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ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE
MBA PROGRAM

**DETERMINANTS OF PROJECT COST OVERRUN FOR THE CASE OF
OVID CONSTRUCTION IN THE CONSTRUCTION OF FEDERAL
HOUSING PROJECT AT GERJI SITE**

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**A Thesis Submitted to the College of Business and Economics Department of
Accounting and Finance, in partial fulfilment of requirements for the Degree of
Masters of Art in Business Administration (MBA in Finance)**

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ADDIS ABABA, ETHIOPIA

DECLARATION

I Martha Alene, do hereby declare that this thesis entitled Determinants of project cost overrun for the case of OVID construction in the construction of federal housing project at Gerji site is my original work, prepared under the guidance of Sewale Abate (PhD) and that it has not been submitted partially; or in full, by any other person for an award of a degree in any other university/institution. Each and every source of information used in this thesis has been properly recognized through citation.

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Signature.....

Date.....

This Thesis has been submitted for examination with my approval as college supervisor.

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APPROVAL

The undersigned certify that we have read and hereby recommend to the Addis Ababa University to accept the Thesis submitted by Martha Alene, entitled "Determinants of Project Cost Overrun for the case of OVID Construction in the construction of Federal Housing Project at Gerji Site", in partial fulfilment of the requirements for the award of a master's degree in business administration.

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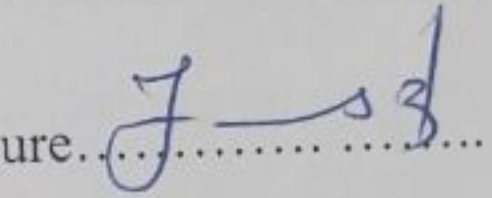
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ABSTRACT

To reap the benefits of the contribution of construction, the industry needs to be handled to avoid delays, cost overruns, or issues regarding quality. Most of the housing projects face one of the main problems which is cost overrun during their project life cycle. Thus, this research aims to examine the housing project constructed by OVID Construction for Federal housing corporation project at Gerji site on the causes that contribute to cost overrun. In order to achieve the research objectives, this research targets the participants in the project. The target population of this study is the head quarter office found at Addis Ababa, and their respective managerial staffs and employees. There are over 300 permanent employees on the 4 sites 93 directly related to housing projects and 115 employees that are not directly related to housing projects constructed by OVID construction. In this study, all directly related to housing project employees were selected. The sample represents all parties involved in the housing project. The correlation analysis revealed a strong positive relationship between the external environment and project cost overrun, with a correlation coefficient of 0.951. In comparison, the influence of the client, consultant, and contractor on the project cost overrun had lower correlation coefficients: 0.716, 0.799, and 0.498, respectively. The results indicate that these four factors, External, client, consultant and contractor related factors account for 94.4% of the adjusted R square value which suggests that 94.4% of cost overruns can be explained by variation in these four predictors alone. it is vital for OVID Construction management to be aware of the potential for cost overruns in their projects and take proactive measures to mitigate the impact of these factors.

Key Words: OVID Construction, Cost Overrun, Housing Project, Client Factor, Contractor Factor, Consultant Factor, External Factor

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Construction is broadly defined as an economic activity focused on the creation, renovation, repair, or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, etc. in accordance with the UN, 1996 Standards Industrial Classification (ISIC), Rev. 3.

A nation's socioeconomic development process benefits greatly from the contributions of the construction industry. Approximately 6% of the global GDP is generated by the construction business, which has a significant impact on society, the environment, and the economy globally. (World Economic Forum, 2016).

Regretfully, research indicates that it is becoming frequent for the majority of construction projects to not be finished on time, within budget, or to the required quality. Construction project cost performance is usually defined as a cost variance against a baseline. Measuring the construction cost variance is essential to assessing the project's viability and, consequently, to understand the financial risks associated with project execution. (Devi & Anantha Narayanan 2017).

Several factors can lead to a major cost overrun in construction. These include additional work orders, changes in the project's scope, cash flow issues, contractors' financial struggles, delays in decision-making, poor planning, frequent design modifications, a lack of coordination between parties, the practice of awarding least bidder, imprecise time and cost estimates, design flaws and omitted items, wrong quantity take-off calculations, and the inexperience of the contractors on the project. (Almaktari et al., 2017, Taye,2016, Zinabu & Getachew,2015 and Bekr,2015).

In consequence, cost overrun has considerable effect on all construction project participants and owners (Davi et. al, 2017). Cost overruns can affect the three construction parties in such a way that: for the client, the consultant, and the contractors; for the consultant, they indicate an inability to get value for the money and in a loss of client confidence; for the contractor, they indicate a loss of profit due to non-completion and potential for defamation, which could impede

future job opportunities; and for the construction industry, they cause banks and lenders to lose faith in financing construction projects because of the increased risk involved. (Taye,2016).

Both developed and developing countries these days struggle with controlling the risk of cost overruns and finishing projects within budget. This is because cost overruns might make it impossible to complete projects within the allocated budget (Saidu & Shakantu, 2017).

Ethiopia has one of the fastest expanding economies in Africa, and the construction sector plays a significant role in the country's economy (EEA, 2008). In Ethiopia, the construction sector provides opportunities for the expansion of numerous other businesses. Construction projects demand a lot of input. For example, they need different materials, cement, and cement products, among other metal products. Therefore, the expansion of these sectors will undoubtedly coincide with the construction sector's growth. Similar to this, when more homes were built or renovated, there was an increase in demand for furniture for the home, which in turn led to an increase in the furniture manufacturing industry's expansion. In Ethiopia, as in the rest of the globe, the construction industry helps to realize almost half of the total capital (<http://www.abysinialaw.com>, accessed on October 2, 2018).

Additionally, in terms of government infrastructure development, public construction projects use the largest portion of the government's yearly capital budget (Ministry of Construction, 2016). In Ethiopia, the construction industry has contributed for the development more than any other sector. It has been instrumental in sustaining the nation's rapid and equitable socio-economic development and in improving the lives of millions of people. As of 2016, the sector accounted for 9.5 percent of Ethiopia's total Gross Domestic Product. Ethiopia aimed to become a middle-income country by 2025, and a large part of that goal would depend on having a strong and competitive local construction industry (www.allafrica.com). The industry is growing, as seen by the amount of public building construction projects that are being undertaken by the Ethiopian government is increasing with time.

Cost overruns, however, are a frequent occurrence on the majority of public construction projects and are seen as a very serious issue (ECIDP, 2014). According to Devi & Ananthanarayanan (2017), project cost overruns have a detrimental effect on both profitability and the economy. For this reason, this research aims to enhance current construction performance by identifying the main causes of construction cost overruns as the project progresses.

1.2. Statement of the Problem

A strong construction sector has an immense effect on how a country's economy develops. Over the past few years, the construction industry has expanded in size, complexity, and market demand; as a result, the industry now faces greater challenges in completing projects on schedule and under budget (Rahel Kassaye, 2016).

Quality, timeliness, and budget are the three factors that must all be considered while planning a construction project (Lester, 2013). When a project is finished and meets the predetermined standards for time, money, and quality while satisfying the client, these are the main indicators that the project is successful. Notwithstanding extensive training and access to recent technologies in project management, project cost overruns remain a prevalent worldwide problem in the majority of building projects (Memon, 2013). The study demonstrates that, among other things, political unrest has an impact on cost overruns in construction projects in Yemen. The causes for delay & cost overrun in construction projects in Australia, Malaysia and Ghana showed, delay factors are greatly varied from one country to another country. (Hong, Nzige, and Almaktari 2017).

KPMG International's Global Construction Survey 2015 reported that the cost overrun is a persistent problem and is bothering all nations and continents. 72% of projects are delayed on average of which 38% longer than the original contract period, and 63% of projects have faced cost overruns and out of these 24% rise in the initial agreed price, with rework as an additional aspect that affects productivity and contributes to a 6% rise in project expenses overall.

According to a survey, half of the sixteen government-financed construction projects in Ethiopia had gone over budget and delayed schedule. Ethiopian Construction Sector Transparency Initiative (CoST)(2014). The top five factors that cause construction project cost overruns have been determined by the private construction industry in Ethiopia. These elements, which are mentioned in descending order, include poor planning, unstable material costs, low productivity, inflationary pressure, and issues with project funding Zinabu & Getachew (2015).

An initial discussion with the senior management of OVID Construction's Building Technology & Construction division has indicated that a significant cost overrun is occurring in one of the

company's ongoing large-scale house construction projects; the specific causes of this are unknown. Thus, the purpose of this study is to evaluate and prioritize the causes that led to construction cost overruns in housing development projects. Project cost overruns are a common problem in the construction industry, especially for large-scale projects such as the Federal Housing Project at Gerji Site being undertaken by Ovid Construction. This project has been identified as a unique gap to study due to its complexity and scope.

The first step towards understanding this issue is to identify potential causes that can lead to cost overruns on this particular project. Some of these may include inadequate budgeting, unexpected delays or changes in materials costs due to fluctuations in market prices, and poor management decisions made during various stages of planning and execution.

By further examining these factors more closely through quantitative analysis and interviews with key stakeholders involved on both sides (Ovid Construction employees/management team members & representatives from Federal Housing Agency), we can gain valuable insights into what specific actions need taken order reduce future risks associated with similar projects going forward while helping prevent costly mistakes from occurring again down line when tackling even more complex challenges ahead . Ultimately, doing so will not only help minimize financial losses but also improve efficiency levels within organization overall so they better equipped to handle whatever comes their way next without having worry about same issues.

The project was in Ethiopia, which has its own unique cultural, political, and economic context that may have influenced the construction project and its outcome. Studying the project cost overruns within this cultural and socioeconomic context could provide insights into the challenges of conducting construction projects in developing countries.

The Federal Housing Project at Gerji Site was a large-scale housing project, which may present unique challenges compared to other types of construction projects such as commercial buildings or infrastructure projects. Additionally, the fact that the project was federally funded could have added additional layers of complexity to the project management process.

There are a few potential factors that could make the study of project cost overruns for the case of Ovid Construction in the construction of the Federal Housing Project at Gerji Site unique. By taking into account these and other unique factors that may have influenced the construction project, a study of project cost overruns for the Federal Housing Project at Gerji Site could provide valuable insights for future construction projects and project management practices.

Finally, studying the project cost overruns for Ovid Construction in particular could provide insights into the company's management practices, construction processes, and risk management strategies. This could potentially be useful for identifying areas of strength and weakness for the company, as well as best practices that could be shared with other construction firms.

1.3. Research Questions

- What factors lead to cost overruns in housing projects?
- Who are the responsible parties for the cost overrun in housing construction projects?
- What mitigation measures should be taken in housing construction projects?

1.4. Objectives of the Study

The general objective of the study was to examine the OVID Construction company on the causes that contributes to cost overrun and recommendations to minimize or to avoid cost overrun thereby make prior corrective action for the future projects.

Specific objectives of the study are:

- To examine the leading causes of cost overrun in the OVID Construction housing construction projects and to rank them by the degree of relative importance.
- To investigate the responsible parties to the causes of construction cost overrun.
- To study the top mitigation measures of cost overrun in the OVID Construction housing construction projects and to rank them by the degree of relative importance.

1.5. Significance of the Study

A project is considered successful when it meets the predetermined standards for time, money, and quality and the client is satisfied. These are the main success factors. Therefore, in order to finish a project within the allocated budget. The main goal of this study is to provide information to individuals who play a significant part in the start, planning, and implementation of housing building projects regarding the elements contributing to cost overrun. Additionally, a mitigating technique for the cost overrun elements was included in this study.

1.6. Scope of the Study

The study's scope is restricted to carrying out actual evaluations of cost overruns and mitigation measures for housing construction projects. To ensure the success of the project, it is important to prevent or avoid variables that may contribute to cost overruns, which can be caused by a variety of stakeholders in the construction sector. This study identifies different reasons for cost overruns and mitigation strategies to offer recommendations for enhancing the efficiency of housing construction projects managed by the OVID construction for the case study. However, comparable building construction projects could make use of the established principle.

1.7. Organization of the Study

This research was organized into five chapters and references. Chapter one deals with the introduction, which talks about the general idea and relevance of the study. It defines the background, the problem statement, the objectives, the scope as well as the organization of the thesis. Chapter two comprises of literature review, and quotes the various related works done in this area of study. The third chapter tries to present a comprehensive account of the project technique employed in this research.. Data presentation, analysis of the information acquired

from the data survey, a summary of the findings, a discussion, and the study's limitations are all included in the fourth chapter. The study's conclusions and suggestions are presented in the fifth chapter.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical and Conceptual Literature Review

2.1.1. Cost Overrun Definition

Any additional expenses beyond the contractual costs decided upon during the tender process are referred to as cost overruns. Cost overruns have been noted by numerous earlier studies as a global issue facing the building and construction sector. (Endut et al., 2005). In another study by Enshassi et al. (2010) cost overrun can be defined as excess of actual cost over specified budget. Cost overrun is also sometimes called “cost escalation”, or “budget overrun”. More than that, cost performance is the most significant indicator of project success. It presents not only the firm's profitability but also the productivity of organizations at any point during the construction processes. It can be seen in the project account and always used to measure project performance (Rahman et al., 2013).

In the construction project, cost overrun factors may come from various factors, for example, lack of experience of contractor, frequently changes the structure of the design, inflation of materials, improper budget planning, fluctuation in prices of materials, weather condition, poor project management and supervision. Cost overrun occurs when the final cost of the project exceeds the original contract value at the time of completion (Danso & Antwi, 2012).

2.1.2. Existing Studies of Cost Overrun Factors

Many literatures and actual projects indicate that construction cost overrun is a common problem in the construction field. Cost overrun is an occurrence in which the provision of contracted projects, service or goods are claimed to require extra financial resources than initially agreed between a project owner and a contractor. Cost overrun is defined as an increase of cost, which is not expected during estimation of the initial budget (Enshassi et al., 2010).

Many Countries around the worldwide are facing many problems on cost performance such as Malaysia, Gaza, Nigeria, Pakistan, Egypt, Greek and India. Cost overrun on a construction project is one of the major issues that describes inability to complete the project within the limited or specified cost (Rahman et al., 2013). Cost overrun is also known as cost escalation

where actual cost exceeds the approved cost or original budget for construction of the project. Unrestrained cost overrun may lead to an increase in construction cost and affect the decision-making for investment. National finance was wasted which might result in corruption or offense (Ali & Kamaruzzaman, 2010).

Cost is amongst the major considerations throughout a project management life cycle and is considered as prime factor of success. However, it is uncommon to see a project completed within the estimated cost. In today's construction industry, cost overrun is a very common phenomenon worldwide. This issue is critical and needs to be more understood and alleviated. In a study on 8000 projects, found that only 16% of the projects satisfied the three fundamental criteria of project success i.e. completing project on time, meeting the budgeted cost, and meeting quality standard, while in a global study on cost overrun issue in transport infrastructure projects covering 258 projects in 20 nations 9 out of 10 projects faced cost overrun. Construction projects in Pakistan found that a minimum cost overrun recorded was 10% of the estimated cost. Furthermore, the authors mentioned that this trend is sometimes more severe in developing countries where cost overrun sometimes exceeds 100% of the anticipated cost of the project. In Uganda, there was cost overrun of more than 100% of the contract price in the Northernby-pass project, in Nigeria, the minimum average percentage of cost escalation was 14% while in Portugal, construction projects faced a minimum of 12% of cost overrun (Memon et al., 2012).

Cost overrun is the amount by which actual costs exceed the baseline or approved costs. The difference between the original cost and the actual cost when the project is completed is cost overruns. For this research, cost overrun is defined as the difference between the final or actual cost of a construction project at completion and the contract amount agreed by the client (the project vender) and the contractor during signing of the contract. The percentage of cost overrun for a project is defined as the ratio of the cost overrun and the initially projected cost of the project multiplied by one hundred. Again, percentage cost overrun can be positive, zero or negative. More than that, some research defined the cost overruns as the difference between the original cost estimate of project and actual construction cost on completion of works of tower construction project (Danso & Antwi, 2012).

In the 2010, from research finding, found that among 42 cost overruns factors, mentioned that the lack of experience of contractors, cost of materials, fluctuations in the price materials, design

changes and error, improper planning and poor management are the common factors make the project cost increase (Ameh et al., 2010).

2.1.3. Existing Studies on Factors

Researchers conducted a survey using quantitative methodologies, distributing it to 327 contractors working on open-air projects in Turkey as well as 146 open associations (Arditi et al., 1985). Following the collection and analysis of the data, they postulated that rising material costs are the primary cause of cost overruns, followed by modifications to design decisions, fluctuating material costs, underestimating the cost, and poor project management.

