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JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

Causes of Cost Overrun on Public Building Construction Projects: Case Study in Wolaita Sodo Town, Southern Region, Ethiopia.

A thesis Submitted to Post Graduate Program, in Partial Fulfillment of the Requirements for the Degree of Masters of Science in Project Management and Finance

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DEDICATION

This thesis manuscript is dedicated to my families especially for my husband and friends who had great contribution for the success of my life.

List of Abbreviations

SA	strongly agree
AG	Agree
NU	Neutral
DA	Disagree
SD	strongly disagree
RII	Relative important index
COR	Cost overrun
VIF	Variance inflating factor
SPF	Socio political factor
EF	Economic factor
MF	Managerial factor
TPF	Timelines of payment
CTDF	Construction techniques and design change
ANOVA	Analysis of variance
GDP	Gross Domestic Product
PC	Planned Cost
AC	Actual Cost
KSA	Kingdom of Saudi Arabia
SPSS	Statistical Package for the Social Sciences

STATEMENT OF THE AUTHOR

First, I declare that this thesis is my original work and that all sources of materials used for this thesis have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements for MSc degree at Jimma University and is deposited at the university library to be made available to borrowers under rules of the library. I solemnly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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ABSTRACT

The study aims to identify causes of cost overrun on public construction project; in Wolaita Sodo Town. The study used descriptive research design was used and the primary sources of data were collected from 22 construction project in Wolaita Sodo Town. The sampling techniques used in this study were purposive sampling method. However, the sample was selected from public construction project. For data analysis, multiple regression and descriptive statistics including mean and statistical relatively important index (RII) were used. The results of this study conclude that socio political, economic, and managerial, timeliness of payment and financial factor and construction techniques and design changes were identified as factors affecting cost overrun in public construction project. Finally this study recommended that in public construction project the stakeholders and government body should provide a good planning and scheduling during construction and match with the resources and time to develop the work to avoid cost overrun. The stakeholders and government body should revise the bid document such as technical specification during bill of quantities and the design of the project in a good way. However, the stakeholders and government body should facilitate payment to contractors in order to overcome delay in progress payment and avoid the occurrences of cost overrun.

Key Words*: cost overrun, construction project, political instability, design change.*

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Completion of a construction project with budget is frequently seen as a major criterion of project success by clients, contractors, consultants and related stakeholders. It is here that project management becomes essential tool for the delivery of effective projects than the traditional functional management Fugar, et al., (2016). However, the construction industry is faced with challenges to meet budget.

In general cost overrun which is also called cost escalation, cost increase, or budget overrun is the excess of actual cost over the budget. Cost overrun can simply defined as when the final cost of the project exceeds the original estimates. Also is defined as the difference between the original cost estimate of the project and actual construction cost on completion of the work Hemanta Doloi, (2013). In a global study on construction project performance, cost overrun was identified the major problem where 9 of 10 projects faced the overrun in the range of 50 to 100% Flyvbjerg et al., (2003).

Many factors are responsible for these cost overruns such a sunder estimation of costs to make the projects more viable, addition of scope during later stages of project planning and even during construction and changed conditions Fugar, et al., (2016).

One of the most important contributing factors to the magnitude of cost overrun in large transportation projects are project delays. Furthermore, the length of project development phase from planning to construction seems tobe a major factor in the extent of cost overrun Touran and Lopez, (2006).

Cost is the fundamental component for any construction project. However, cost overrun is observed as one of the most frequently occurring issues in construction projects worldwide and need to be more studied to alleviate this issue in the future Memon, et al., (2010). Cost overrun

has become a norm, rather than an exception in the construction industry. So, it is normal to expect that the final cost of a project exceed the initial budget Arcila, (2012).

In addition, in construction project as an indication of project failure so, the key to success is to realize and understand the challenges early in the planning process, to develop strategies to address them and to establish accurate and achievable expectations. Moreover it provides the decision makers with early warning devices to reduce the cost overrun problems. So, understanding these factors allows for appropriate actions to mitigate factor impacts. Project participants can take action to curtail or control the effects of these identified cost escalation factors throughout the life of the project. Indeed, cost overrun occurs due to many factors that differ from one country to another Yenealem Fentahun, (2018).

Bubshait and A. Juwait (2015) stated on factors that cause cost overrun on construction projects in Saudi Arabia; the finding shows that the factors of cost overrun on construction projects such as effects of weather, number of projects going on at the same time, social and cultural impacts, project location, lack of productivity standards in Saudi Arabia, level of competitors, supplier manipulation, economic stability, inadequate production of raw materials by the country, absence of construction cost data.

