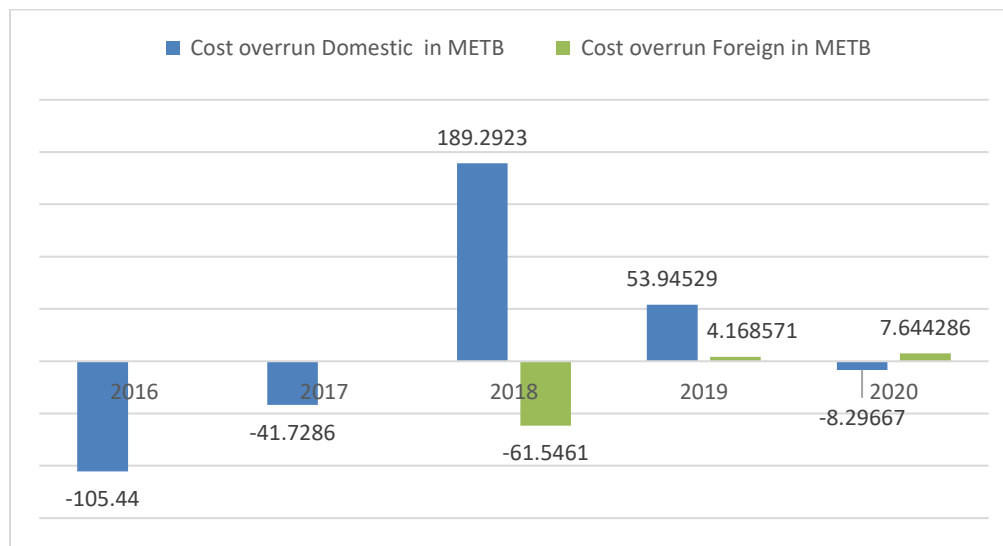
Table 4. 3: Average Cost overrun of domestic and foreign contractors.

Year	Average domestic contractors Cost overrun in METB	Average foreign contractors Cost overrun in METB	Average domestic contractors Cost overrun (%)	Average foreign contractors Cost overrun (%)
2016	-105.44		-19.4643	
2017	-41.7286		-4.71065	
2018	189.2923	-61.5461	45.2741	-6.52734
2019	53.94529	4.168571	10.30621	0.265257
2020	-8.29667	7.644286	-1.47878	0.713469

source: Researcher's analysis based on ERA records, (2021)

45% of the selected Federal road projects executed by domestic contractors have cost overrun during the construction whereas 6% of the selected Federal road projects executed by foreign contractors have performed under original contract amount in the same year. The amount cost overrun on average in projects executed by domestics' contractors was 10%; whereas in 2019 projects executed by foreign was 0.26%. The average cost overrun in projects during the past years is shown above in table 4.3.

Figure 4. 3 Cost overrun comparison between domestic and foreign contractors.



source: Researcher's analysis based on ERA records, (2021)

Tables 4.1 and 4.2 clearly illustrate whether the overall cost of projects awarded to domestic contractors was less than or more than the total cost of projects granted to foreign contractors. The amount of overall contract expense, which is a measure of project size, has been higher for foreign contractors than for domestic contractors. Though the monetary worth of contracts performed by domestic and foreign contractors in the table above shown the total cost of projects awarded to local and foreign contractors has nearly doubled continuously over the research period. The number of projects awarded to domestic contractors, on the other hand, was higher than those allocated to foreign contractors, as previously stated in RSDP. The explanation is easy to understand. Local contractors would prefer to work on lower contract price projects for a variety of reasons, including ineligibility and capability issues. To put it another way, it is thought that taking on or constructing large projects increases a contractor's capacity to take on larger projects. Also, as it can see on figure 4.3 domestic contractors have more cost overrun than foreign contractors even though the projects are smaller in value. In 2019 the average domestic contractor's cost overrun is 189.2923METB whereas foreign contractors 61.5461 METB.

Cost overrun determinants, according to the literature Material cost inflation, scope changes with change orders, incomplete studies prior to project approval, poor specification/or bill of quantity and design, poor project performance monitoring, currency

shortages for importing construction inputs, depreciation of the Ethiopian Birr's value, and financial resource shortages are some of the issues that arise, and late clearance.