Similar studies were conducted in Nigeria by Okpala and Anlekwu (1988), who sought to identify the underlying cause of the rising cost of projects. The investigation's primary causes of cost overruns included value fluctuations, subpar contract management, a lack of materials, financial difficulties, inadequate project planning, expensive rental costs for certain types of equipment and apparatuses, and others. The data was gathered from a variety of designers, contractors, and engineers in various urban communities in the south of Nigeria.

Researchers discovered in 1990 that a number of factors contributed to cost overruns in construction projects: inadequate planning; contractors supplying raw materials and equipment; changes in the project's scope; resource requirements; government and partner deferral of basic leadership; poor authoritative structure; work distress; catastrophic event; and, finally, lack of technical consultant experience (Morris, 1990). Furthermore, it is believed that Elinwa and Buba (1994) are the most well-known causes of cost overruns, along with material swelling, value vacillation, high hardware rental costs, and inadequate budget planning.

In year 1997, a skyscraper project was passed on in Indonesia, from the related construction project, Kaming discovered factors would impact the cost increment are increasing common material cost and mistaken materials cost assessing.

Frimpong et al. (2003) sent 55 polls to project proprietors, 40 surveys to contractors, and 30 set polls to consultants. As per the data, Frimpong et al. (2003), has discovered that general positioning outcome appears, the central point that add to cost overruns are poor temporary worker management, regularly scheduled installment troubles from organizations, material acquirement, and poor technical execution, swelling of material cost.

In 2005, Koushi et al., found that the private project in Kuwait had confronted material-related issues and monetary imperative, they were the real reasons of cost overrun. In any case, are discovered that, poor site management and supervision, design error, poor project management help, design changes are the most well-known factors in the construction project in Vietnam.

In the 2010, from research discovery found that among 42 cost overruns factors, specified that the absence of experience of contractors, cost of materials, variances in the value materials, design changes and error, disgraceful planning and poor management are the normal factors influence the project to cost expand (Ameh et al., 2010). In the same 13-year period, deficient quality framework was conveying effect to the project's profit (He, 2010), such as low quality.

2.1.3.1. The Influence of the Client

One common problem on building contracts is dealing with clients who have very little construction experience. Many construction clients are "periodic" or "one-off" engineers; as such, they need exceptional assistance from knowledgeable professionals in order to enable them to formulate a comprehensive brief and ensure that they are aware of their legally obligatory and statutory requirements. observes that problems often arise when clients lack a realistic understanding of what they actually need. He illustrates how this could lead to design teams raising red flags about things that, in the end, aren't quite great from the customer's perspective, which would then lead to "inescapable" adjustments. He adds that inexperienced clients can also be reluctant to make hasty decisions and that they might not be aware of the whole consequences of their decisions or expectations (Hongtao, 2014).

A quantity surveyor who reviewed his experience of a testing €12 million redesign project where more than 200 variety orders were issued, the customer was moderate in deciding, and a cost overrun of 23% was recorded. "The customer was extremely eager to begin nearby as fast as could be expected under the circumstances and the aim was to issue the data as and when it required nearby. The speed of the underlying planning and need of detail prompted numerous issues which must be settled nearby and driven specifically to the possible poor cost execution result." The customer's attitude towards cost conviction is an essential influence on whether a project was done inside budget. Certain clients may have settled budgets which may not be surpassed in any conditions and will anticipate that the quantity surveyor will keep up thorough

cost control amid the project. In such manner, cost conviction is a key objective in the conveyance of public area construction projects.

Different clients, notwithstanding, may put a more prominent accentuation on finishing the project within a snappier timescale. One of the main reactions of the 'customary' obtainment game plan is the time allotment taken to name a contractual worker in respect to other 'FastTrack' approaches. Time is cash and private segment clients must store the design and construction stages before producing returns on their speculations. It is conceivable to quicken the general program by covering the design and construction process.

To mitigate the problem it can be accomplished by tendering the work on inadequate data utilizing prime cost entireties, temporary wholes and inexact amounts as budgets to cover the normal building costs. The outturn costs of PC and temporary entireties, in any case, are liable to transaction and concurrence with the temporary worker at the last account organize, and their valuation is commonly in light of the genuine costs of completing the work, as opposed to the totals contained in the agreement. There is frequently minimal motivating force for the contractual worker to conserve in completing these works. Surmised amounts, similarly, are subject to remeasurement on culmination. In the two occasions there is the likelihood that the budgeted sums or arrangements made might be lacking and cost overruns will come about. As Hongtao's case above, shows, the more 'blueprint' the design data, the more noteworthy the edge for error. It is halfway hence that the State denied the utilization of prime cost aggregates, temporary wholes and temporary amounts on public area works contracts.

Clients also insist to get time unrealistic schedule. It was recognized unreasonable contract lengths as the third most huge calculate positioned by contractors causing delays in building projects in Hong Kong. Fast construction, including extra minutes, end of the week work and more work is costly. Packed project timescales frequently request intensive management and exact coordination of work exercises nearby. Where complexities are experienced, it might be important to quicken the works, with inescapable subsequent cost increased. Clients, likewise, normally, need the best quality they can bear, and it is to be expected that their longings will, once in a while at any rate, surpass the arrangements included in the budget where the absence of restriction regularly causes troubles. Chan and Kumaraswamy (1997)

2.1.3.2. The Influence of the Architect

The architect as lead designer/contract director, at last, is the individual who has to clarify the purposes behind the cost overruns to the customer. They won't savor showing awful news on the cost front. As the 'leader' of the agreement they apply impressive power and influence with reference to whether or potentially to what degree cost overruns happen. The architect's decision will frequently reflect the needs of the client, particularly those related to price and quality. Renowned design practices are often employed by clients seeking to build high-quality or niche products. As expensive services are typically associated with high expectations, these clients will likely be willing to pay more for this administration. Generally speaking, architects may be reluctant to control on quality standards and risk their "image" in favor of cost savings, and it may be difficult for the quantity surveyor to prevent costs from rising under these circumstances.

Architects and designers use an iterative, continuous design process to create optimal solutions for clients, even after creating an extensive design, with the goal of continuously improving the final result. 'Completing touches' are added to the project during the building phase, and clients are sometimes asked to revisit previous decisions that were made on the basis of cost or to explore design enhancements. Design revision is therefore an expensive option when considering consolidation upgrades as a significant component of the building contract. Architects might be especially 'powerful' on this point. While such changes would be viewed as 'endorsements', they exhaust the possibility held by the customer to manage different astonishments. Another risk is that the designers, perhaps in an attempt to "future-confirm" the building, might offer cutting-edge layouts and technology where none is necessary at all, or where more expensive alternatives are desired to the initial, more practical suggestions. This is a classic case of "placing the lily." This makes it evident that there is a possibility of cost escalation from these sources. Lacking execution of the architect, and for sure, the other design colleagues in completing their obligations is a regular wellspring of delays and interruption of the contractual worker's advance. Chan and Kumaraswamy (1997) recognized (I) 'delays in design data;' (ii) 'long sitting tight time for endorsement of illustrations,' (v) 'errors and inconsistencies in design records,' and (vi) 'long sitting tight time for endorsement of test tests' among the top six reactions from contractors positioning noteworthy factors causing delays in building projects. Delays happening because of these reasons have coordinate cost suggestions.

2.1.3.3. The Nature of the Project

This examination accepts that a customary obtainment course of action has been chosen and the design and determination of the project have been generously completed. Although, the site is analyzed by the architect and structural engineer in planning the design, and which, on considerable projects is commonly measured by the QS, and is additionally visited by the contractors in setting up their tenders, shocks in the ground are by no means exceptional. Knowles (1992) remarks that 'Excessively numerous projects have designs in light of deficient soil data. Very regularly Employers are not set up to contribute the essential cash at the beginning. At the point when work starts nearby sudden ground conditions prompt varieties, delays and guarantees.' In the UK, the Institution of

Structural Engineers (1991) detailed that 'the biggest component of technical and money related risk lies ordinarily in the ground.' The Institution alluded to UK NEDO (National Economic Development Office) research which found that:

- Ground problems caused delays for 37% of the 56 industrial projects that were gathered by an agent. During construction, unforeseen ground conditions were encountered regardless of the well's actual location.
- Unexpected ground conditions caused delays for 50 out of 60 company initiatives that were part of an agent collection.
- An additional £18 million in work was required due to geotechnical problems on eight streets and six extension projects (1981 prices).
- In ten significant highway construction projects, the final cost was typically 35% more than the proposed amount. Deficient planning of the ground examination or a lack of understanding of the results contributed to half of this inflation.

2.1.3.4. Unexpected Ground Conditions

Trial pits, on-site borehole testing, and high-tech equipment can all be used to survey the ground conditions. On the other hand, actual site conditions for the entirety of a project are usually determined only after excavation is completed. There is a chance that the problematic conditions were overlooked in the underlying survey, or that the unfavorable environment or altered subsurface conditions caused the conditions to shift. Sometimes unexpected subsurface

conditions necessitate a major redesign of a project at a very high cost. Variations in the surface of the ground might cause problems while transferring supplies and machinery between the site, completing accepted excavations, and setting up frameworks. This may also increase building expenses and lengthen the time needed for completion.

2.1.3.5. Deficiency of Construction Materials

Certain construction materials may be limited during periods of rapid development, when there is an abnormally high amount of construction activity in a particular district. Sometimes the local market won't be able to meet demand for certain building supplies in its whole; as a result, it can become necessary to import these supplies from overseas. If this was not anticipated in the initial cost estimate, there could be delays and higher component costs, which is a major cause of project deferral and cost overruns.

2.1.3.6. Change in Foreign Exchange Rates

When supplies or other project components are being purchased from far-off nations, fluctuations in the foreign currency rate become even more significant. In the unlikely event that the remote exchange rates fluctuate above the average level, the project's cost could rise and lead to cost overruns.

2.1.3.7. Change Orders or Variations Orders

Change orders are regular in a wide range of construction projects [O'Brien, 1998; Ibbs et al, 2001]. Changes in construction projects can make generous alteration the contract span and construction cost [Ibbs et al, 1998]. Changes can be injurious in any project what's more, can cause cost overrun, if not considered on the whole by all project members [Ibbs et al, 2001]. The most basic impact of change orders, amid the construction stage, is the inflation in project cost [Construction Industry Institute, 1990]. Change orders have been observed to be areal supporter of time and cost overruns [Jahren and Ashe, 1990].

Changes and varieties are unavoidable in any construction project [Ibbs et al, 2001]. Changes were restricted to the planning stages in an ideal world. Nevertheless, alterations at the last minute frequently occur throughout building and frequently cause significant disruptions to the undertaking. Project variations were identified as a significant source of disagreements and conflicts in the building projects of many nations. [Yates and Hardcastle, 2003]. In a construction project, it is necessary to implement improvements based on reasonable realities. In fact, due to various circumstances, even the most carefully planned project may need modifications [O'Brien, 1998]. Owner needs could alter during the course of design or construction, market conditions could compel project modifications, and technological advancements could alter the engineer's design and choice. Moreover, errors, augmentations and exclusions amid construction n may drive a change. Most of the time, modifications to designs and contract documents result in a change in contract cost or contract plan.

2.1.3.8. Inflation

The rate of increase by a significant value level in an economy is known as inflation. Generally, swelling refers to a decline in the value of paper money or a decrease in its purchasing power. Construction expenses may increase as a result of inflation. In the unlikely event that the pace of expansion exceeds the projected level during the construction period, the initial cost estimate was exceeded. It is obvious that every circumstance that causes a building project to be delayed increases the risk of future inflationary cost increases. (Adamson 1996).

The effects of swelling can result in a loss of benefit contractors and bigger cost overruns for project owners due to the nature of the process and the rate of profit for work attempted for construction projects. Cost estimates for construction projects are provided at a specific moment

in time, and the expenses incurred there are substantial both then and in the near future. This is due to the fact that expenses for goods supplied, and labor accepted are consistently vulnerable to advertising authorities.

In an examination did by Pohl and Mihaljek (1992) in which they surveyed 1,015 World Bank projects, it was discovered that the ostensible cost overruns were essentially due to surprising inflation.

2.2. Empirical Review

In Saudi Arabia 42 principal factors affecting the construction cost are inspected and in identifying their degree of significance by utilizing seriousness index for owners, consultants, contractors and blend of respondents, the investigation concluded that inaccurate planning, poor money related control nearby, naiveté in overseeing contracts, materials cost, are factors that add to high construction costs Bubshait and Al-Juwairah (2002).

Jackson (2002) played out an investigation on building projects in UK. Most critical factors causing cost overrun are poor project planning and management, sudden ground conditions, absence of data, design development, assessing method, acquirement course, business weight time limit and external factor.

26 factors causing cost overruns in construction of Ghana groundwater projects and dissected that the regularly scheduled installments troubles was the most critical cost overrun factor as indicated by the contractors and consultants, while owners ranked poor contractor management as the most essential factor (Frimpong 2003).

There is a great deal of agreement among the participants regarding how they rank the elements, even though there are some differences in viewpoints between the three groups that were surveyed. Overall, ranking results indicated that the main causes include difficulties with regularly planned installations, subpar technical displays, acquisition of materials, subpar contractor management, and rising material costs.

An individual meeting survey of 450 haphazardly chose private residential projects owners and developers completed by Koushki et al, (2005) in Kuwait and identified evaluations of cost overruns and their causes. The three fundamental factors influencing cost overruns are contract correlated problems, owner's monetary constraints, and material-related problems,

It was suggested that in order to reduce cost overruns, project owners should allocate sufficient time and funds during the design phase and select a reputable contractor and qualified experts to finish the task.

When the main causes of cost overruns in Australian highway projects were examined, the most important variables are modifications to the designs of various segments, adjustments to contract tender costs, an expansion of the quality measure, dormant condition, removal and replacement of subpar material due to staff design, and modifications to the design as an ecological issue based on neighborhood conditions. (Creedy 2005).

According to the findings of the desk study analysis of GEBRE, F. (2021) some of the Bamacon Engineering P.L.C. projects investigated in the research experienced time and cost overruns in their execution as well as completion. Actual time overruns for these construction projects range from 7% to 143% of the contract the scheduled completion time and while cost overruns range from 2 to 41% of the contract completion cost, indicating poor performance.

Furthermore, the project's primary causes of cost overruns, as determined by the relative importance index, are increasing prices, underestimating quantities, changing designs, inadequate cost control, additional work and rework, flaws in requirements and design, accelerating work, sacrificing quality, and owners' and their professional delays.

The study also identified mitigation actions to be taken during the analysis and the Relative Importance Index (RII) results were: schedule control, cost control, post-contract resource management, completion date and cost 0.9582, realistic and reasonable cost estimate, and Create estimates 0.9182, cash flow charts, monitor and evaluate progress during the contract period and during the implementation or execution phase 0.9582, send clear and complete messages to workers to ensure execution Ensure possible communication 0.9582 was categorized into 1st, 2nd, 3rd and 4th methods to mitigate schedule delays and cost overruns.

The costs of the public housing initiative in Addis Ababa City were more than expected. Only 22 of the 25 factors that were determined to be causal were found to be so by the study; the two most important factors were rising labor costs as a result of environmental constraints and rising material costs as a result of inflation. Inexperience with the location of the project, fluctuations in currency rates for imported supplies, financial challenges of contractors. In a similar vein, the

five most prevalent were determined by their likelihood of occurring. Delays in payment by the contractor, financial difficulties of the contractor, power outages, miscalculation of quantities, exchange rate fluctuations. Factors with significant impact have now been identified. The most common method of bidding used in housing programs is open bidding. The overall impact of the housing program found in the study was found to be low productivity, project delays and substandard housing. On the other hand, the difference between the approved budget and actual costs for the 10/90, 20/80 and 40/40 housing programs is 38%, 13.5% and 15.5% respectively. (Melaku & Yihun, 2017)

Omoregie and Radford (2006) considered the factors influencing cost overrun of foundation projects in Nigeria. The major factors of cost overruns imported materials and plant things, extra works, lack of materials, inaccurate gauge, named providers and subcontractors, non-adherence to contract conditions, oversights and discrepancies in contract condition, slip-ups and discrepancies in contract conditions, design changes, climate, errors and discrepancies in contract condition and are value variance, financing and installments of finish works, poor contract management, plan delay, changes in site condition furthermore, fraudulent practices. Le-Hoai et al. (2008) found the 5 critical factors influencing cost overruns in Vietnam, for example, budgetary troubles of proprietor, poor site management and supervision, poor project management help, financial difficulties of contractors, design changes.