Frimpongs et al (2008) studied 26 factors that cause cost overruns in construction of ground water projects in Ghana, they sent to 55 questionnaire to owners, 40 to contractors and 30 to consultant. According to the contractors and consultants, monthly payments difficulties from agencies was the most important cost overruns factor, while owners ranked poor contractor management as the most important factor. Despite some difference in viewpoint held by the three groups surveyed, there is a high degree of agreement among them with respect to their ranking of the factors. The overall ranking results indicates that the three groups felt that the major factors that can cause excessive project cost overrun in developing countries arc poor contractor management, monthly payment difficulties from agencies, material procurement, poor technical performances, escalation of material prices according to their degree of influence.

Mwandali (2009) focused on factors that affect project management in Kenya Railway projects. Factors ranging from inflation, project complexity, inaccurate material estimation, financing, change orders, design changes, late submission of drawing, poor specification, incorrect site

information, poor contract management among many others were found to be main sources of overruns.

Kassaye Tsiga, (2018) the study conducted on assessment of factors affecting cost overrun of road Construction Projects, in Ethiopian; the study identified ineffective way of management of material and machinery resources at project, skill of site Management Crew, wrong method of system/approach employed to manage site activities, contract management such as inadequate knowledge and skills of project management and contract administration teams and design errors are the most important factors affecting cost of construction projects in Ethiopia.

Previous studies show that, the ranking of factors causing cost overrun is different from one country to another because of the different circumstances that surround construction industry. Hence, this study focused on identify the most influencing factors in construction project that causing cost overrun.

1.2. Statement of the Problem

There are many factors causing of project cost deviation in other words, causes of variations between estimated cost or planned cost and actual cost of project. These factors can cause cost overrun that are different from one project to another and from one place to another. Hence, the researcher reviewed a lot of studies concern with the causing factors of cost overrun in construction projects. Many studies show that 90% of construction projects have underestimated costs and this percentage increases in the developing countries because of the lack of experience in the project management process Hemanta Doloi, (2013).

There are a number of researches about factors leading to cost overrun occurrence in construction projects in several countries i.e. (developed and developing countries). However, it should be performed more such studies in developing countries, in particular Egypt to face the critical problem of cost overrun in construction field. Past researchers studied the factors affecting construction costs from various perspectives. However, different countries have different cost factors for consideration.

Memon et al, (2011), Toh et al, (2012) and Abd-Karim et al, (2013) mentioned that client requirements on quality, poor design and delays in design, unrealistic contract duration and requirements imposed lack of experience, late delivery of materials and equipment, relationship between management and labor, fluctuation of prices of materials, cash flow and financial

difficulties faced by contractors and shortages of materials are the most influencing factors in cost overrun in Malaysia.

Besides, the viewpoint of Baggies and Fortune (2009) and Alfouzan, (2013) they found that there are many factors lead to cost overrun in construction projects in KSA as decision making regarding tenders which depend on the size of contractor, contractor's classification status and type of main client, corruption in selling lands and government's poor role in monitoring materials prices fluctuations in the cost of building materials, the shortage in construction materials in markets and material problem. Whereas, according to Zujoet al., (2010) the main factor causes cost overrun in Bosnia and Herzegovina is the delay in project's handing over poor technical performances, changes or discrepancies that may occur during the construction period, technical complexity of a project and delay in a project's handing over.

In addition, Ameh et al., (2010) extracted that the junior factors cause cost overrun in Nigeria are the economic stability, shortage of materials, government policies (laws and regulations), domination of construction industry by foreign firms and aids, project location and absence of construction cost data. But, Singh et al., (2011) and Shanmuganathan and Baskar, (2015) mentioned that factors cause cost overruns in India are uncompleted initial designs and poor contracts, Ineffective construction management, poorly established cost control systems, poor project (site) management, poor cost control, additional work, improper planning and changes or discrepancies which occur during the construction period.

Gajewska, and Ropel, (2011) stated that the delay indication making, miscalculation, and not finding the rightcontractor are the most influencing factors of delay the construction projects which leading to cost overrun occurrence in Sweden. In addition, Memon et al., (2011), Toh et al., (2012) and Abd-Karim et al., (2013) they mentioned that client requirements on quality, poor design and delays in design, unrealistic contract duration and requirements imposed, lack of experience, late delivery of materials and equipment, relationship between management and labor, fluctuation of prices of materials, cash flow and financial difficulties faced by contractors and shortages of materials are the most influencing factors in cost overrun in Malaysia.

Cost overrun in construction projects can occur due to various causes. A number of researchers have investigated various causes of cost overrun in different countries. A study in Ghana

considered 26 factors that cause cost overrun in construction of ground water projects Frimpong, et al., (2003).

Ameh, et al., (2010), Memon, et al., (2010), Olawale, et al., (2010) they stated that lack of experience of contractors, fluctuation in the prices of materials, frequent design changes, non-economic stability and high interest rates charged by banks on loans, cash flow and financial difficulties faced by contractors, contractor's poor site management and supervision, inadequate contractor experience, shortage of site workers, poor performance of subcontractors and complexity of works incorrect planning and scheduling by contractor were most severe factors while changes in scope of project and frequent design changes are the major factors affecting cost overrun.