In last five years RSDP V physical plan was 114,846 km and only 40,665.4 km was accomplished 35% of total plan was used. with 334,514.4 METB financial plan and only 196,050.98 METB disbursement 59% of financial plan was used. So, this means that, despite the program's negative impact on construction, the domestic construction industry's capacity is encouraging. The local construction industry's participation in the RSDP has expanded in terms of both value and quantity of projects over the last twenty-three years. However, because domestic contractors' cost overruns are higher than foreign contractors', it is preferable to focus on capacity construction and strong governance in order to achieve better performance and, at the very least, be competitive with foreign contractors.

4.3 Time Performance

This section presented, discussed, and analyzed time performance of domestic contractors, time performance of foreign contractors with respect to Average planned and actual/expected completion period. And compare time overrun of domestic vs foreign.

4.3.1 Time Performance of Domestic Contractors.

Most federal road projects contracted to domestic contractors have fallen behind schedule. It is clear from the selected federal road projects completed by domestic contractors during the last 5 years that the project takes longer to complete. In 2016, the average actual completion period was 1604 days, compared to 1095 days for planned completion; in 2017, the average actual completion period was 1646 days, compared to 1095 days for planned completion. Table 4.4 shows the average time overrun in projects over the last five years.

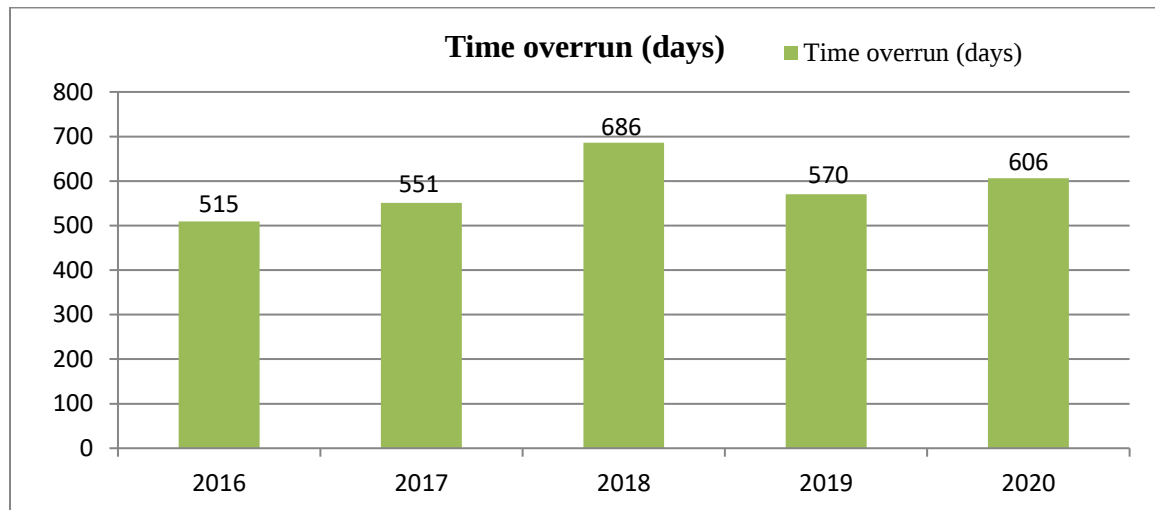
Table 4. 4 Average planned and actual/expected completion period of domestic contractors.

Year	Average planned completion period (days)	Average actual/expected completion period (days)	Time overrun (days)	Time overrun (%)
2016	1095	1610	515	47
2017	1095	1646	551	50
2018	889	1575	686	77
2019	945	1515	570	60
2020	842	1448	606	72

Source: Researcher's analysis based on ERA records, (2021)

The data indicates that the planned completion date and the actual/expected completion period differ. The majority of federal road projects that are completed by domestic contractors are late. It is clear from the selected federal road projects completed by domestic contractors during the last 5 years that the project takes longer to complete. The average real completion time in 2016 was 47 percent longer than the average expected completion time. In 2017, the real completion period is 50% longer than the expected completion period. Table 4.4 shows a comparison of the expected completion date and the real completion period of selected federal road projects completed by domestic contractors over the last 5 years.