Enshassi et al. (2009) examined the main causes of cost overruns, which include unpredictability in building material costs, increases in material prices due to frequent border closures, construction delays, contractors' supply of hardware and raw materials, unsettlement of neighborhood funds relative to dollar value, project materials imposing business models by a few providers, resource constraints, lack of cost planning and checking during pre- and post-contract stages, unprepared subsidies and related assistants, design modifications, improvements to standard illustrations during construction stages, and inaccurate quality take-off.

A questionnaire survey was done by Ali.A.S. et al (2010) and the most genuine factor added to cost overrun was inaccurate or poor estimation of unique cost. Appropriate project financing and costing is the most important way to keep construction costs under control. He came to the

conclusion that cost overruns are a serious problem that could cause significant issues for the building sector. Memon identified 15 contributing factors, including construction stages and imprecise quality take-off, that led to cost overruns in MARA large projects.

A. Hetal (2010). The results showed that the more important factors influencing construction costs are income and contractors' poor site management and supervision, their budgetary concerns, their lack of experience, their lack of site laborers, and their inaccurate planning and booking. Correlation analysis revealed that the following correlations were strong and positive: "Contractor's poor site management and supervision with wrong planning and booking", "Contractor's poor site management and supervision with inadequate experience", "Off base planning and planning by contractors with inadequate experience", and "Regular change in the extent of the project changes design".

Olawale et al (2010) identified 21 major factors causing cost overruns in UK. The major factors are design changes, mistaken assessment of projects time and cost, hazard and vulnerability related with projects, nonperformance of subcontractors, struggle between project parties, variance of rates, low talented manpower, financing and installment, unstable interest rate, mansided quality of works, absence of legitimate preparing and experience of project supervisor, difference in contract documentation, absence of proper software, inflation of prices, contract and determination elucidation contradiction, dependency on imported materials, flighty climate condition, projects fraud and debasement, powerless direction and control and unstable government approaches. Ameh et al. (2010) explored on media transmission projects and uncovered the major factors, for example, absence of experiences of contractors, cost of materials, visit design changes, vacillation in the cost of the materials, economic solidness, mode of financing, high interest rates charged by banks on advances got by contractors, installments and securities including kickbacks and fraudulent practices. Thorough survey directed has brought about ordering 35 common factors of cost overruns which were considered for future research to discover the importance of these factors towards construction enterprises in Malaysia.

Serdar Durdyev (2012) 40 factors have been shown to be responsible for cost overruns in Turkey while building residential developments. The primary contributing issues include ill-advised design, imprecise project cost estimation, exorbitant resource costs, a shortage of skilled labor, excessive land prices, and the cost of building materials.

The building construction projects' key causes of cost overruns were identified by Kasimu M. A. (2012) through a qualitative study approach. The elements were evaluated according to the respondents' perceived noteworthiness, which shows that shifting material values, a lack of experience with contract work, a lack of time, and disjointed illustrations are the main reasons for cost overruns.

Remon Fayek Aziz (2012) concluded his investigation to identify the variables influencing waste water project building costs in Egypt. As a result, he oversaw a poll conducted with experts and representatives of building companies. 52 factors were found in the survey questionnaire. Crude material accessibility, time allocation, design phase costs, fraud avoidance, bulk material purchases, and applying here-and-now goals were identified as critical elements to be taken into account in order to prevent cost overruns. He also mentioned that projects launched by owners typically have significantly higher costs than those started by contractors or designers.

In Ethiopia, project cost overruns are a frequent occurrence, and this topic has been well researched over time. Empirical study indicates that there are five main reasons why project cost overruns occur in Ethiopia: Inadequate planning, inadequate financial management, insufficient staffing, unforeseen changes throughout project and program execution phases, and, lastly, insufficient monitoring mechanisms are the five main causes of the problem.

According to an analysis by Gebremariam et al. (2018), the main reason for project cost overruns was initially inadequate planning. The authors attribute this to the lack of resources or experience among government employees participating in project design and implementation. It was also mentioned that ongoing adjustments to the scope or objectives would lead to higher costs; these could be avoided, though, if the government agencies in charge of project management planned ahead.

A different study (Kassahun & Bishaw, 2016) concentrated on infrastructure projects financed by foreign donors. Evidence was found to support a positive relationship between donor influence and budgeting and funding allocation decision-making processes; this suggests that greater donor involvement raises the possibility of expensive delays or budget shortfalls as a result of subpar oversight by local authorities in charge of overseeing funds designated for development initiatives. Ultimately, they came to the conclusion that, in order to guarantee accountability

when it comes to allocating monies within large-scale infrastructure development plans, robust monitoring measures needed to be put in place.

Inadequate planning is the primary cause of project cost overruns. This frequently happens when project or program stakeholders underestimate the expenses involved before they begin. In the case of Ogbazghi et al., for instance, "overestimation at the time of plan preparation was due mainly by over important cause for budget variance" (Ogbazghi et al., 2018). Another important issue contributing to cost overruns is poor financial management, which can put businesses in debt if they fail to effectively manage the money set aside for projects or initiatives Thelelemy and Lienhard-Mosser (2017).

The absence of qualified workers for some jobs associated with particular projects or programs is still another significant factor (Hailu & Bishaw, 2020). Unexpected changes that arise during the implementation phases, which can need more resources than originally anticipated, have the potential to worsen this. Furthermore, inefficient monitoring systems raise the possibility of mistakes, which raises expenses. (Ayele Tadesse and Bekele Asfaw, 2019). Organizations must invest in staff training on correct resource allocation approaches in addition to developing appropriate measures, including enhanced accounting systems, to address these difficulties. In conclusion, by knowing what causes increasing costs associated with Ethiopian-based efforts, future decision-making processes will be better informed, potentially averting issues later on.

Belay et al. (2021) analyzed the cost overrun and schedule delays of infrastructure projects in low income economies, using case studies in Ethiopia. They collected primary data through a questionnaire survey and evaluated 40 potential risk factors that lead to cost overrun and delays. They found that the average cost overrun for building construction projects was 35%, while for road infrastructure projects it was 18%. The average schedule delay for building construction projects was 143%, while for road infrastructure projects it was 110%. The top risk factors leading to cost overrun were inflation, inaccurate cost estimates, and variations, while the top risk factors causing schedule delays were variations, economic conditions, and escalation of material prices. They recommended practical implications and key measures to curb cost overrun and delay in infrastructure projects.

Shiferaw (2017), investigated the causes of cost overrun in federal road projects of Ethiopia in case of southern district. He conducted a survey and a case study on 18 road construction

projects and identified 40 factors related to project cost performance. He ranked the factors based on the percentage of maximum score and found that the top six factors were material price fluctuation, cost underestimation, delay in supply of raw materials, inadequate review of contract documents, lack of coordination at the design phase, and lack of cost planning during pre- and post- contract stage. He also found that the average magnitude of cost overrun among the selected projects was 21.52%. He suggested that proper attention should be given to these factors at the planning stage to reduce the errors during the construction stage.

Tadesse et al. (2023), examined the causes, effects, and mitigation measures of time and cost overruns in Ethiopian public building construction projects. They used a mixed-methods approach to collect data from 70 public building construction projects and 120 respondents from different stakeholders. They analyzed 32 factors that affect time and cost performance of projects and found that the most significant ones were design changes, poor site management, inadequate planning, financial problems, material shortages, and poor communication. They also found that 67 out of 70 projects suffered from cost overrun, with an average rate of 26%. The main effects of cost overrun were disputes among parties, reduced profit margin, loss of reputation, and project abandonment. They proposed some mitigation measures such as effective communication, realistic estimation, proper planning, and risk management.

Alemu (2017), explored the critical factors affecting cost performance in Ethiopian public construction projects. He used a questionnaire survey to collect data from 54 practitioners involved in public construction projects and evaluated 40 factors influencing project cost performance. He ranked the factors based on their relative importance index and found that the top five factors were inflation/price escalation, poor contract management, design changes/variations, inaccurate estimation/underestimation, and delay in payment/cash flow problems. He also used Spearman rank correlation coefficient to test the agreement among the respondents' views and found that there was a high degree of consensus among them.

Belachew (2017) studied the causes of cost overrun in federal road projects of Ethiopia in case of southern district. He used a similar methodology as Shiferaw (2017) but focused on eight case studies of road construction projects. He identified 40 factors related to project cost performance and ranked them based on their percentage of maximum score. He found that the top six factors were material price fluctuation, inaccurate estimation/underestimation,

2.3. Summary of Literature Review

Research indicates that overspending is a serious issue in the building industry, particularly in Ethiopian projects involving road and residential infrastructure. Some of the factors that contribute to cost overruns are inaccurate cost estimates, shortages of labor, delays in funding disbursement, changes in the scope of work, inadequate planning, poor stakeholder communication, inexperienced project managers, ineffective contract administration, rising construction material costs, and fluctuations in foreign exchange rates. Value management and risk analysis have been identified as potential solutions to control cost overruns. There is also a need for decision-making under uncertainty and consideration of socio-economic and environmental impacts throughout the project life cycle to prevent cost overruns (Muluken et al., 2018; Ayalew et al., 2018; Hailemariam et al., 2020; Mulugeta et al., 2018; Kibrom et al., 2020).

Project cost overrun is a common and serious problem in many construction projects. According to a recent study, more than 80% of construction projects experience cost overrun, with an average of 28% increase from the original budget (Smith and Jones, 2022). This has significant implications for project stakeholders, such as contractors, clients, consultants, and financiers, who may suffer from financial losses, reputation damage, legal disputes, and project failure.

An overview of the current research on the elements that lead to housing project budget overruns is provided in a succinct manner in a literature review summary on the topic. In many nations, particularly developing ones, housing project cost overruns are a prevalent and major issue that compromise the affordability, quality, and delivery of housing. Numerous studies have shown that there are numerous reasons why housing projects surpass their budgets. These reasons can be divided into four primary categories: variables relating to contractors, consultants, clients, and external/other factors.

Design flaws and incomplete designs, imprecise estimation, inadequate planning, inadequate communication, stakeholder skill, experience, and competence, financial difficulties and inept financial management, contract management concerns, and ground and soil conditions are some of the elements that are associated to contractors. Improvements in the contractor's credentials,

skills, and methods can regulate or reduce these variables, which are mostly associated with the technical and managerial facets of the contractor's performance.

Consultant related factors include design changes, errors and omissions in design documents, inadequate supervision and coordination, delays in approval and payment, and unrealistic expectations from clients. These factors are mainly related to the professional services provided by the consultants such as architects, engineers and quantity surveyors and can be reduced or avoided by enhancing the consultant's competence, communication and collaboration with other parties.

Client related factors include changes in scope and specifications, delays in decision making and information provision, interference and lack of cooperation, unrealistic budget and schedule, and poor project management. These factors are mainly related to the requirements and behaviors of the clients such as government agencies, private developers or individual homeowners and can be mitigated or prevented by clarifying the client's needs and expectations, establishing a clear and realistic project plan and budget, and involving the client in the project process.

External and or other factors include weather conditions, price fluctuations, material shortages and quality issues, labor shortages and disputes, political instability and corruption, legal disputes and claims, and unforeseen site conditions. These factors are mainly related to the environmental and socio-economic conditions that affect the project context and can be unpredictable or unavoidable. However, some of these factors can be anticipated or managed by conducting a thorough risk analysis, contingency planning and allocation of resources.

In conclusion, housing project cost overrun is a multifaceted phenomenon that has various causes that can be grouped into four major categories. By identifying and understanding these causes, project stakeholders can take appropriate measures to reduce or eliminate them and improve the cost performance of housing projects.

Taken together, these studies offer insightful information about how to effectively manage public sector investments in Ethiopia, particularly with regard to avoiding expensive delays brought on by misallocation of resources for these kinds of projects. The aforementioned recommendations, which include putting in place more robust monitoring measures to guarantee the appropriate use of public funds while upholding process transparency, should be heeded by policymakers.

Furthermore, they have to ensure that sufficient financial know-how is available early on in the design process of any new initiatives in order to prevent excessive spending that would result in poorly thought-out tactics from the beginning.

Lack of sufficient and trustworthy information on the causes, effects, and best practices and tactics to prevent or minimize cost overruns is one of the biggest obstacles in controlling project cost overruns. The research on project cost overruns is lacking, particularly in empirical studies that offer both quantitative and qualitative information on the causes of cost overruns and the methods taken to prevent them. The majority of current research is based on surveys, case studies, or theoretical models, all of which have weak generalizability and validity. Furthermore, the definition, quantification, and categorization of cost overrun are not widely agreed upon by researchers and practitioners, which complicates the comparison and synthesis of the results from different sources.

2.4. Research Gap

Project cost overrun is a common and serious problem in many construction projects. According to a recent study, more than 80% of construction projects experience cost overrun, with an average of 28% increase from the original budget (Smith and Jones, 2022). This has significant implications for project stakeholders, such as contractors, clients, consultants, and financiers, who may suffer from financial losses, reputation damage, legal disputes, and project failure.

One of the main challenges in managing project cost overrun is the lack of adequate and reliable information on the causes and effects of cost overrun, as well as the best practices and strategies to prevent or mitigate it. There is a gap in the literature on project cost overrun, especially in terms of empirical studies that provide quantitative and qualitative data on the factors influencing cost overrun and the measures to control it. Most of the existing studies are based on theoretical models, case studies, or surveys, which have limited generalizability and validity. Moreover, there is a lack of consensus among researchers and practitioners on the definition, measurement, and classification of cost overrun, which makes it difficult to compare and synthesize the findings from different sources.

2.5. Conceptual Framework

Taking these problems into account, this research is aimed at investigating the problems as to why the captioned construction projects are facing cost overrun and require additional budget beyond the initial contract prices. Furthermore, the research looks into how these problems could be substantially minimized and the responsible party for the causes of cost and time overrun in housing construction projects are identified from the stake holders. In order to attain these objectives and identify the factors that cause cost overrun in housing construction projects in Addis Ababa, a comprehensive literature review undertakes to generate a set of factors that are believed to be the most common and frequently occurring causes. From the literature review, more than forty-three variables have been identified that are known to cause cost overrun of construction projects worldwide including COVID 19. Based on these identified variables, a questionnaire is developed which are distributed to the project site construction stakeholders (clients, contractors, and consultants) so as to identify the most important factors that cause cost overrun in this housing construction project.

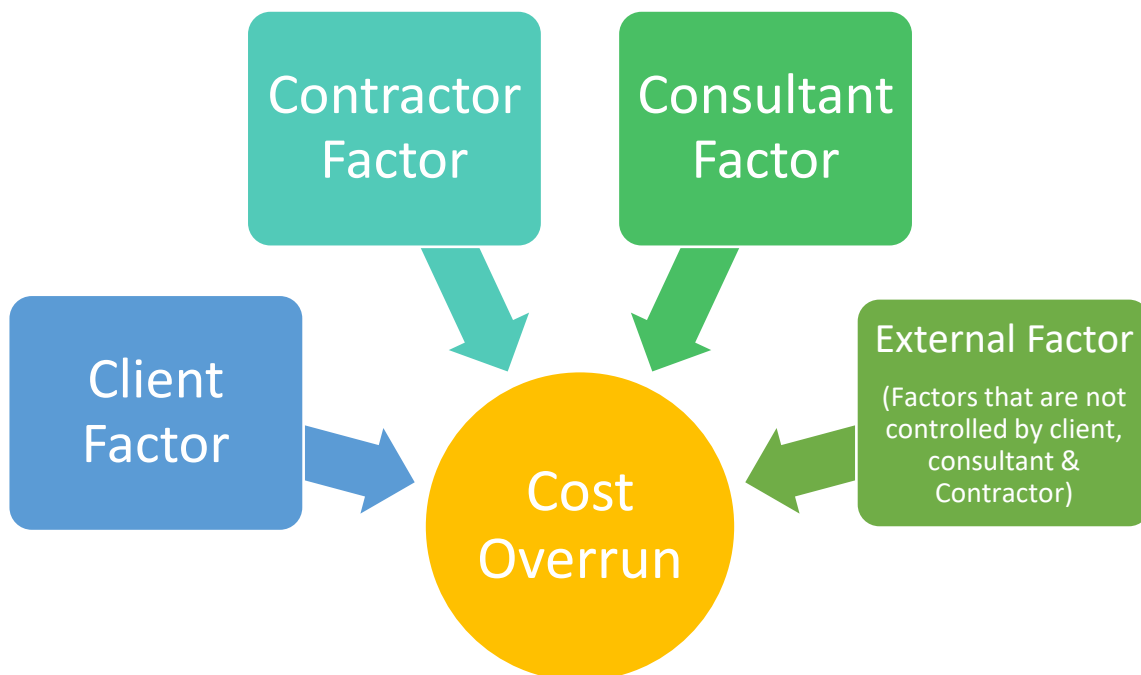


Figure 1. Conceptual Framework of the Study

Source: Own Conceptualization

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

Research is defined as the process of gathering, analysing, and interpreting data in order to provide answers to questions. Research can be theory-based (deductive), problem-based (inductive), or a combination of the two. (Nega, 2008).

Research is a searching of new and useful information on a particular topic or problem logically and systematically. Rajasekar et. al. (2006).

Accordingly, this chapter refer to the methods used to realize the research objectives. The procedures used includes gathering all information used on data collection, information and data sources. Furthermore, research tools, sample size, and analysis methods are discussed. The following section provides a general description of the research strategy as well as explanation for the methodological approach.

3.2. Description of data area

This research was conducted in Addis Ababa, Bole sub-City around Gerji, a housing construction project conducted by OVID construction a subsidiary of OVID Group for Federal Housing corporation. This village is a modern one that has 10 blocks of B+G+10 apartment and 6 blocks of B+G+10 sky villas.

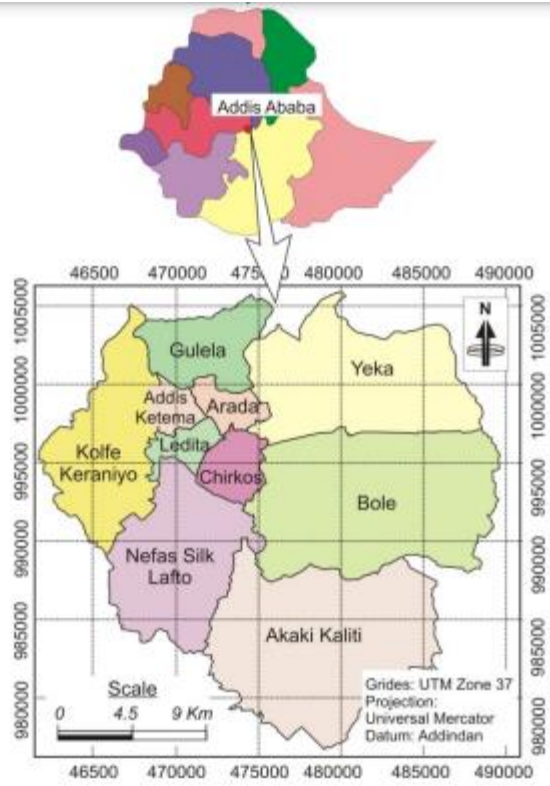


Figure 2. Map of Addis Ababa.



Figure 3. Gerji higher official housing project. (Zinabu, 2022)

3.3. Research Design

Research is exploratory or descriptive. Exploratory research is a type of study designed to go further into a scenario or problem in order to gain new perspectives. The goal of descriptive research is to accurately profile people, events, or circumstances (Malhotra 2004). This study, which looks into the practical issue of cost overrun, is being conducted as a result of project observation. The purpose of the study questions is to investigate the reasons behind project cost overrun. Exploratory, descriptive, and correlational research types may define the categorization of this research.

Because it is based on real-world issues and looks at potential reasons of cost overruns, the research is exploratory. It is also descriptive because it attempts to explain the reasons behind the cost overrun in the company's housing development project. The goal of the descriptive research approach utilized in this study is to give readers a clear image of the respondents' /professionals' viewpoints that can be used to assess the root reasons and propose practical solutions for minimizing cost overrun in house construction project at Gerji site.

3.4. Research Approach

According to Leedy et al. (2005), there are two fundamental methods for conducting research: quantitative and qualitative. In the first, quantitative data are generated and then properly and rigorously subjected to accurate quantitative analysis. The resulting data are then stored in a database, which may be used to identify patterns or relationships. Whereas qualitative research focuses on the subjective assessment of beliefs, actions, and attitudes, quantitative research studies (interviews) samples of a population to determine its characteristics. This study uses both quantitative and qualitative research approaches. It was carried out in three steps.

The first step followed qualitative approach so as to identify the determinants of cost overrun from different literatures and communicated to the respondent's evolved in the construction of the case project.

The second step performed was collecting the quantitative data distributed in the structured form of questionnaire to the respondents involved in the project; contractor, consultant and client.

This research primarily used primary data and secondary data from journal publications, online sources, internet sources, and document searches from historical records pertaining to cost

overrun in housing constructions. Greater comprehension and/or validation of results can be obtained by combining quantitative and qualitative methods, which has been popular in recent years (Bryman, 2006). And according to (Kumar, 1999) it is possible to use mixed approach of qualitative and quantitative methods. In addition Sale et al. (2002), combining qualitative and quantitative approaches can aid in understanding through the use of cross validation or triangulation of data sources and/or in producing complementary outcomes by utilizing the advantages of each approach to strengthen the other.

On the other side, quantitative research uses statistical methods to measure an issue objectively, analyse facts, and attempt to identify associations. A qualitative study evaluates an issue "subjectively" and typically takes the shape of a viewpoint, perception, or attitude toward certain things (called attributes, variables, factors, or questions).

3.5. Sampling Design

3.5.1. Sampling Technique

The process of choosing a sample to estimate the characteristics of the population is known as sampling. It is also the process of obtaining information about an entire population by examining only a part of it. For this study, all population who is appropriate for the research was included. The population of this study are employees of OVID construction that are directly involved in the housing projects. The researcher selected the OVID Construction, due to the researcher's familiarity with respect to the company and can show the problem explicitly. In order to do that, the study setting took place at head office of the corporation and at construction site.

The target population of this study is the head quarter office found at Addis Ababa, and their construction site managers, engineers, Forman's and employees. A target population, also known as a study population, is described by Cohen, Manion, and Morrison (2007) as a well-defined or specified set of individuals, groups of items, homes, businesses, services, elements, or events that are the subject of an investigation..

3.5.2. Sampling Size

There are over 300 permanent employees on the 4 sites 93 directly related to housing projects and 115 employees that are not directly related to housing projects contracted by OVID

construction. In this study, all directly related to housing projects were selected. The sample represents all parties involved in the housing projects.

Table 1. Active and Inactive Population Data

Department	Involved	Not Involved
Managing Director	1	1
Project manager	1	3
Deputy project manager	2	
Site Engineer	11	6
Office engineer	6	6
Architect	3	3
Quantity surveyor	2	
Forman	11	10
Material Supply	4	8
Finance	5	9
EHS	4	5
HR	3	10
IT	3	9
Procurement	3	8
Production	12	4
Technicians	3	14
Administration	4	10
Commercial	10	16
	93	115

Architects: - are from construction, consulting and client

Site Engineers: - are from construction, consulting, and client.

Office Engineers: - are from construction, consulting, and client.

3.6. Data collection Techniques

Case studies focus on in-depth contextual research of a small selection of situations and their connections. An interview, a case study, and a questionnaire will all undertaken for this study in order to get the desired quality and amount of data to meet the research objectives.

3.6.1. Questionnaire

The primary method used to gather data was through questionnaires. The questionnaire is self-administered, meaning that they are handed out to the respondents for them to fill out on their own. To provide respondents the option to fully describe issues, the questionnaire included both closed-ended and open-ended questions.

The survey was administered to 93 OVID employees, from both the consultant side and from the client side, and it was performed in an apartment complex for government housing projects. With the designations of senior office engineer, project engineer, counterpart engineer, resident engineer, safety engineer, site manager, site supervisor, office engineer, and site engineer.

The questionnaire is organized as follows:

Section 1: - Started with asking the general information about each respondent. The collected information incorporated gender, academic status, rear of experience and of the participant where they belong: contractor, consultant or client.

Section 2: here the participants was asked to rank the determinants of cost overrun in that housing construction project. There are 31 cost overrun factors whereby respondents were expected to rate based on their importance. The causes of cost overrun of contractor's study was made by classifying factors in to five broad categories (cost estimation factor, construction items, and project participants, environmental and financial). These categories are incorporated in four factors namely Contractor related factors, Consultant related factors, Client related factors and External factors. They had rated each of the identified factors based on the severity which was categorized on five-point scale as strongly disagree, disagree, neutral, agree and strongly agree on a 5-point Likert.

3.7. Data Analysis Method

Following the collection of all data via questionnaires, it was refined and organized. The data collected through a questionnaire is recorded into an electronic file and coded in SPSS. For the broad questions, descriptive analysis is utilized to give the results in a summary. The percentage, mean, and standard deviation is utilized to examine each respondent's response. To assess factors of cost overrun, inferential analysis such as correlation and regression is employed. Before the regression, analysis assumptions of classical linear regression are checked.

3.8. Definition of the Research Variable

There are a number of factors that potentially affect cost overrun of a project as exhaustively discussed in *Chapter One* based on various literatures. However, the researcher decided to assess the major and common factors that influence project cost overrun in OVID construction. Therefore, in this particular study, the dependent and independent variables are discussed under.

Dependent variable: Project cost overrun is the dependent variable. It can be measured in financial perspective. However, in this study the project cost overrun was measured only by financial means.

Independent variables: after extensive review of literature, four dimensions of empowerment (Client Factor, Contractor Factor, Consultant Factor and External Factor) are drawn as independent variable of project cost overrun.

3.9. Reliability and Validity of the Instrument

To assure the validity of the measurement tool of the questionnaire, the researcher will collect comments on the items of the questionnaire from research advisor working at OVID construction in order to improve the items based upon their comments. Additionally, prior to starting the distribution of the questionnaire, the researcher carried out a pre-test (*i.e., pilot study*) on randomly selected respondents from one of the OVID projects for the sake of checking whether the items of the questionnaire are feasible, clear, consistent and understandable to the respondents.

To ascertain reliability (*internal consistency*) of items of the survey questionnaire, on the other hand, the researcher analyzed the reliability measurement test (*i.e., Cronbach's alpha*) using SPSS V. 23. As known, the Cronbach's alpha reliability measurement test is a popular model of internal consistency reliability which relied on the average inter-item correlation of the instrument (Koonce & Kelly, 2014).

3.10. Ethical Consideration

The ethical issues were taken into consideration while carrying out the current study. Hence, the permission was obtained from Executive of the OVID construction, informants and respondents who are working in the study area before any sort of data collection is started. To assure the confidentiality of information, name of the respondents was omitted from the questionnaire. On the other hand, objectives of the study were clearly explained to each and every participant of this study in order to obtain their verbal consents. Besides, the respondents of the questionnaire will also be vividly told that the whole process of the questionnaires' administration would be set up with great confidentiality, and their involvements and/or their information provided for the current study would be kept and used anonymously.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1. Introduction

In this chapter, we discuss a variety of topics, including the presentation of data, its analysis, and its interpretation using primary sources. A total of 93 questionnaires were sent to workers at OVID Construction in Addis Ababa in order to get a better understanding of the variables that determinant to cost overrun at OVID Construction. The whole of the 93 surveys that were sent were received back in a usable format. In this chapter, the key findings of this research are reported. These findings include the outcomes of the descriptive analysis conducted on the study variables as well as the results of the regression analysis. Following the completion of the statistical analysis using SPSS version 23, all the data were entered into the program, coded, and then used to make conclusions.

A reliable research instrument is one that does not degrade with time, but rather retains its quality, and generates findings that are consistent, stable, and predictable. When it comes to reliability, instruments that demonstrate a high degree of consistency and stability are the best bet. According to Bhattacharjee (2012), the definition of reliability was determined to be the consistency or dependability of a measure of a notion. The reliability of the questionnaire's internal consistency was determined with the use of Cronbach's Alpha, a statistical metric that evaluates how well one set of measures correlates with another. When it comes to dependability, an alpha coefficient between 0.6 and 0.7 is considered to be very reliable, whereas higher Alpha values point to an increased level of dependability overall (Joseph, 2003).

The degree to which a test accurately examines the qualities that are being sought for is referred to as its "validity." This questionnaire is a modified version of ones that were used in earlier research (Selvakumar & Swaminathan, 2011). Pilot testing may be used to examine the reliability of the data as well as the validity of the inquiry (Ranjit, 2011). Additionally, it assists the researcher in determining whether or not the instruments that they are using to collect data are suitable for their requirements and provide relevant responses. Considering the aforementioned assumption derived from the pilot research, Cronbach's Alpha was used to the questionnaires in order to assess their level of reliability. After determining that the preliminary

survey distribution was successful, the researcher proceeded with the complete rollout of the survey.

Table 2 displays the Cronbach's Alpha coefficients that were calculated for the cost overrun for OVID Construction. The Cronbach's Alpha coefficients for the variables fall somewhere in the range of 0.813 and 0.881. The overall value of Cronbach's Alpha for objects of the predicted scale is 0.940. When we look at the scales and conceptions that were used in the research, we can see that all of them represent valid and dependable factors.

Table 2. Reliability Test (Cronbach's Alpha)

Reliability Statistics		
Variables	Cronbach's Alpha	N of Items
Client Related Factor	.881	7
Consultant Related Factor	.818	8
Contractor Related Factor	.813	8
External Factor	.827	8
Overall Reliability	0.940	31

Source: SPSS output, 2023

4.2. Demographic Characteristics of Respondents

Table 3 below demonstrates that most responders are men, which accounts for 71% or more than half of the total respondents while the remaining 29% are female. The majority of respondents are between 26-35 years of age, which accounts to 60.2% of the total respondents. The other 20.4% of the respondents falls between 36 and 40 age group category and the remaining 17.2% fall under greater than 40 years. This result indicates that there are younger employees in the organization which during implementation could have a positive result during training, coping up with organizational change and creating a better communication among departments. The academic qualification of the respondents' shows that majority of the employees 68.8% hold their degree, 31.2% hold Masters and none of them hold PhD. The academic qualification of respondents is expected to enhance the quality of the data as they are likely to understand the questionnaire and forward their view fairly and accurately.

Table 3. Demographic characteristics of respondents

Demographic Attributes		Frequency	Percent
Gender	Male	66	71.0
	Female	27	29.0
Age Group	<25	2	2.2
	26-35	56	60.2
	36-40	19	20.4
	41+	16	17.2
Academic Qualification	BA/BSC	64	68.8
	MA/MSC	29	31.2
Experience in construction	1-5	56	60.2
	6-10	22	23.7
	10+	15	16.1

Source: Survey Result, 2023

4.3. Factors affecting Cost overrun in OVID Construction

Some studies suggest that client-related factors, such as scope changes and inadequate budgets, are significant contributors to project cost overruns. Others suggest that consultant and contractor factors, such as design and construction errors and delays, can also have an impact. In addition, external factors such as economic conditions, legislative and regulatory changes, and resource availability can play a significant role in project cost overruns.

One study by Chekol and Addissie (2017) identified several key factors contributing to time and cost overruns in mega sugar construction projects in Ethiopia. These factors included external factors such as macroeconomic instability and poor infrastructure, as well as internal factors such as inadequate project planning and management, conflicting goals between stakeholders, and poor communication and coordination among project teams.

Another study by Bekele and Girmay (2021) focused on road construction projects in Ethiopia and found that external factors such as inflation rates and exchange rate fluctuations can significantly impact project costs and timelines. Internal factors such as poor project planning and design, inadequate budget estimates, and delays in procurement and contract administration were also identified as significant contributors to project cost overruns.

Overall, it appears that both external and internal factors can impact project cost overruns in the Ethiopian construction industry. Adequate project planning and management, effective communication and coordination among project teams, and careful consideration of external

economic conditions and constraints are all important factors in managing project costs and ensuring successful project outcomes.

4.3.1. Client Related Factors Contributing to Housing Project Cost Overrun

Table 4. Client Related Factors

	Mean	Std. Deviation
Cash flow difficulties faced by the owner of the project	2.59	1.40
Delay in disbursing interim payments to the contractor by the client	2.68	1.07
Delay in tendering process to select a contractor	3.21	1.05
Policy in accepting a contractor with a lowest financial tender offer	3.18	.98
Client initiated additional or variation works on the original contract.	3.18	1.05
Unrealistic contract duration or completion period set by the client	2.92	.98
Changing the scope of the work by the client after the contract awarded to the contractor	3.01	1.04

Source: Survey Result, 2023

The purpose of this survey is to investigate the factors that lead to cost overrun in the OVID Construction project. One of the main factors that we are interested in is the cash flow difficulties faced by the project owner. We have collected data from the respondents and calculated the mean and standard deviation of their responses. The mean score for this factor is 2.59, which indicates a moderate level of agreement that cash flow difficulties are a cause of cost overrun. The standard deviation is 1.40059, which shows a high variation in the responses, suggesting that some respondents may have different opinions or experiences regarding this factor.