Figure 4. 4 Delays of federal road projects by domestic contractors



Source: Researcher's analysis based on ERA records, (2021)

Delay of Federal Road Projects; Most federal road projects in Ethiopia have not been completed in the allocated time over the last five years. The projects would take longer to complete. Figure 4.8 shows the time overrun of selected federal road projects completed by domestic contractors over the last five years.

4.3.2 Time performance of Foreign Contractors.

It is measured whether there is a delay during the construction of federal road projects, just as it is for domestic contractors, and many projects completed by foreign contractors have not been completed on time. Most federal road projects contracted to foreign contractors have fallen behind schedule. It is clear from the selected federal road projects completed by foreign contractors in recent years that the project takes longer to complete. In 2018, the average actual completion period was 1896 days, compared to 1279 days for planned completion; in 2019, the average actual completion period was 1190 days, compared to 873 days for planned completion. Table 4.5 shows the average time overrun in projects over the last few years.

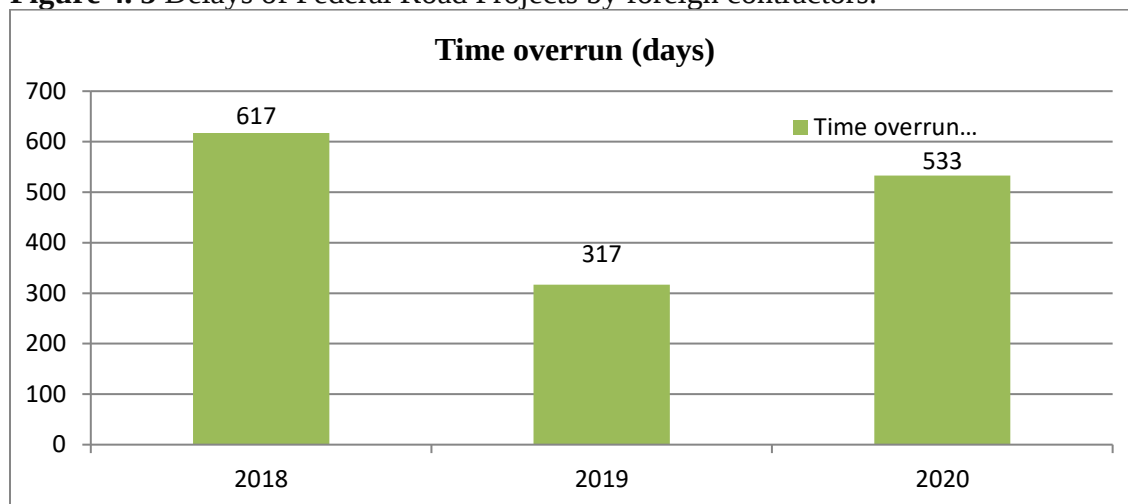
Table 4. 5 Average planned and actual/expected completion period of foreign contractors.

Year	Average Planned completion period (days)	Average actual/expected completion period (days)	Time overrun (%)
2018	1279	1896	48
2019	873	1190	36
2020	993	1526	54

Source: Researcher's analysis based on ERA records, (2021)

The data indicates that the planned completion date and the actual/expected completion period differ. Any federal road projects that are completed by foreign contractors are not completed on schedule. It is clear from the selected federal road projects completed by foreign contractors in recent years that the project takes longer to complete. In 2018, the average actual completion time was 48 percent longer than the average expected completion period. In 2019, the actual completion period is 36 percent longer than the expected completion period. Table 4.5 shows a comparison of the expected completion period and the actual completion period of selected federal road projects completed by foreign contractors during the last few years.

Figure 4. 5 Delays of Federal Road Projects by foreign contractors.



Source: Researcher's analysis based on ERA records, (2021)

Delay of Federal Road Projects; Much of the federal road projects that have been completed in Ethiopia in recent years have not been completed on time. The projects would take longer to complete. Figure 4.5 depicts the time overruns on selected federal road projects completed by foreign contractors in recent years. In 2019 the average projects delayed 317 days, in 2020 the average projects delayed for 533 days.

4.3.3 Time Overrun of Domestic Vs Foreign Contractors

Most of the federal road projects executed in Ethiopia have not been completed on time. Of the selected federal road projects executed by domestic and foreign contractors during the past years, it shows that it takes additional days to finish the project.