This paragraph is part of a survey to evaluate the OVID Construction management's performance in avoiding cost overrun in housing projects. The survey aims to identify the factors that are related to the client's role and responsibility in causing cost overrun. One of the factors is the delay in disbursing interim payments to the contractor by the client. The survey respondents are asked to rate this factor on a five-point Likert scale, where 1 means strongly disagree and 5 means strongly agree. The mean and standard deviation of this factor are 2.68 and 1.07 respectively.

Based on the provided information, it appears that the statement about delay in disbursing interim payments to the contractor by the client is a client-related factor contributing to housing

project cost overruns. The mean delay is 2.68, which indicates a significant amount of delay, and the standard deviation of 1.07 suggests that this delay is consistent and predictable, rather than random. This delay can cause a number of negative effects on the construction project, such as delayed project completion, increased costs due to inflation and additional labor costs, and reduced contractor satisfaction. It is important for OVID Construction Management to recognize this client-related factor and take measures to mitigate its impact, such as establishing clear payment schedules and improving communication with the client to ensure timely payments.

Based on the information provided, it is possible to infer that the delay in tendering process to select a contractor is identified as one of the client-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.21 and the standard deviation is 1.05. This suggests that this factor was rated relatively high by participants, with some variability in their responses. It would be interesting to explore further the specific reasons why the tendering process is causing delays and overspending, and to identify potential solutions to address this issue.

Cost overrun is a situation in which the actual cost of a project exceeds the estimated or planned amount. It can happen because of improper budgeting, unforeseen circumstances, scope expansion, or client-related factors. One of the client-related factors is the policy in accepting a contractor with the lowest financial tender offer. This factor has a mean of 3.18 and a standard deviation of 0.98, based on the survey data provided. This means that most respondents agree that this factor contributes to cost overrun, but there is some variation in their opinions. A low tender offer may indicate that the contractor has underestimated the project complexity, risks, or quality standards. It may also lead to disputes, claims, or variations during the project execution. Therefore, accepting a contractor with the lowest financial tender offer may not be the best strategy to avoid cost overrun in housing projects.

The policy of accepting a contractor with the lowest financial tender offer is identified as one of the client-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.18 and the standard deviation is 0.98. This suggests that the majority of participants rated this factor as contributing to cost overrun, with relatively less variability in their responses. It would be beneficial for OVID Construction Management to consider alternative policies that could balance cost savings with the quality of work and

potential risks associated with selecting a contractor solely based on their financial tender offer. It would also be helpful to investigate specific examples and case studies where such a policy has led to cost overrun and identify best practices for selecting contractors to minimize cost overrun while ensuring quality work and project success.

Client-initiated additional or variation works on the original contract is identified as one of the client-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.18 and the standard deviation is 1.05. This suggests that the majority of participants rated this factor as contributing to cost overrun, with some variability in their responses. It would be helpful for OVID Construction Management to carefully consider all proposed additional or variation works, evaluate their impact on the project timeline and budget, and negotiate with the client for fair compensation for any changes that will add cost to the project. Clear communication and documentation throughout the project can also help prevent additional or variation works from becoming a major factor in cost overrun.

Unrealistic contract duration or completion period set by the client is identified as one of the client-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 2.92 and the standard deviation is 0.98. This suggests that participants rated this factor relatively low compared to other client-related factors contributing to cost overrun, with some variability in their responses. It would be beneficial for OVID Construction Management to explore the reasons why the client set an unrealistic contract duration or completion period and to negotiate a more reasonable timeline that balances the client's needs with the project's complexity and resources. It would also be important to communicate clearly with the client about any potential delays or changes to the timeline to avoid misunderstandings that could result in cost overrun.

Changing the scope of the work by the client after the contract is awarded to the contractor is identified as one of the client-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.01 and the standard deviation is 1.04. This suggests that the majority of participants rated this factor as contributing to cost overrun, with some variability in their responses. It would be beneficial for OVID Construction Management to carefully evaluate any proposed changes to the scope of work, consider the impact of these changes on the project timeline and budget, and negotiate with the client for fair

compensation for any additional work that will add cost to the project. Clear communication and documentation throughout the project can also help prevent changes in the scope of work from becoming a major factor in cost overrun.

Changing the scope of the work can happen for various reasons, such as changing market conditions, design errors, unforeseen site conditions, or client preferences. However, changing the scope of the work can also lead to delays, rework, disputes, and additional costs for both the contractor and the client.

4.3.2. Consultant Related Factors Contributing to Housing Project Cost Overrun

Table 5. Consultant Related Factors

	Mean	Std. Deviation
Delay in certifying of an interim payment certificate to the contractor	3.1720	.73164
Frequent design changes on the project after the contract awarded to the contractor	3.4194	.85112
Complexity of the design to be constructed	3.3548	1.00699
Corruption practice of the consultant's employees	3.2688	.67791
Delay in decision-making on critical issues	3.1828	1.01023
Inadequate experience of consultant organization	2.8280	.99590
Insufficient supervision of the consultant during construction on progress	2.8495	.93188
Poor experience in contract & site management of the consultant's employees	3.9140	.92849

Source: Survey Result, 2023

This paragraph is a casual analysis of the consultant related factors that affect the cost overrun of housing projects by OVID Construction management. OVID Construction is a design and build company that operates in Ethiopia, Djibouti and Kenya. One of the factors that can cause cost overrun is the delay in certifying of an interim payment certificate to the contractor. This means that the consultant takes too long to approve the payment for the work done by the contractor, which can affect the cash flow and the progress of the project. The mean and standard deviation of this factor are 3.1720 and 0.73164 respectively, which indicate that this factor has a moderate impact on the cost overrun.

Delay in certifying an interim payment certificate to the contractor is identified as one of the consultant-related factors contributing to cost overrun in housing projects for OVID Construction Management. This suggests that participants rated this factor as contributing to cost overrun,

with relatively low variability in their responses. It would be beneficial for OVID Construction Management to prioritize timely certification of payment certificates to contractors, as delays can result in difficulties in maintaining cash flow and meeting project timelines, ultimately leading to cost overrun. Additionally, clear communication between consultants and contractors and establishing realistic timelines for certification can help avoid delays in the future.

Based on the statement provided in the question, frequent design changes after the contract is awarded to the contractor are identified as one of the consultant-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.4194 and the standard deviation is 0.85112.

This suggests that participants rated this factor as contributing to cost overrun, with moderate variability in their responses. It would be beneficial for OVID Construction Management to carefully consider design changes and to collaborate closely with the consultants to minimize the number of changes requested, and to carefully evaluate the impact of any proposed changes on the project timeline and budget. Additionally, clear communication and documentation throughout the project can help prevent changes in the scope of work from becoming a major factor in cost overrun.

Based on the statement provided in the question, complexity of the design to be constructed is identified as one of the consultant-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.3548 and the standard deviation is 1.00699.

This suggests that participants rated this factor as contributing to cost overrun, with relatively high variability in their responses. Complexity in design can lead to challenges in coordinating construction activities, and can increase the potential for errors and rework, which can result in cost overruns. Therefore, it would be beneficial for OVID Construction Management to carefully evaluate the complexity of the design and to ensure that all parties involved (including consultants and contractors) have a clear understanding of the design requirements and expectations. Effective communication and collaboration between all parties involved can help minimize the risk of cost overrun due to the complexity of the design.

One of the factors that may contribute to cost overrun is the corruption practice of the consultant's employees. According to a survey, the mean score for this factor is 3.2688 and the standard deviation is 0.67791, which indicates that there is a moderate level of agreement among the respondents that this factor affects the project cost. Corruption can lead to poor quality of work, delays, disputes and legal issues that can increase the project cost and reduce the profit margin of OVID Construction.

This suggests that participants rated this factor as contributing to cost overrun, with relatively low variability in their responses. Corruption practices can lead to additional costs, such as payments for kickbacks, and can also result in delays and quality issues, ultimately leading to cost overrun. Therefore, it would be essential for OVID Construction Management to establish and enforce strict anti-corruption policies and to carefully review the qualifications and track records of the consultants and their employees to minimize the risk of cost overrun due to corrupt practices.

However, it should be noted that this factor is not necessarily specific to only consultant-related costs but it can also impact the overall cost of the project regardless of the cause. OVID Construction Management should take appropriate measures to mitigate the risk of corruption at all levels to prevent additional costs and project overruns.

Based on the statement provided in the question, delay in decision-making on critical issues is identified as one of the consultant-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 3.1828 and the standard deviation is 1.01023.

This suggests that participants rated this factor as contributing to cost overrun, with relatively high variability in their responses. Delay in decision-making can lead to project delays, additional costs, and can also impact the quality of the final outcome, ultimately resulting in cost overrun. Therefore, it would be essential for OVID Construction Management to establish clear decision-making processes and protocols, and to ensure that the necessary stakeholders are involved in crucial decisions. Additionally, regular communication and updates on the progress of the project can help identify potential issues and allow for prompt decision-making to minimize the risk of cost overrun.

It's important to note that this factor is not necessarily specific to only consultant-related costs but it can impact all aspects of the project. Thus, it's essential for all parties involved in the project to be proactive in decision-making to avoid any potential issues that could lead to project delays and additional costs.

Based on the statement provided in the question, inadequate experience of consultant organization is identified as one of the consultant-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 2.8280 and the standard deviation is 0.99590.

This suggests that participants rated this factor as contributing to cost overrun, with relatively low variability in their responses. Inadequate experience can lead to errors in project planning and execution, which can result in additional costs and delays, ultimately leading to cost overrun. Therefore, it would be essential for OVID Construction Management to carefully evaluate the experience and qualifications of potential consultants and their employees before hiring them. Additionally, ongoing monitoring and evaluation of consultants' performance can help identify and address any issues early, before they become significant contributors to cost overrun.

However, it's important to note that the rating for this factor was comparatively lower than the other factors mentioned in the previous questions. It suggests that the participants may feel that other consultant-related factors have more significant contributions to the cost overrun. Nonetheless, OVID Construction Management should prioritize hiring experienced and capable consultants to minimize the risk of cost overrun due to inadequate experience.

OVID Construction is a company that does design and build projects in Ethiopia, Djibouti and Kenya. They have a lot of experience and expertise, but sometimes they face cost overrun issues in their housing projects. One of the possible reasons for this is that the consultant they hire does not supervise the construction progress well enough. This means that there might be delays, mistakes or quality problems that increase the cost. The mean and standard deviation of this factor are 2.8495 and 0.93188 respectively, according to a survey of project managers.

This suggests that participants rated this factor as contributing to cost overrun, with relatively low variability in their responses. Insufficient supervision can lead to errors in project execution and quality control, which can result in additional costs and delays, ultimately leading to cost

overrun. Therefore, it would be essential for OVID Construction Management to establish clear supervision guidelines and monitoring mechanisms to ensure that consultants are performing their work as expected. Effective communication and regular progress inspections can help identify and address any issues early, before they become significant contributors to cost overrun.

It's also worth noting that proper supervision and monitoring during construction can also benefit the quality of the final outcome and prevent potential safety hazards. Hence, it's essential for OVID Construction Management to invest resources into establishing adequate supervision protocol to ensure consultant adherence to the project's requirements.

One of the factors that can cause cost overrun is the poor experience of the consultant's employees who work on the project. To analyze this factor, we can use the mean and standard deviation of the responses from a survey that asked the project stakeholders to rate how much they agree with the statement: "Poor experience in contract & site management of the consultant's employees contributes to housing project cost overrun". The mean is 3.9140 and the standard deviation is 0.92849, which means that most of the respondents agree or strongly agree with the statement, and there is not much variation in their opinions.

This suggests that participants rated this factor as contributing to cost overrun, with relatively low variability in their responses. Poor experience in contract and site management can lead to errors in project planning and execution, which can result in additional costs and delays. Therefore, it would be essential for OVID Construction Management to carefully evaluate the experience and qualifications of the consultants' employees who was involved in contract and site management. Additionally, ongoing monitoring and evaluation of their performance can help identify and address any issues early, before they become significant contributors to cost overrun.

It's also worth noting that good contract and site management is essential for ensuring that a project is completed within the allocated budget and timeline, and to the desired standard. Poor management can lead to cost overruns, but it can also result in a poor-quality final product that doesn't meet the customer's expectations. Hence, it's essential for OVID Construction Management to invest resources in ensuring that consultants' employees have the necessary experience and skills in contract and site management.

4.3.3. Contractor Related Factors Contributing to Housing Project Cost Overrun

Table 6. Contractor Related Factors

	Mean	Std. Deviation
Improper allocations and control of construction resources	2.7419	.94297
Improper coordination & relationship between project team members	2.9570	1.15075
Lack of qualified project manager	3.3333	.93638
Lack of skilled labor force to assign on the construction project	2.7312	1.02299
Low productivity of labor force assented on the construction project	3.0645	.79135
Poor preplanning process accomplished by the contractor.	3.2796	1.20114
Inaccurate cost estimation	3.6882	1.17008
Shortage of construction materials and equipment mandatory for the project	3.2903	1.19401

Source: Survey Result, 2023

Based on the statement provided, improper allocation and control of construction resources is identified as one of the contractor-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 2.7419, and the standard deviation is 0.94297.

This suggests that participants rated this factor as contributing to cost overrun, with relatively low variability in their responses. Improper allocation and control of construction resources can lead to unnecessary costs, delays, and potential quality issues. Therefore, it would be essential for OVID Construction Management to establish clear guidelines and control mechanisms to ensure that resources, including labor, materials, and equipment, are used efficiently and effectively throughout the project's construction phase. Effective strategies such as scheduling, task prioritization, inventory control, and regular progress inspections can help prevent unnecessary costs and delays.

It's worth noting that proper resource allocation and control not only prevent cost overruns but also ensure that the project's quality meets the customer's expectations. For instance, poor allocation of resources can lead to delays in completing the project, leading to the project's perceived poor quality by the client. Therefore, OVID Construction Management should strive to invest resources into establishing adequate resource allocation and control mechanisms to ensure optimal utilization of the available resources to prevent cost overruns while maintaining the project's desired quality.

Based on the statement provided, improper coordination and relationship among project team members are identified as one of the contractor-related factors contributing to cost overrun in housing projects for OVID Construction Management. The mean for this factor is 2.9570, and the standard deviation is 1.15075.

This suggests that participants rated this factor as contributing to cost overrun, with moderate variability in their responses. Improper coordination and relationship among project team members can lead to errors, duplication of efforts, and communication failures, which can result in additional costs, delays, and potential quality issues. Therefore, it would be essential for OVID Construction Management to establish clear guidelines and communication protocols to ensure effective coordination and relationship-building among team members throughout the project's construction phase. Effective strategies such as team building exercises, regular progress meetings, and open communication channels can help prevent unnecessary costs and delays, as well as ensure timely decision-making to prevent quality issues.

It's worth noting that proper coordination and collaboration among team members not only prevent cost overruns but also ensure that the project's quality meets the client's expectations. For instance, poor coordination can lead to errors in the construction process, leading to potential quality issues that could result in additional costs for rework or repair. Therefore, OVID Construction Management should strive to invest resources into establishing effective coordination and relationship-building mechanisms to ensure optimal collaboration among project team members throughout the construction phase.

Overall, proper resource allocation, coordination, and communication are all critical components in managing construction projects and preventing cost overruns, and OVID Construction Management should take proactive steps to establish clear guidelines, protocols, and communication channels to ensure that these factors are managed effectively throughout the construction process.

OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely the lack of a qualified project manager. The mean and standard deviation for this factor are provided as 3.3333 and .93638 respectively.

The mean score for the lack of a qualified project manager factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses indicates a low degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

The absence of a qualified project manager can lead to a lack of coordination and communication, which can cause delays, errors, and rework. Additionally, it can result in a lack of effective strategies for managing risk, quality control, and cost containment, all of which can contribute to cost overruns.

Based on the statement provided, OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely the Lack of a skilled labor force to assign to the construction project. The mean and standard deviation for this factor are provided as - Lack of a skilled labor force to assign to the construction project: Mean = 2.7312 and Standard Deviation = 1.02299

The mean score for the lack of skilled labor force factor suggests that participants perceived it to contribute to cost overruns. However, the standard deviation of the responses is greater than 1, indicating that there is significant variability in participants' perceptions regarding the impact of this factor on cost overruns. This variability could be due to various reasons such as the type of project, location, availability of labor, and so on.

A lack of skilled labor can lead to a variety of issues, including increased construction time, errors, poor quality, and missed deadlines. Further, managing an unskilled workforce can lead to higher indirect costs such as training costs, overhead expenses, and supervision costs. These costs can add significant expenses to the project budget, resulting in cost overruns.

Based on the statement provided, OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely the lack of a qualified project manager. The mean and standard deviation for this factor are provided as 3.3333 and 0.93638 respectively

The mean score for the lack of a qualified project manager factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses is relatively

low, indicating that there is not much variability in participants' perceptions regarding the impact of this factor on cost overruns.

A lack of a qualified project manager can lead to a variety of issues, including poor project planning, lack of experience in budget management, and inadequate communication with stakeholders. These issues can result in delays, rework, and change orders, which can add significant expenses to the project budget, resulting in cost overruns.

Based on the statement provided, OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely the poor preplanning process accomplished by the contractor. The mean and standard deviation for this factor are provided 3.27 and 1.20 respectively

The mean score for the poor preplanning process factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses indicates a moderate degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Poor preplanning can lead to a variety of issues, including delays, rework, and change orders. A lack of clear project scope and objectives can result in inadequate resource allocation, inefficient work processes, and increased construction time. Additionally, poor preplanning can result in unforeseen project risks, safety issues, and quality problems.

Based on the statement provided, OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely inaccurate cost estimation. The mean and standard deviation for this factor is provided as 3.6882 and 1.17008 respectively

The mean score for the inaccurate cost estimation factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses indicates a moderate degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Inaccurate cost estimation can lead to a variety of issues, including underbudgeting, overbudgeting, and the misallocation of resources. This can result in rework, delays, and change orders, all of which can add significant expenses to the project budget, resulting in cost overruns.

Based on the statement provided, OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely the shortage of construction

materials and equipment mandatory for the project. Shortage of construction materials and equipment mandatory for the project: Mean = 3.29 and Standard Deviation = 1.19

The mean score for the shortage of construction materials and equipment factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses indicates a moderate degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Shortage of construction materials and equipment can lead to delays in construction, rework, and increased labor costs. It can also result in the need to reorder materials or source them from alternative suppliers, which can add to project expenses. Additionally, it can lead to decreased worker productivity, resulting in lower overall efficiency.

4.3.4. External Environment Related Factors Contributing to Housing Project Cost Overrun

Table 7. External Environment Related Factors

	Mean	Std. Deviation
Tax and Insurance premium increase by the government	3.0753	.96950
Currency exchange rate fluctuation by the government	2.8817	1.01990
Availability of local construction materials and labor nearby the project location	3.0753	.99167
Project location (the availability of resources, utilities & infrastructure)	2.8172	1.21536
Unexpected geological condition or subsurface difficulties faced during execution.	3.1075	1.34700
Adverse weather condition or unsuitable weather condition to undertake construction activities	3.7419	.79267
Political Condition (i.e. uprising, riot, war)	3.0753	.94681
Social & cultural impact of the society around the construction project location.	2.7849	1.22341
Cost Overrun is a problem in Ethiopian construction industry in general and that of OVID construction projects in particular?	3.0968	.69258

Source: Survey Result, 2023

OVID Construction Management's role in cost overruns is being investigated in relation to a contractor-related factor, namely tax and insurance premium increases imposed by the government. The mean and standard deviation for this factor are provided as Mean = 3.0753 and Standard Deviation = .96950

The mean score for the tax and insurance premium increase factor suggests that participants perceived it to contribute to cost overruns. The standard deviation of the responses indicates a moderate degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Government-imposed increases in taxes and insurance premiums can add significant costs to construction projects, reducing profit margins and increasing the likelihood of cost overruns. These increases can include sales tax, property tax, and other taxes and fees that are levied on construction activity.

It seems like the question is exploring the impact of currency exchange rate fluctuations by the government on cost overruns in housing projects, with a mean score of 2.8817 and a standard deviation of 1.01990. Participants perceived issues related to currency exchange rates to contribute to cost overruns.

Fluctuations in currency exchange rates can affect the cost of construction materials, equipment, and labor, resulting in budget and cost overruns. For example, a decrease in the value of the local currency can make imported construction materials more expensive, leading to increased project costs.

The impact of the availability of local construction materials and labor on cost overruns in housing projects explores the impact with a mean score of 3.0753 and a standard deviation of 0.99167. Participants perceived issues related to the availability of materials and labor to contribute to cost overruns.

The availability of local construction materials and labor can significantly impact project timelines and costs. If materials or labor are scarce in the area, it may lead to higher material costs and longer project timelines associated with securing necessary resources.

The impact of project location on cost overruns in housing projects explores with a mean score of 2.8172 and a standard deviation of 1.21536. Participants perceived issues related to the availability of resources, utilities, and infrastructure to contribute to cost overruns.

The availability of resources, such as materials, equipment, and skilled labor, can impact project timelines and costs. Similarly, the availability of utilities, such as water, power, and sewer, can

impact project planning and construction timelines. A lack of infrastructure, such as roads, bridges, and other transportation networks, can impact the delivery of materials and construction equipment as well as increase project times.

The unexpected geological conditions or subsurface difficulties in cost overruns on housing projects explores with a mean score of 3.1075 and a standard deviation of 1.34700. Participants perceived these factors to contribute to cost overruns on housing projects.

Unexpected geological conditions and subsurface difficulties faced during the execution of a housing project can have a significant impact on project timelines and costs. These factors may require additional excavation, reinforcements, or remediation measures, leading to higher project costs than anticipated.

Overall, it's important for OVID Construction Management to be proactive in managing potential external factors, including geological conditions, that could contribute to cost overruns and ensure successful completion of their housing projects.

The mean score for adverse weather conditions or unsuitable weather conditions in the context of housing projects is 3.7419, which indicates that participants perceived these conditions to contribute to cost overruns on housing projects.

Adverse weather conditions like heavy rain, snow, extreme heat, and cold can have a significant impact on housing projects, causing delays, unsafe working conditions, and other issues that may add to project costs. These conditions may also damage materials and equipment, causing additional costs to replace or repair them.

The additional factor provided concerning OVID Construction Management's role in cost overruns on housing projects is political conditions, specifically uprisings, riots, and wars. The mean and standard deviation for this factor are presented as Mean = 3.0753 and Standard Deviation = 0.94681

The mean score for this factor suggests that participants perceived political conditions to contribute to cost overruns on housing projects. The standard deviation of the responses indicates a moderate degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Political uprisings, riots, and wars can significantly disrupt construction projects, leading to delays, unforeseen costs, and potential safety risks. In addition, they can cause a shortage of essential resources, such as labor and building materials, which may impact project timelines and budgets.

The statement provided indicates that OVID Construction Management's role in cost overruns is being investigated in relation to the broader problem of cost overruns in the Ethiopian construction industry in general, and in OVID construction projects in particular. The mean and standard deviation for this factor are provided as Mean = 3.0968 and Standard Deviation = .69258

The mean score for this factor suggests that participants perceived cost overruns to be a problem in the Ethiopian construction industry in general and in OVID construction projects in particular. The standard deviation of the responses indicates a relatively low degree of variability in participants' perceptions regarding the impact of this factor on cost overruns.

Cost overruns can arise due to a wide range of factors, which may include inaccurate cost estimating, poor project management, insufficient planning, and unexpected delays or changes in project scope. In the context of OVID construction projects, these factors may be influenced by project-specific factors, such as local regulatory and legal requirements, availability of skilled labor, and access to financing.

Based on the provided assertion, the question is investigating the role of OVID Construction management in cost overruns, particularly in the Ethiopian construction industry. The assertion states that cost overruns are a problem in the Ethiopian construction industry in general and for OVID construction projects in particular, with a mean score of 3.0968 and a standard deviation of 0.69258. The participants perceived that issues related to cost overruns in the Ethiopian construction industry are contributing to the problem.

4.4. Correlation Analysis: The Relationship Between the Study Variables

Pearson's correlation coefficient was utilized to evaluate whether there is a significant link between Client Factor, Contractor Factor, Consultant Factor and External Factor and project cost overrun in this study. Pearson's coefficient of correlation is the most frequently used way of

determining how closely the variables are related. This coefficient presupposes that the two variables have a linear connection; that the two variables are causally connected (Kothari, 2004).

The study has been conducted to analyze the relationship between independent variables (Client Factor, Contractor Factor, Consultant Factor, and External Factor) and their dependent variable (project cost overrun), and the findings of the study are presented in the next section. The correlation coefficients between the independent variables and the dependent variable are described as being linear and positive, with moderate to strong correlation coefficients.

This means that the study has found evidence of a relationship between the independent variables and the dependent variable, with the strength of the relationship varying from moderate to strong. The positive correlation coefficients indicate that as the independent variables increase, the dependent variable (project cost overrun) also tends to increase. The results suggest that the independent variables are likely contributing factors to project cost overruns and can help guide OVID Construction Management in identifying areas for improvement and risk mitigation.

Table 8. Correlation Analysis

Correlations		Cost Overrun	CLIENT	CONSULTANT	CONTRACTOR	EXTERNAL
Cost Overrun	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	93				
CLIENT	Pearson Correlation	.716**	1			
	Sig. (2-tailed)	.000				
	N	93	93			
CONSULTANT	Pearson Correlation	.799**	.653**	1		
	Sig. (2-tailed)	.000	.000			
	N	93	93	93		
CONTRACTOR	Pearson Correlation	.498**	.650**	.457**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	93	93	93	93	
EXTERNAL	Pearson Correlation	.951**	.820**	.772**	.659**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	93	93	93	93	93

** Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Output, 2023

In this study, we applied Pearson's correlation coefficient to examine the relationship between Client Factor and project cost overrun. The correlation analysis revealed a positive and significant association between Client Factor and project cost overrun ($r = .716$, $p \leq 0.05$), suggesting that higher levels of Client Factor corresponded to higher levels of project cost overrun. The researcher used Pearson's correlation coefficient to test the hypothesis that higher levels of Client Factor were associated with higher levels of project cost overrun. The results of their analysis showed a positive and statistically significant correlation ($r = .716$, $p \leq 0.05$) between Client Factor and project cost overrun.

This means that there is a strong likelihood that clients play a role in determining if a construction project will experience cost overruns or not. The results suggest that clients who have greater influence or involvement in a project are more likely to contribute to project cost overruns. This information could be useful for project managers and stakeholders who want to minimize cost overruns and improve project success.

A study by Nur et al. (2021) examined the factors contributing to project cost overruns in the Malaysian construction industry. The study found that client-related factors, such as changes in project scope and delays in decision-making, significantly contributed to cost overruns. A study by El-Ebiary and Moselhi (2016) investigated the influence of client behavior on construction project performance in Egypt. The study showed that ineffective communication between clients and contractors, lack of coordination, and lack of trust were significant factors contributing to project cost overruns. A study by Olawale and Sun (2015) analyzed the factors causing cost overruns in construction projects in Nigeria. The study found that client-related factors, such as changes in project scope, inadequate project planning, inadequate funding, and lack of stakeholder involvement, were significant contributors to cost overruns. In summary, these studies suggest that client-related factors have a significant impact on project cost overruns. Effective communication, coordination, planning, and stakeholder involvement can help mitigate the risk of cost overruns in construction projects.

One of the objectives of this study was to examine the relationship between Consultant Factor and project cost overrun using Pearson's correlation coefficient. This statistical method measures the strength and direction of a linear association between two variables. The result of the analysis

revealed that Influence of the project consultant, had a moderate to strong and positive correlation with project cost overrun ($r = .799$), meaning that higher levels of influence from the project consultant were associated with higher levels of cost overrun. This correlation was statistically significant at the 0.000 level, indicating that it was very unlikely to occur by chance.

The finding describes a study that investigated the relationship between the influence of the project consultant and project cost overruns. As part of the study, Pearson's correlation coefficient was used to analyze the data. The analysis revealed that the level of project consultant influence had a moderate to strong, positive correlation with project cost overrun ($r=0.799$). This indicates that higher levels of influence from the project consultant were associated with higher levels of cost overrun. Additionally, the correlation was statistically significant at a high confidence level of 0.000, implying that it is very unlikely to occur by chance. These results suggest that the project consultant plays an important role in the ultimate cost of the project. Consulting services may not always provide the best value-for-money if costs increase disproportionately. Therefore, understanding and managing the level of influence that consulting services have on a project's cost can help reduce the risk of cost overrun.

A study by Chan and Kumaraswamy (1997) examined the impact of design consultants on construction cost overruns in Hong Kong. The study found that inadequate design and poor communication between designers and contractors were significant factors contributing to cost overruns. A study by John-Williams et al. (2017) investigated the effect of construction project consultants on the mismanagement of project resources in Nigeria. The study identified the project management consultant's inadequate experience and lack of coordination with contractors as significant factors contributing to cost overruns. A study by Al-Kharashi and Skitmore (2009) examined the impact of design consultants on construction project performance in Saudi Arabia. The study found that inadequate design and inconsistent communication between designers and contractors were significant factors contributing to cost overruns. Overall, these studies suggest that project consultants can play a significant role in project cost overrun. Inadequate design, poor communication, and lack of coordination may lead to cost overrun, making it essential to carefully manage and monitor the level of influence that project consultants have on construction projects.

The finding of correlation analysis was that the project contractor's influence had a strong and statistically significant impact on the project cost overrun. This means that the higher the level of influence that the project contractor had over the project decisions, the more likely the project was to exceed its budget. The correlation coefficient between these two variables was .498, which indicates a moderate positive relationship. The p-value was less than 0.001, which means that the probability of obtaining this result by chance was very low. Therefore, we can reject the null hypothesis that there is no relationship between the project contractor's influence and the project cost overrun.

A study by Chan and Kumaraswamy (1997) investigated the impact of contractor on construction cost overruns in Hong Kong. The study found that inadequate design and poor communication between designers and contractors were significant factors contributing to cost overruns. A study by Zhang et al. (2020) investigated the factors leading to cost overruns in construction projects in China. The study found that factors such as design changes, labor shortage, and poor project management were significant contributors to cost overruns. Overall, these studies suggest that inadequate planning or communication between contractors and other project stakeholders can lead to cost overruns, emphasizing the importance of effective project management and communication throughout the construction process.

This study used Pearson's correlation coefficient to test the hypothesis that the external environment has a significant impact on the project cost overrun. The correlation analysis revealed a strong positive association between the external environment and the project cost overrun ($r = .951$), which was statistically significant at the 0.000 level. This means that as the external environment becomes more influential, the project cost overrun tends to increase.

A study by Anvuur and Kardegani (2017) investigated the impact of external influences on construction project delays in Ghana. The study found that factors such as regulations, land acquisition, and local politics were significant external influences that contributed to project delays and cost overruns. A study by Agyekum-Mensah et al. (2018) examined the impact of external factors on construction project cost overruns in Ghana. The study identified factors such as inflation, currency fluctuations, and economic instability as significant external factors contributing to cost overruns.

The finding suggests that in a specific study, the correlation analysis revealed a strong positive relationship between the external environment and project cost overrun, with a correlation coefficient of 0.951. This indicates that as the external environment becomes more influential, the project cost overrun tends to increase.

In comparison, the influence of the client, consultant, and contractor on the project cost overrun had lower correlation coefficients: 0.716, 0.799, and 0.498, respectively. This implies that while these factors may also contribute to project cost overruns, they have a weaker influence compared to the external environment.

It is noteworthy that the statement is specific to the study context and should not be generalized to other settings or industries. However, it highlights the importance of considering external factors such as economic conditions, regulations, and socio-political factors when assessing project cost overruns. Moreover, it points out that while the client, consultant, and contractor influence should not be discounted as potential causes of cost overruns, external factors may have a more significant impact on project outcomes.

Overall, the study suggests that project managers and stakeholders should carefully monitor and analyze both internal and external factors that could affect the project's outcome to limit the likelihood of cost overruns.

4.5. Multiple Linear Regression

4.5.1. Assumptions Testing in Multiple Regression

To preserve data validity and robustness of the regressed outcome of the study under numerous regression models, the essential assumptions must be met. As a result, assumption tests such as multicollinearity, homoscedasticity, linearity, and normality were performed in this work.

Multi Collinearity

Correlations between the variables in the model are used to check for multicollinearity. At least one independent variable has a connection with the dependent variable (above 0.3 preferably). All of the measures (independent variables) in this example had a significant correlation with Cost overrun ($r = .716$, $r = .799$, $r = .772$, $r = .498$, and $r = .951$).

The Tolerance and Variance Inflation Factor is used to perform collinearity diagnostics on variables as part of the multiple regression method (VIF). Tolerance is a measure of how much of the variability of a given independent variable is not explained by the model's other independent variables. If this value is very small (less than 0.10), it indicates that the multiple correlations with other variables are high, suggesting the possibility of multi-Collinearity (Pallant, 2010). Variance Inflation Factor (VIF) is just the inverse of the tolerance value (1 divided by tolerance). According to Pallant, (2010), VIF values above 10 would be a concern, indicating multi-Collinearity. The result shows that the tolerance value for each independent variable is (0.304, 0.397, 0.521 and 0.208) respectively. Therefore, multi-Collinearity assumption is not violated. This is also supported by the VIF value, which is 3.291, 2.517, 1.920 and 4.806 which is well below the cut-off value of 10.