Table 4. 6 Time overrun comparison between domestic and foreign contractors

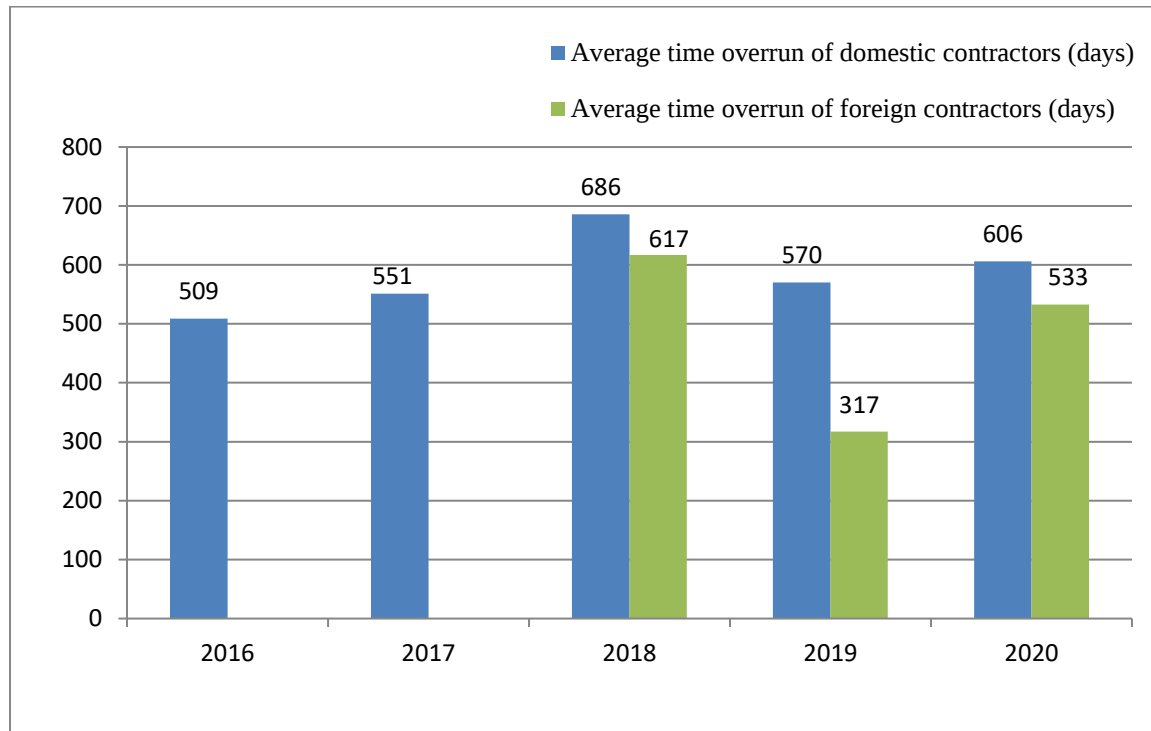
Year	Average domestic contractors time overrun (days)	Average foreign contractors time overrun (days)	Average domestic contractors time overrun (%)	Average foreign contractors time overrun (%)
2016	509		47%	
2017	551		50%	
2018	686	617	80%	48%
2019	570	317	59%	35%
2020	606	533	84%	53%

Source: Researcher's analysis based on ERA records, (2021)

80% of the selected Federal road projects executed by domestic contractors have delay during the construction whereas 48% of the selected Federal road projects executed by foreign contractors have delay in the same year. The amount of extension of time on average in projects executed by domestics' contractors was 48% ; whereas in projects

executed by foreign was 80% the average contract time overrun for both contractors is shown in above table 4.6.

Figure 4. 6 Project Time overrun of domestic and foreign contractors.



Source: Researcher's analysis based on ERA records, (2021)

Both foreign and domestic contractors have a time overrun though the time overrun by foreign contractors is lesser than that of domestic. as we can see in 2018 the average domestic contractor's time overrun is 686 days whereas in foreign contractors 617, in 2019 the average domestic contractor's time overrun is 570 days whereas in foreign contractors 317. The average time overrun in projects during the past five years is shown in the above figure 4.6. as discussed above the contract amount increases, the time and cost overrun also increase.

According to the data, the majority of federal road projects completed by domestic contractors are significantly delayed. During the last five years, local contractors have averaged a 64 percent time overrun. Similarly, an average of 45% time overrun by foreign contractor. the performance of foreign firms though better than locals has not also up to the expectation raising questions about the work environment in the country. There are sizable

federal road projects executed by foreign contractors which have not been completed on time.

As stated in literature time overrun caused by Poor managerial skills, indecisiveness, inexperienced labor force, and a lack of good planning are just a few of the factors that contribute to the delay. Right of way issues, such as late site handover after contract award and premature settlement of right of way issues, as well as shortages of construction inputs, which mostly entail importation, all contribute to time overrun. Contractors, on the other hand, cite design and change orders due to poor designs, design change and modification, delay in approval of updated designs, and constant new extra work orders as major reasons.

But as discussed in RSDP reports the amount of projects given to domestic contractors is greater in number than foreign contractors but the size of the project is smaller, it is clear to see the amount of contracted costs of the project as discussed above, the larger the cost the complex it gets but still the domestic contractors face more time overrun than foreign contractors.

4.4 Quality Performance

This section presented, discussed, and analyzed retention money, quality performance of domestic and foreign contractors with respect to Calibration of equipment used to carry out different tests, Quality of material used for construction, Site administration records/documentation, Progress of the works, Environmental, Social, Safeguards and safety issues, and other cross-cutting issues. The principal sources of information are found from quality audit reports, then focused group discussion to support the finding of document reviewed and semi structured interview with engineers working in ERA Performance quality and system management.

4.4.1 Retention Money

As discussed, previously the Purpose of retention money conveys the value of completing the signed project according to its terms and specifications. To obtain the retention money withheld, the contractor must complete the scope of work under his contract. This is how the employer(client) is shielded from the money he spends in improvement claims per month. With such a retention in place, the contractor assumes responsibility for completing

the construction project according to the design and quality specifications specified in the initial contract.

In most construction contracts, the Defects Liability duration is 12 months, during which time the contractor is responsible for correcting any defects that occur because of poor workmanship. The second half of the Retention Money will be released once the Maintenance Certificate is issued. Contractors in charge of ERA projects, on the other hand, claim their retention money earlier of time by repairing defects for a quick release of the retention money and also to keep their reputation.

The client holds the retention money just for the sake of formality they will just hand it to the contractor when the contractor claims almost all of projects executed in Ethiopia will face defects and the contractors will just make fix it fast just to get back the retention money.

4.4.2 Quality performance of domestic contractor

From the reviewed documents, the following points are taken as an indicators of quality performance for the projects. Structural evaluation, material evaluation, hydrological, safety, environmental and health evaluation, and documentation. Most of projects executed by domestic contractors perform under the specification on the contract. As a result, most of all major testing machines/ equipment have been calibrated, when checked certificate of calibration as it is a requirement by ERA to calibrate laboratory equipment and machines on annual/yearly bases.

In most of the projects the drainage structures on the site have been installed without sufficient crossing structures or a runoff which is not properly managed that may cause disaster to the road embankment, the crossing structure and to the adjacent area, as well as an over design structure incur unnecessary cost. but in most of projects the overall quality of structures for project is very good, except minor defect that should be corrected during construction.

The workers' safety in most of projects executed by domestic contractors have not been maintained. there is no personal protective equipment (PPE) given for the workers on construction site. Workmen are engaged in hazardous conditions through the project

activities of health and safety, Exposures to dust inhalation, other wastes, sharp metals, falls, rocks fall, head injuries, etc.... could have been addressed with provision of proper PPE.

Due attention is not being given for the subject of construction environment health and safety for the project. different health and safety concerns are noticed throughout the project raising from different reasons, such as, poor signage provision and management, no waste management in place, no safety awareness / trainings to employees, no isolation of hazardous activities, no provision of PPE, etc. Waste from the workshop of all types including hazardous wastes of lubricants and oil.

The staff accommodation in most of the projects contracted to domestic contractors have not been fulfilled as per the binding contract agreement, housing facilities are not fully furnished. And the quality of materials used for construction does not comply with the standard specification. In relation with this, the contractors are not providing separate Laboratory at construction site and hence quality tests are conducted at Engineer's site Laboratory. The Engineer's Laboratory found at site are not fully equipped as per the contract. Performance of contractors on the site mostly Poor workmanship. The data recording and handling process is very poor/unhealthy.