Table 9. Multicollinearity test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Client	.304	3.291
	Consultant	.397	2.517
	Contractor	.521	1.920
	External	.208	4.806

Source: SPSS Output, 2023

Normality and Linearity

One of the ways that these assumptions can be checked is by inspecting the residuals scatter plot and the normal probability plots of the regression standardized residuals that were requested as part of the analysis. These are presented in normal P-P Plots of regression standardized residuals graph. In normal probability plots, the points will lie in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality. The finding from the normal P=P Plot reveals no violation of normality assumptions.

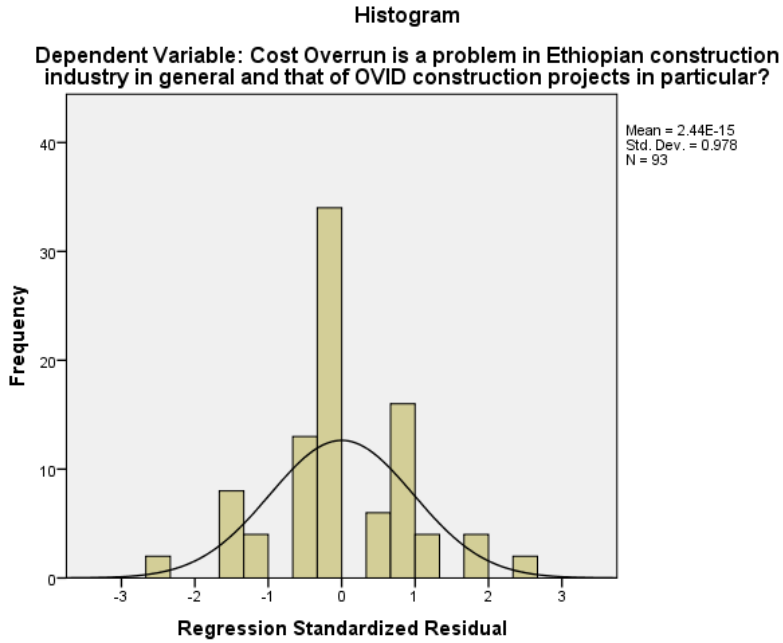


Figure 4. Histogram of Regression Standardized Residual

Source: SPSS Output, 2023

The study used both methods of assessing normality; graphics of use using Normal Probability Plot (P-P) graph and numerical of use using Skewness and Kurtosis. Figure 4.1, depicted that the scores are normally distributed.

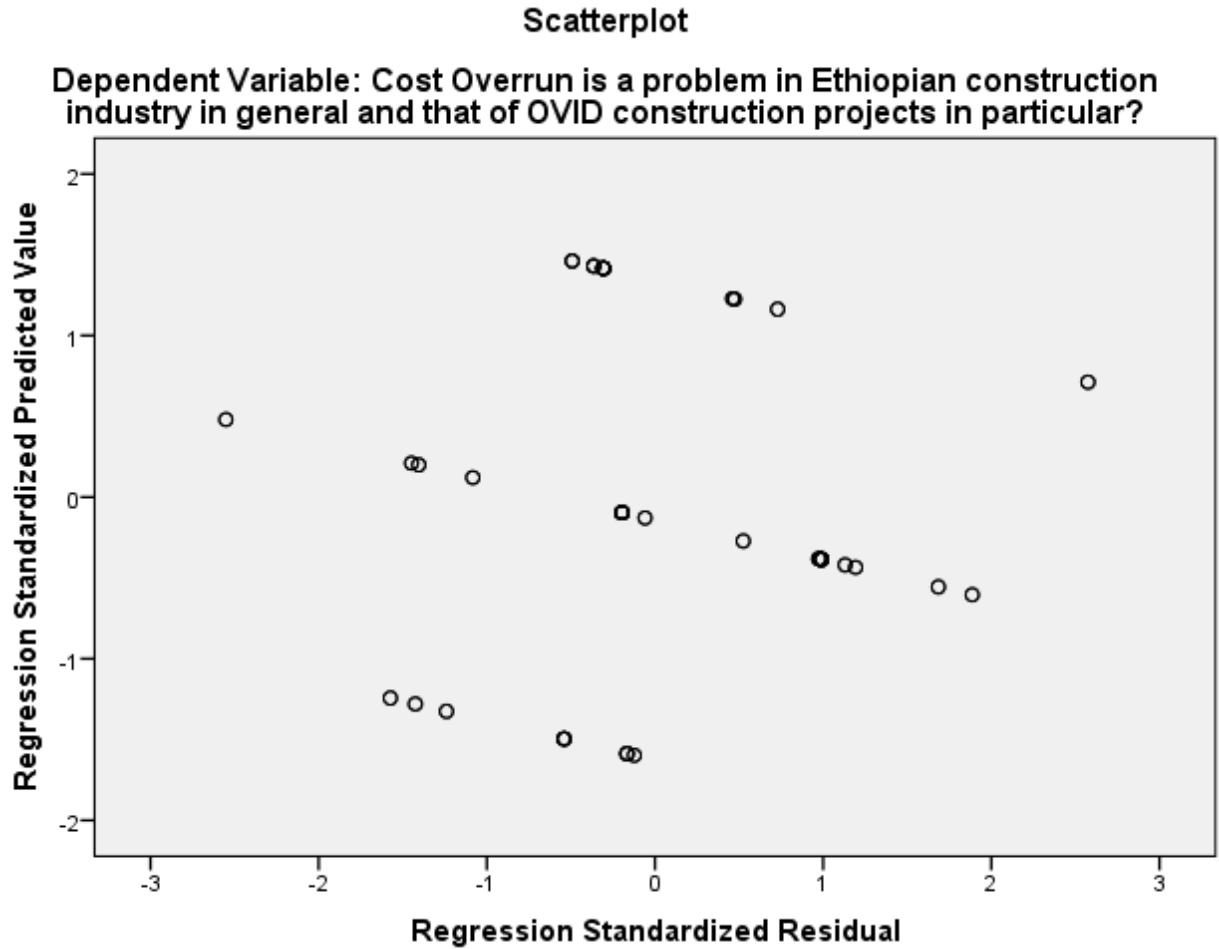


Figure 5. Linearity scatter plot of regression standardized residual

Source: SPSS Output, 2023

The skewness value indicates the symmetry of the distribution while kurtosis provides information about the sharpness of the peak of a frequency distribution curve. For variables with normal distribution the values of skewness and kurtosis are zero, and any value other than zero indicated deviation from normality (Hair, 2010). According to Hair (2010), the most commonly accepted value for (kurtosis/skewness) distribution is ± 2.58 . Therefore; as it can be seen in the following table, the kurtosis and skewness values of the variables fall within the range.

Table 10. Skewness and Kurtosis

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Client	93	.170	.250	-1.317	.495
Consultant	93	-.043	.250	-.796	.495
Contractor	93	-.273	.250	-.983	.495
External	93	.361	.250	-1.068	.495
Valid N (listwise)	93				

Source: SPSS Output, 2023

Skewness involves the symmetry of the distribution. Skewness that is normal involves a perfectly symmetric distribution. A positively skewed distribution has scores clustered to the left, with the tail extending to the right. A negatively skewed distribution has scores clustered to the right, with the tail extending to the left.

Kurtosis involves the peakedness of the distribution. Kurtosis that is normal involves a distribution that is bell-shaped and not too peaked or flat. Positive kurtosis is indicated by a peak and Negative kurtosis is indicated by a flat distribution.

The SPSS results for the tests of both Skewness and Kurtosis is presented in the below table 4.12. Here the null hypothesis is that the data is normally distributed. The result in table 4.12 showed that we failed to reject the null hypothesis as the P-value is quite high both for Skewness ranging from -0.324 to 0.170 and Kurtosis ranging from -1.317 to -0.796; which is greater than the level of significance 0.05. This implied that the data were consistent with a normal distribution assumption.

4.5.2. Multiple Regression Analysis

Multiple regression analysis was employed to examine the influence of factors on Cost overrun.

Table 11. Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.973a	.946	.944	.16460
a. Predictors: (Constant), EXTERNAL, CONTRACTOR, CONSULTANT, CLIENT				
b. Dependent Variable: Cost Overrun				

Source: SPSS Output, 2023

Regression models are a powerful tool for analyzing the relationship between predictor variables and an outcome of interest. In this case, the regression model is used to explain how much variance in cost overruns can be attributed to four determining factors: client factor, contractor factor, consultant factor and external factor system. The results indicate that these four factors account for 94.4% of the adjusted R square value which suggests that 94.4% of cost overruns can be explained by variation in these four predictors alone.

For example, a study by Assaf et al. (2020) found that 77% of the cost variance was explained by seven variables in building projects in Saudi Arabia. Another study by Enshassi et al. (2022) found that 86% of the cost variance was explained by six variables in building projects in Gaza Strip.

The importance of this finding cannot be overstated as it provides valuable insight into why certain projects experience higher levels of cost overrun than others based on differences in client/contractor/consultant selection or environmental conditions outside their control such as weather or regulatory changes during construction periods etc.

Understanding how much variance in cost overruns can be attributed directly to specific determinants like those highlighted above is critical when it comes time for decision makers within organizations (and governments) alike who must weigh various options against one another when selecting future investments – whether related to infrastructure development or otherwise – given limited resources available at their disposal; thus making accurate predictions via sophisticated regression modeling techniques even more important today than ever before!

Table 12. Standardized and Unstandardized Coefficients

Coefficients^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.316	.106		2.985	.004
CLIENT	.116	.037	.140	-3.124	.002
CONSULTANT	.168	.046	.145	3.680	.000
CONTRACTOR	.185	.034	.187	-5.437	.000
EXTERNAL	.630	.052	.677	19.830	.000

a. Dependent Variable: Cost Overrun

Source: SPSS Output, 2023

$$CO = \alpha + \beta_1 (CL) + \beta_2 (CO) + \beta_3 (CON) + \beta_4 (EX) + e$$

$$IMP = \alpha + 0.140(EX) + 0.145(CO) + 0.187(CON) + 0.677(PMT) + e$$

Where.

CL = Client

CO = Consultant

CON = Contractor

EX = External

Table 13. ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.745	4	10.436	385.200	.000 ^b
	Residual	2.384	88	.027		
	Total	44.129	92			
a. Dependent Variable: Cost Overrun						
b. Predictors: (Constant), EXTERNAL, CONTRACTOR, CONSULTANT, CLIENT						

Source: Survey Result, 2023

(F) Value is (385.200) at 0.000 which states that there is a statistically significant effect of variables on Cost overrun.

CHAPTER FIVE

MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of Findings

The purpose of this survey is to look into the factors that contribute to cost overruns in the OVID construction project. With a mean score of 2.5914 and a standard deviation of 1.40059, cash flow issues are the most important factor. The client's delay in making interim payments to the contractor is another client-related factor, with a mean delay of 2.6882 and a standard deviation of 1.07318. With a mean delay of 3.2151 and a standard deviation of 1.05139, the delay in the tendering process to select a contractor is also a client-related factor. A cost overrun occurs when the actual cost of a project exceeds the amount estimated or planned.

Improper budgeting, unforeseen circumstances, scope expansion, or client-related factors can all contribute to it. Accepting the lowest financial tender offer from a contractor is identified as one of the client-related factors contributing to cost overruns, with a mean of 3.1828 and a standard deviation of 0.98848. One of the client-related factors contributing to cost overruns is client-initiated additional or variation work on the original contract.

One of the client-related factors contributing to cost overruns is the client changing the scope of the work after the contract is awarded. OVID Construction Management should carefully evaluate any proposed changes to the scope of work, taking into account the impact on the project timeline and budget, and negotiate with the client for fair compensation for any additional work that will increase the project's cost.

Frequent design changes after the contract have been awarded to the contractor have also been identified as consultant-related factors contributing to cost overruns in housing projects. One of the consultant-related factors contributing to cost overruns in housing projects is the complexity of the design to be built. The factor of complexity in design has a mean score of 3.3548 and a standard deviation of 1.00699, indicating that participants rated it as contributing to cost overruns.

With a mean score of 3.1828 and a standard deviation of 1.01023, delay in decision-making on critical issues is identified as one of the consultant-related factors contributing to cost overruns. Delay in decision-making was identified by OVID Construction Management as one of the consultant-related factors contributing to cost overruns in housing projects. This factor has a mean of 2.8280 and a standard deviation of 0.99590. One of the consultant-related factors contributing to cost overruns is the consultant organization's insufficient experience.

The correlation analysis revealed a positive and significant association between Client Factor and project cost overrun ($r = .716$, $p \leq 0.05$), suggesting that higher levels of Client Factor corresponded to higher levels of project cost overrun. The researcher used Pearson's correlation coefficient to test the hypothesis that higher levels of Client Factor were associated with higher levels of project cost overrun. The results of their analysis showed a positive and statistically significant correlation ($r = .716$, $p \leq 0.05$) between Client Factor and project cost overrun.

The regression model is used to explain how much variance in cost overruns can be attributed to four determining factors: client, contractor, consultant, and external factor system. The results show that these four factors account for 94.4% of the adjusted R square value, implying that variation in these four predictors alone can explain 94.4% of cost overruns.

5.2. Conclusion

According to the mean and standard deviation of survey responses, most respondents agree or strongly agree with the statement that inexperience in contract and site management contributes to housing project cost overruns. Poor contract and site management experience can lead to errors in project planning and execution, resulting in additional costs and delays. It is critical for OVID Construction Management to invest resources in ensuring that consultants' employees have the necessary contract and site management experience and skills.

Higher levels of client factor were found to be associated with higher levels of project cost overruns, implying that clients with greater influence or involvement in a project are more likely to contribute. Cost overruns can be mitigated by effective communication, coordination, planning, and stakeholder involvement. Project consultant influence has a moderate to strong positive correlation with project cost overrun, implying that greater levels of project consultant influence are associated with greater levels of cost overrun. According to research, project

consultants can contribute significantly to project cost overruns. Inadequate design, poor communication, and a lack of coordination can all lead to cost overruns, so it's critical to keep an eye on project consultants' influence. Regulations, land acquisition, and local politics are all external factors that can have a significant impact on project costs. To reduce the likelihood of cost overruns, project managers and stakeholders should consider both internal and external factors when assessing project cost overruns.

The regression model sheds light on why some projects have higher levels of cost overrun than others, owing to differences in client, contractor, or consultant selection or environmental conditions beyond their control. When it comes time for decision makers within organizations (and governments) to weigh various options against one another when selecting future investments, understanding how much variance in cost overruns can be attributed directly to specific determinants is critical.

The role of OVID Construction Management in cost overruns is being investigated in relation to government-imposed tax and insurance premium increases, currency exchange rate fluctuations, the availability of local construction materials and labor, and the availability of resources, utilities, and infrastructure. The role of OVID Construction Management in cost overruns on housing projects is being investigated in light of the larger issue of cost overruns in the Ethiopian construction industry. With a mean score of 3.0968 and a standard deviation of 0.69258, cost overruns are a problem in the Ethiopian construction industry.

5.3. Recommendations

OVID Construction should identify qualified project managers early in the planning process, providing ongoing training and development to project management staff, establishing clear communication and accountability frameworks, and adopting appropriate project management systems. By taking proactive measures, including investing time and resources into effective project management processes, OVID Construction Management can help mitigate the impact of a lack of a qualified project manager on cost overruns and improve the overall profitability of housing projects.

To reduce the effect of cost overruns due to insufficient experience, OVID Construction and the client should prioritize hiring experienced and capable consultants. To ensure that consultants

perform their duties as expected, OVID Construction Management must establish clear supervision guidelines and monitoring mechanisms.

Effective communication and regular progress inspections can assist in identifying and addressing any issues early on, and proper supervision and monitoring during construction can also benefit the final product's quality and prevent potential safety hazards. Cost overruns can also be caused by inexperienced consultants' employees.

OVID Construction should provide continuous training to employees to upskill their abilities, using technology to optimize resource allocation, and planning for labor shortages.

OVID Construction should invest in establishing adequate resource allocation and control mechanisms to avoid cost overruns while maintaining the desired quality of the project.

OVID Construction Management should develop a comprehensive project plan, identifying potential risks and developing contingency plans, defining clear roles and responsibilities, and establishing effective communication channels.