4.4.3 Quality performance of foreign contractors

Most of projects have checked certificate of calibration as it is a requirement by ERA to calibrate laboratory equipment and machines on annual/yearly bases. Accordingly, almost all major testing machines/ equipment have been calibrated for the year. Most of the drainage structures on the site are properly installed but some of the drainages lack Scouring of backfill material and Proper channelization and clearing on all pipe and Box Culverts even it is designed as per the specification.

workers' safety has been maintained on most of projects executed by foreign construction site, Workers were equipped with safety material like reflector vest. Therefore, safety equipment like; hard hat (helmet) and safety shoes should be provided for any person entitled to be on the sites, so as to prevent any accident risks and injuries due to the project work sites as specified in the contract. Specially, for those who works under falling objects, machinery, on steel and reinforcement. contractors maintained the construction environment safe and healthy, there are a temporary traffic

signs, diversion signs and workers with safety and traffic management plan is implemented on the project site. Quarry sites were not properly closed, and waste disposals managed in proper way.

Most of the staff accommodation have been fulfilled as per the binding contract agreement. the contractor kept the quality and serviceability of Engineer's Camp Employer Representative Houses and facilities have been completed and the housing facility is furnished. The laboratory equipment's are placed in the laboratory construction at contractor camps. and the ER office is within the same compound as contractor staff as specified in the contract, contractor has established first aid clinic at the construction camp. The quality of materials used for construction comply with the standard specification. Subbase, sub grade and borrow pit, In most of the tests performed, core thickness and air void and other materials checked, and most are within the range of specification requirement. riding quality of the already completed pavement was good.

The data recording and handling process was fair in most of projects. Documentation is vital in auditing the project, to check whether the required scope has been met. It can be also used as reference to ensure the success of other future projects. Project records indicate that, all materials incorporated into the works are in reasonably close conformance with the specification requirements.

CHAPTER FIVE

5 SUMMERY, CONCLUTION AND RECOMMENDATION

5.1 Introduction

This chapter is divided into three sections. The study's main findings were summarized in the first section. The second section discussed the general conclusions reached as a result of the findings, and the third section made recommendations to the relevant bodies.

5.2 Summary of Major Findings

This chapter summarizes the findings of the Ethiopian road construction industry performance regarding cost, time and quality of domestic and foreign contractors from 2016 to 2020 analysis. The study would not only look at the level of efficiency, but it would also point out elements that would help the industry boost its performance and, in turn, become more competitive. According to the collected data through progress reports of projects from ERA, FGD and semi structured interview the study revealed the following results.

- Among the results from selected federal road projects executed by domestic contractors during the last 5 years, most projects did not finish the project on budget. During the last 5 years Cost overrun of federal road projects executed in Ethiopia, of some projects executed by local contractors have not been completed on the original contract amount. some projects take additional budget to complete the project and some just finished below the expected budget. On the other hand, of the selected federal road projects executed by foreign contractors during the last 3 years, most of federal road projects executed by foreign contractors did not finish the project on budget but some finishes below budget. Cost overrun of federal road projects executed in Ethiopia, of some projects executed by foreign contractors have not been completed on the original contract amount. some projects take additional budget to complete the project and some just finished below the expected budget.
- The amount of overall contract expense, which is a measure of project size, has been higher for foreign contractors than for domestic contractors. average original

contract amount for foreign 1071.426 METB as the revised was 1079.07 METB, average original contract amount for domestic was 561.048 METB as the revised was 552.7513 METB. And also 45% of the selected Federal road projects executed by domestic contractors have cost overrun during the construction whereas 6% of the selected Federal road projects executed by foreign contractors have performed under original contract amount in the same year. The amount cost overrun on average in projects executed by domestics' contractors was 10%; whereas in 2019 projects executed by foreign was 0.26%.

- The data indicates that the planned completion date and the actual/expected completion period differ. The majority of government road projects carried out by domestic contractors did not finish the project on time. It is clear from the selected federal road projects completed by domestic contractors during the last 5 years that the project takes longer to complete. On the other hand, majority of federal road projects contracted to foreign contractors have fallen behind schedule. It is clear from the selected federal road projects completed by foreign contractors in recent years that the project takes longer to complete. Delay of Federal Road Projects; Much of the federal road projects that have been completed in Ethiopia in recent years have not been completed on time. The projects would take longer to complete.
- Most of the federal road projects executed in Ethiopia have not been completed on time. of the selected federal road projects executed by domestic and foreign contractors during the past years, it shows that it takes additional days to finish the project. 80% of the selected Federal road projects executed by domestic contractors have delay during the construction whereas 48% of the selected Federal road projects executed by foreign contractors have delay in the same year. The amount of extension of time on average in projects executed by domestics' contractors was 78.71%; whereas in projects executed by foreign was 33.22%.
- There were an insufficient way of tracking and documenting quality performance. But the study tries to see quality based on Hydrological Evaluation, Structural Engineering Evaluation, Material Evaluation, Environmental Evaluation through document review, focus group discussion and semi structured interview. Equipment should be calibrated so that the required results are found from the test,

install drainage structure based on the specification, Possible remedial measure shall be taken on observed defects/cracks, All quarries, borrow pits, diversions and detours shall be filled and landscaped, as far as practical to their original condition after extraction of construction material. Safety and accommodation of staff for a better performance.

- Most of federal road projects executed in Ethiopia have not been completed as the agreed in contract quality specifications. Based on the indicators listed above most of projects executed by foreign contractors are more compatible than domestic contractors. material testing equipment's calibrated on time in foreign than domestics. the drainage structures on the site are properly installed in case of foreign but domestics have poor performance, workers safety is fair, but the domestic contractors have poor performance. Domestic contractor shall give attention on the quality of formwork.
- Foreign contractors all laboratory equipment inspection forms and their calibration date were reviewed and calibrated, The records of test results were checked and found that, the material test results conducted by the contractor and consult is within the requirements of the technical specification, QA/QC, Environmental Management Plan (EMP), Traffic Management Plan (TMP) was submitted and, Compaction and gradation tests were inspected and found to be adequate in frequency and within technical specification requirement, RFI document was inspected and include, as built, test result and signed as outlined in the form as accepted, rejected and not done.
- Domestic contractor's project's progress is evaluated to be very slow against the time Elapsed to Most of the executed structures are substandard, Material quality, rebar storage and field density. Side slope and excavation are not going safely. The Engineer's facility (Specifically Guest House) is not to the required level. Among the Laboratory Equipment most are not calibrated, Project records like minutes of meeting and RFI (request for inspection) are not fully available. First Aid Facility is not provided. The Environmental and safety issues aren't handled by the Contractor as specified in the Contract, Landscaping and Preservation activities are not commenced on time. The Contractor's traffic management is not as expected.

The sanitation issue that the contractor is failed to avoid spillage of oil and Lubricants, The Contractor is seen spoiling the excavated materials along the main roadside.

5.3 Conclusions

Ethiopia's domestic construction sector, without a doubt, has various challenges that limit its competitiveness in contrast to foreign contractors. According to the findings of the research and discussion, the domestic construction industry's competitiveness in terms of performance remains much lower than that of its foreign equivalents, even though it is gradually improving. It is not necessary to conduct a worldwide indexing exercise to see that the sector is hampered by structural limitations in management, technology, skills, money, and working culture. Stakeholders acknowledge how tough it is to overcome these obstacles. Nonetheless, they are at odds. If there is one, It is in the scale of the potential impact on the industry's competitiveness. As a result, the construction industry in Ethiopia will undergo a lengthy and challenging adjustment.

Because it has such a large impact on cost, project completion is the most crucial metric of project success. Delays are one of the most severe problems that construction firms face. It could lead to several other negative outcomes, including owner-contractor litigation, higher costs, lost sales, and contract termination. Large capital construction projects are plagued by unjustified cost overruns, delays, and lost productivity. Changes in scope, design flaws, omissions, a lack of adequate planning and scheduling, and poor tool, equipment, material, and labor management have all been characterized by many researchers and practitioners as contributing to poor results.

Due to their level of competitiveness in the road construction industry, domestic contractors are completing very few mega construction projects in Ethiopia. It is clear to see Foreign contractors have a far greater average contract capital per project than domestic contractors. This was due to the fact that foreign contractors were mostly involved in larger, more sophisticated projects that required a lot of money and knowledge. The average contract value for domestic contractors has increased slightly as well, although it is still not as huge or as high as the value of contracts for international contractors. Domestic contractors often outnumber foreign contractors in terms of contract numbers. This may

indicate that domestic contractors would ultimately be willing to take on larger projects, implying that domestic contractors' competitiveness will improve in the coming years.