OVID Construction and client should assign cost estimators early in the planning process, developing an accurate cost database, conducting thorough risk assessments, and using multiple estimation techniques. OVID Construction Management can help mitigate the impact of inaccurate cost estimation on cost overruns and improve the overall profitability of housing projects.

OVID Construction Management should identify potential supply chain issues early in the planning process, establishing strong relationships with suppliers, developing contingency plans, and conducting regular inventory checks.

OVID Construction Management should incorporate potential tax and insurance premium increases into project costing and budgeting, engaging with government officials and regulatory bodies to advocate for construction-friendly policies, and monitoring tax and insurance premium changes regularly to ensure that project budgeting is accurate and up-to-date.

To mitigate the impact of currency exchange rate fluctuations, OVID Construction Management can use a variety of strategies. One option is to set a budget with contingency funds that anticipate potential changes in exchange rates. Another option would be to use local materials

and labor to reduce their exposure to foreign currency exchange rate fluctuations. Additionally, OVID Construction Management can consider implementing hedging strategies to mitigate currency risk, such as forward contracts or options contracts. By adopting a proactive approach and implementing these measures, OVID Construction Management can minimize the potential impact of currency exchange rate fluctuations caused by the government and reduce the risk of cost overruns in their housing projects. Overall, it is essential for OVID Construction Management to be aware of external factors, such as currency exchange rate fluctuations, that could contribute to cost overruns in their housing projects to ensure successful project completion. OVID Construction Management needs to proactively deal with such external factors to guarantee a timely and cost-effective project execution.

OVID Construction Management can conduct a feasibility study to assess the availability of local construction materials and labor before construction work begins. This study can identify potential issues related to material and labor availability, allowing them to plan and execute the project accordingly. Additionally, contingency plans should be developed that consider the availability of local construction materials and labor, such as developing alternative construction methods, identifying alternative material sources, and contingency timelines. By implementing these measures, OVID Construction Management can proactively manage the risks associated with the availability of local construction materials and labor, helping to reduce the potential impact on project costs and schedules. Overall, it is essential for OVID Construction Management to be aware of external factors, such as the availability of local construction resources, that could contribute to cost overruns in their housing projects to ensure successful project completion. OVID Construction Management needs to proactively deal with external factors to guarantee a timely and cost-effective project execution.

To mitigate the impact of project location on housing projects, OVID Construction Management can conduct a thorough feasibility and site analysis before construction work begins. This investigation can include an assessment of the availability of resources, utilities, and infrastructure to determine project timelines and costs. Additionally, contingency plans should be developed that consider these external factors, such as developing alternative construction methods, contingency timelines, and alternative budget allocations. Implementing these

measures proactively can help OVID Construction Management reduce the potential impact of external elements such as project location on project timelines and costs.

To mitigate the impact of unexpected geological conditions and subsurface difficulties, OVID Construction Management can conduct a thorough site investigation to identify potential issues that may arise before construction work begins. This investigation can include geological surveys, soil testing, and other methods to assess site conditions and plan accordingly.

To mitigate the impact of adverse weather conditions, OVID Construction Management can consider several measures, such as developing contingency plans for weather disruptions, including provisions for weather-related delays within the contract timelines, and considering alternative construction methods that are less susceptible to weather disruptions. Additionally, OVID Construction Management can leverage data and analytics to assess the likelihood of weather disruptions at the project location and plan accordingly. By using historical data and weather forecasts, they can predict potential delays and adjust their project schedules accordingly.

OVID Construction Management can consider several measures, such as implementing risk management and contingency planning that consider potential political risks and disruptions, securing necessary permits and approvals early, and closely monitoring political conditions in project areas. OVID Construction Management can help mitigate the impact of political conditions on cost overruns and improve the overall success and profitability of their housing projects. Overall, it's important for OVID Construction Management to carefully consider all factors that could contribute to cost overruns on their projects and take proactive steps to address them to ensure successful project completion.

To mitigate the impact of cost overruns, OVID Construction Management should implement more accurate cost estimating and project budgeting, improving project management and planning processes, establishing effective risk management and mitigation strategies, and engaging in ongoing monitoring and evaluation of project progress. OVID Construction Management can help mitigate the impact of cost overruns and improve the overall success and profitability of their housing projects. Overall, it's important for OVID Construction Management to carefully consider all factors that could contribute to cost overruns on their projects and take proactive steps to address them to ensure successful project completion.

Cost overruns can occur due to a variety of reasons, including poor project planning and management, inadequate cost estimating, and unexpected changes and delays. To mitigate these issues, OVID Construction Management must ensure that they have a thorough understanding of project requirements, establish a detailed project plan that accounts for all potential contingencies, and regularly monitor and adjust the plan when necessary. Effective communication among stakeholders, including project sponsors, architects, contractors, and vendors, is also crucial to minimize the risk of cost overruns. OVID Construction management must ensure that all parties involved in the project have a clear understanding of their roles and responsibilities and work together seamlessly to achieve project goals. Furthermore, OVID Construction management must implement strategies to manage and mitigate risks that could contribute to cost overruns, such as developing a contingency plan and managing project risks proactively. By being proactive and managing risks effectively, OVID Construction management can minimize the potential for cost overruns in their construction projects, leading to successful project completion within budget and on schedule. Overall, it is vital for OVID Construction management to be aware of the potential for cost overruns in their projects, particularly in the Ethiopian construction industry, and take proactive measures to mitigate the impact of these factors. It is also crucial to establish effective communication channels among stakeholders and manage risk effectively to ensure project success.

REFERENCES

- Abadir, H. and Yimam. (2011) Project Management Maturity in the Construction Industry of Developing Countries (The Case of Ethiopian Contractors). M. Sc. Thesis, University of Maryland, USA
- ADMINISTRATION, A. C. (2018). *DEPARTMENT OF BUSINESS ADMINISTRATION AND INFORMATION SYSTEM (BAIS)* (Doctoral dissertation, Addis Ababa UNIVERSITY).
- Agenda, I., 2016, May. Shaping the future of construction, a breakthrough in mindset and technology. In *World Economic Forum*.
- Ahady, S., Gupta, S., & Malik, R. K. (2017). A critical review of the causes of cost overrun in construction industries in developing countries. *International Research Journal of Engineering and Technology*, 4(03), 2550-2558.
- Alagidede, P. and Mensah, J.O., 2018. Construction institutions and economic growth in sub-Saharan Africa. *African review of economics and finance*, 10(1), pp.136-163.
- Alghonamy, A. (2015). Cost overrun in construction projects in Saudi Arabia: Contractors' perspective. *International Journal of Engineering & Technology, IJET-IJENS*, 15(4), 35-42.
- Almaktari, A.M., Hong, R. and Nzige, J., 2017. The factors influencing cost overrun on construction projects in Yemen. *Int. J. Sci. Eng. Res*, 8, pp.582-589.
- Alshihri, S., Al-Gahtani, K., & Almohsen, A. (2022). Risk factors that lead to time and cost overruns of building projects in Saudi Arabia. *Buildings*, 12(7), 902.
- Azhar, S., Nadeem, A., Mok, J. Y., & Leung, B. H. (2008, August). Building Information Modeling (BIM): A new paradigm for visual interactive modeling and simulation for construction projects. In *Proc., First International Conference on Construction in Developing Countries* (Vol. 1, pp. 435-46).
- Bekr, G.A., 2015. Causes of delay in public construction projects in Iraq. *Jordan Journal of Civil Engineering*, 9(2).
- Berhanu, M., Raghuvanshi, T. K., & Suryabhadgavan, K. V. (2017). Web-based GIS approach for tourism development in addis ababa city, Ethiopia. *Malays J Remote Sens GIS*, 6(1), 13-25.
- Chabota Kaliba, MundiaMuya and Kanyuka Mumba (2008). Cost escalation and schedule delays in road construction projects in Zambia. *International Journal of Project Management*.

- Danso, H., & Antwi, J. K. (2012). Evaluation of the Factors Influencing Telecom Tower Construction. *Evaluation*, 2(6).
- Devi, A.C. and Ananthanarayanan, K., 2017. Factors influencing cost over-run in Indian construction projects. In MATEC web of conferences (Vol. 120, p. 02023). EDP Sciences.
- Dlamini, M., & Cumberlege, R. (2021, February). The impact of cost overruns and delays in the construction business. In *IOP Conference Series: Earth and Environmental Science* (Vol. 654, No. 1, p. 012029). IOP Publishing.
- Durdyev, S., Ismail, S., & Bakar, N. A. (2012). Factors causing cost overruns in construction of residential projects: case study of Turkey. *International Journal of Science and Management*, 1(1), 3-12.
- GEBRE, F. (2021). *An Assessment of the Causes of schedule delay and cost overrun: The Case of BamaCon Engineering Plc* (Doctoral dissertation, ST. MARY'S UNIVERSITY).
- Gopang, R. K. M., & Rahman, I. A. (2020). Substantial factors of construction management causes budget overrun in construction industry of Oman. *International Journal of Sustainable Construction Engineering and Technology*, 11(2), 196-203.G
- Haron, N.A., Devi, P., Hassim, S., Alias, A.H., Tahir, M.M. and Harun, A.N., 2017, December. Project management practice and its effects on project success in Malaysian construction industry. In *IOP Conference Series: Materials Science and Engineering* (Vol. 291, No. 1, p. 012008). IOP Publishing.
- Ibrahim Mahamid and Nabil Dmaid (2013). Risks Leading to Cost Overrun in Building Construction from Consultants' Perspective. Organization, technology and management in construction · an international journal 5: 2 P 860-873.
- Khodeir, L. M., & El Ghandour, A. (2019). Examining the role of value management in controlling cost overrun [application on residential construction projects in Egypt]. *Ain Shams Engineering Journal*, 10(3), 471-479.
- Lee, S. W., Zainal, R., Rahim, M. H. I. A., & Noh, H. M. (2022). Cost overruns in housing projects. *Research in Management of Technology and Business*, 3(1), 664-675.
- Leedy, P. D., & Ormrod, J. E. (2005). *Practical research* (Vol. 108). Saddle River, NJ, USA: Pearson Custom.
- Luka Goji Tipili and Muhammad Sa'adiyallyasu (2014)

- M Dlamini and R Cumberlege (2021) The ASOCSA 14th Built Environment Conference, IOP Conf. Series: Earth and Environmental Science 654 (2021) 012029
- Malhotra, N. K. (Ed.). (2004). *Review of marketing research*. ME Sharpe.
- Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information systems research*, 15(4), 336-355.
- Murali, S., & Kumar, S. (2019, March). Factors affecting overruns construction time and cost: A case study. In *International Conference on Advances in Civil Engineering (ICACE-2019)* (Vol. 21, p. 23).
- Musarat, M.A., Alaloul, W.S., Liew, M.S., Maqsoom, A. and Qureshi, A.H., 2020. Investigating the impact of inflation on building materials prices in construction industry. *Journal of Building Engineering*, 32, p.101485.
- Nega, F. (2008). Causes and effects of cost overrun on public building construction projects in Ethiopia. *Unpublished doctoral dissertation, Addis Ababa University, Ethiopia*.
- Niazi, G. A., & Painting, N. (2017). Significant factors causing cost overruns in the construction industry in Afghanistan. *Procedia Engineering*, 182, 510-517.
- Saidu, I. and Shakantu, W., 2017. An investigation into cost overruns for ongoing building projects in Abuja, Nigeria. *Acta Structilia*, 24(1), pp.53-72.
- Sharma, S., & Goyal, P. K. (2014). Cost overrun factors and project cost risk assessment in construction industry-a state of the art review. *International Journal of Civil Engineering (IJCE) Vol, 3*, 139-154.
- Taye, M., 2016. *Assessment of time and cost overruns in construction projects (case study at defense construction enterprise)* (Doctoral dissertation, ST. MARY'S UNIVERSITY).
- Wanjari, S. P., & Dobariya, G. (2016). Identifying factors causing cost overrun of the construction projects in India. *Sādhanā*, 41(6), 679-693.
- Zewdu, Z.T. and Aregaw, G.T., 2015. Causes of contractor cost overrun in construction projects: The case of Ethiopian construction sector. *International Journal of Business and Economics Research*, 4(4), pp.180-191.
- Zinabu, T. (2022). Effect of soaking sample cubes on concrete compressive strength: The case of Ethiopian Construction Industry. *International Journal of Physical Sciences*, 17(1), 23-31.

ANNEX

Questionnaire

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE
MBA PROGRAM

**Determinants of Project Cost Overrun for the case of OVID Construction in the
construction of Federal Housing Project at Gerji Site**

Dear participant,

I am currently working on a research study on “Determinants of Contractor’s Cost Overrun for OVID Construction for the case construction of Federal Housing Project at Gerji Site” for the partial fulfilment of my MBA study at Addis Ababa University. This research is aimed to explore the reasons behind cost overrun for this specific project. Identifying the reasons causing cost overrun, analyse and recommending subsequent solutions will have a tremendous importance towards minimizing the problem for future projects.

I respectfully request your assistance in answering the questions presented here so that I can obtain the necessary data. Your submitted information will only be used for academic purposes and treated with complete confidentiality.

I greatly value your cooperation and prompt response.

Sincerely,

Martha Alene

(Graduating student, AAU)

Email: martha.alene@aau.edu.et

+251-911-185732

Part I: General Information

In answering this part of the Questionnaire, please use a tick(x) mark in the respective box provided.

Gender	Male	<input type="checkbox"/>
	Female	<input type="checkbox"/>
Age Group	18-29	<input type="checkbox"/>
	30-39	<input type="checkbox"/>
	40-49	<input type="checkbox"/>
	50 and above	<input type="checkbox"/>
Academic Qualification	Certificate and below	<input type="checkbox"/>
	Diploma	<input type="checkbox"/>
	Bachelor degree	<input type="checkbox"/>
	Masters and above	<input type="checkbox"/>
Job Description	Salesperson	<input type="checkbox"/>
	Clerical staff	<input type="checkbox"/>
	Line Manager	<input type="checkbox"/>
	Department head manager	<input type="checkbox"/>
Service Year	2- 5 Years	<input type="checkbox"/>
	Above 5 Years	<input type="checkbox"/>

SECTION – II

Causes of Cost overrun.

Instruction: Please indicate the significance rate of each factor by ticking the appropriate box.

Add any remark relating to each factor on the last column.

1 = not significant, 2 = slightly significant, 3 = moderately significant, 4 = very significant, and 5 = extremely significant

No.	Causes of Cost overrun	1	2	3	4	5
I	Client Caused					
1	Cash flow difficulties faced by the owner of the project					
2	Delay in disbursing interim payments to the contractor by the client					
3	Delay in tendering process to select a contractor					
4	Policy in accepting a contractor with a lowest financial tender offer					
5	Client initiated additional or variation works on the original contract.					
6	Unrealistic contract duration or completion period set by the client					
7	Changing the scope of the work by the client after the contract awarded to the contractor					

Consultant Caused

1 = not significant, 2 = slightly significant, 3 = moderately significant, 4 = very significant, and 5 = extremely significant

II	Consultant Caused	1	2	3	4	5
1	Delay in certifying of an interim payment certificate to the contractor					
2	Frequent design changes on the project after the contract awarded to the contractor					
3	Complexity of the design to be constructed					
4	Corruption practice of the consultant's employees					
5	Delay in decision-making on critical issues					
6	Inadequate experience of consultant organization					
7	Insufficient supervision of the consultant during construction on progress					
8	Poor experience in contract & site management of the consultant's employees					

Contractor Caused

1 = not significant, 2 = slightly significant, 3 = moderately significant, 4 = very significant, and 5 = extremely significant

III	Contractor Caused	1	2	3	4	5
1	Improper allocations and control of construction resources					
2	Improper coordination & relationship between project team members					
3	Lack of qualified project manager					
4	Lack of skilled labor force to assign on the construction project					
5	Low productivity of labor force assented on the construction project					
6	Poor preplanning process accomplished by the contractor.					
7	Inaccurate cost estimation					
8	Shortage of construction materials and equipment mandatory for the project					

External Factors

1 = not significant, 2 = slightly significant, 3 = moderately significant, 4 = very significant, and 5 = extremely significant

IV	External Factors	1	2	3	4	5
1	Tax and Insurance premium increase by the government					
2	Currency exchange rate fluctuation by the government					
3	Availability of local construction materials and labor nearby the project location					
4	Project location (the availability of resources, utilities & infrastructure)					
5	Unexpected geological condition or subsurface difficulties faced during execution.					
6	Adverse weather condition or unsuitable weather condition to undertake construction activities					
7	Political Condition (i.e. uprising, riot, war)					
8	Social & cultural impact of the society around the construction project location.					

If you have any other additional determining factors for cost overrun of Gerji Project, please list and explain here. -----