Domestic contractors make the mistake of believing that they can expand by signing more and more contracts with lower contract rates without considering the costs of fulfilling their contractual obligations. Low bid submissions are bad for business because they don't create any profit, and it also affects the firm's ability to produce the product on time and according to the budget. The rise in the average contract value per project for domestic contractors could mean that the domestic contractors' capacity to take on larger contracts has grown. Domestic contractors, on the other hand, have a very low average contract value per project as compared to foreign contractors. This may be a sign that domestic contractors have begun to take on larger projects. This is plausible because domestic contractors gain experience, expertise, and knowledge over time. It may also be that their money grows as they complete more projects.

Quality performance of domestic and foreign contractors was reviewed based on hydrological evaluation, structural engineering evaluation, material evaluation, safety and health and environmental evaluation if they perform upon agreed specifications. The majority of projects completed by foreign contractors, despite time and cost overruns, are of higher quality than those completed by local contractors for various reasons. Rather, projects completed by domestic contractors have a lower quality performance than projects completed by foreign contractors, although this does not apply to all domestic companies. In today's world, there are certain great contractors who outperform even overseas foreign contractors.

5.4 Recommendations

This study as compared to other research, made efforts to show that comparative performance using chosen performance measures which are Cost, time, and quality in local and foreign contractor's context. they are all intertwined, and any change in one has an impact on the others. Simply finishing the project on time and on budget isn't enough; the project must also be of acceptable quality.

Local road construction firms operate in a challenging business climate. Establishing positive relationships with a variety of partners, including clients, government regulatory authorities, consultants, financial institutions, subcontractors, and suppliers, is critical. Contractors having solid relationships with these parties have greater opportunity to secure construction contracts and increase their construction efficiency.

To improve their competitiveness, in addition to cost, time and quality perspective, Local construction firms (LCFs) must be aware of and understand the external elements that affect their ability to compete. This aids them in improving their competitiveness and developing competitive strategic dimensions in order to fulfill the demands of a changing business environment and their clients.

Construction companies' ability to use internal resources such as human resources, finance, equipment and plant, marketing information, technology, and others is encouraged because it gives contractors a competitive advantage. Allocating and effectively utilizing such resources enables them to accomplish many client objectives, such as completing projects on schedule, under budget, and to specified quality standards.

its recommended participation of both the construction industry and the government in enhancing the competitiveness of the sector in reality, a comprehensive definition of competitiveness considers the interests of firms, clients, governments, and society as a whole, in addition to traditional performance measures. From a government standpoint, a variety of measures have an impact on better performance and efficiency.

Government policies must encourage improvements in education, competitiveness, innovation, technology, and enterprise, all of which will help the economy operate better. And finally, it is recommended for client organization in this case ERA, to keep track of contractors record both domestic and foreign and store on a working software ERAMS effectively. So as to have a clear document to understanding on how they are performing.

5.4.1 Areas of further study

Conducting a competitiveness analysis at the firm level, which comprises three main parties: the client, the consultant, and the contractors. Furthermore, this research only showed competitiveness with respect to project performance indicators cost, time and quality but competitiveness can be seen from different perspectives. In addition, it is interesting to see perspective of quality performance from consultants' side in detail to come up with better and accurate results. Future research should also focus on the industry level, considering other construction sectors such as construction, water works, hydropower, irrigation, and others, to provide a holistic picture of industrial competitiveness and make strategic recommendations.

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APPENDIX A
Semi Structured Interview

1. How is the client holding/releasing the retention money?
2. How do you see Progress of Works and Construction Quality of work completed and work in progress?
3. How do you see performance of domestic contractors compared to foreign contractors?

APPENDIX B
Focus Group Discussion Points

1. Is all material testing equipment's calibrated on time?
2. Were the drainage structures on the site properly installed?
3. Has the workers' safety been maintained on construction site?
4. Has the contractor maintained the construction environment safe and healthy?
5. Has the staff accommodation been fulfilled as per the binding contract agreement?
6. Does the quality of materials used for construction comply with the standard specification?
7. What Contractor's Performance looks like on the Site?
8. Is the data recording and handling process healthy?