Based on the above previous study the seeds of present study will attempting to find major influencing factors or bottlenecks that affect the occurrences of cost overrun in construction project. It is believed that the challenges for cost overrun were indicated socio political factor due to political interference and instability, economic factor due to economic instability, exchange rate fluctuation, fluctuation in raw material price, managerial factors due to delays in decision making process, poor project management leadership style and owners interference, construction techniques and design factor due to frequent design change, design error and mistakes, incomplete design at the time of tender, deficient design and delays in design process and risk management strategy and time lines of payment and financial factor due to delay in progress payment by clients, poor financial control on site were identified as causes of cost overrun in public construction project. To facilitate the present study, the researcher examining the factors that leads to cost overrun in public construction project.

Therefore, this study may prove critical in bridging the knowledge gap by identifying the factors that cause cost overrun on public building construction project and facilitate appropriate measures to avoid their occurrence and attempts to provide answers for the following basic research questions;

1. How do the social and political factors affecting Cost overrun on public building construction projects in Sodo town?
2. How does the economic factors affecting Cost overrun on public building construction projects in Sodo town?
3. How do the managerial factors affecting Cost overrun on public building construction projects in Sodo town?

4. How do the timeliness of payment and financial factor that cases cost overrun on public building construction projects in Sodo town?
5. How does the constructions techniques and design affecting cost overrun on public building construction project in Sodo town?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study is to identify causes of cost overrun on public building construction projects in Wolaita Zone Sodo town Sothern region, Ethiopia.

1.4.2 Specific objectives

Based on the above general stated objective the following specific objectives are drawn.

1. To assess how sociopolitical factors that causes for the occurrences of Cost overrun on public building construction projects.
2. To determine how economic factors which causes for the occurrences of Cost overrun on public building construction projects.
3. To examine how managerial factors which causes for the occurrences of Cost overrun on public building construction projects.
4. To identify how timeliness of payment and financial factors which causes for the occurrences of Cost overrun on public building construction projects.
5. To evaluate how constructions techniques and design change which causes for the occurrences of Cost overrun on public building construction projects.

1.5. Significance of the Study

The research has a great importance in describing issues on the causes of cost overrun on public building construction. And also this study was gives value to policy makers and academicians. The policy maker uses the recommendations of the study in coming with an effective model of involving the sectors stakeholders for effective cost management. This study was intended to help construction professionals and corporate bodies increase the success of construction projects completion by managing well the factors that was help their successful completion with in stated budget. Government and individual architects, engineers, quantity surveyors,

construction project managers and site agents will benefit from this study by applying the results of its findings while carrying out construction projects. Government funded and Project developers/clients were also benefit from the findings of this study and therefore achieve greater success in their construction projects. This is because they may apply the findings of this study in ensuring the risk factors that may cause their projects not to be delivered successfully mitigated.

It is aimed to find out major issues for the occurrence of cost overrun on public building construction projects. This study was much significance in providing insight for WolaitaSodo town public building construction project bureau since there are plans for the future. Finally this study also contribute to the project management knowledge areas as students and other researchers can refer it for further research.

1.6. Scope of the Study

Cost overrun in building construction projects are caused by many factors. Each causes of cost overrun have different rates of occurrences and their impact on the final cost of the construction project also varies. Therefore, it is important to identify both key causes of cost overrun based on their occurrence and their impact on building construction projects.

The scope of the study was limited to causes of cost overrun on public building construction in southern Nation Nationalities and peoples regional states in WolaitaSodo Town. This study was delimited to the causes of cost overrun on public building construction projects based on the variables of sociopolitical factors, economic factors, managerial factors, construction techniques and design change and timeliness of payment and financial factors.

1.7. Organization of the Thesis

This thesis constitutes five chapters. In the first, introductory chapter including subtopics that are discussed include: background, statement of the problem, objectives of the study, research questions, significance and scope and organization of the thesis. The second chapter elaborates a review of some theoretical review include overviews of cost overrun, factors influencing cost overrun such as socio political, economic, managerial, timelines, construction techniques and design change and empirical review includes review in cross country, in Africa and in Ethiopia. Chapter three included research methodologies such as research design, research approach, data

source, sample and sampling techniques, sample size, data collection tools, data analysis method, model specification and explanation and validity and reliability test. The findings, results and discussions are presented in chapter four. Finally, chapter five deals with the conclusion and recommendation that are drawn from the study.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical review

2.1.1. An overview of construction projects

A project is a temporary endeavor undertaken to create a unique product, service or result (Project Management institute, 2008). According to Hillson D., (2009), all projects are risky and there are three separate reasons for that. The first reason is that all projects share common characteristics which inevitably introduce uncertainty. Some of this common characteristics are projects are unique, complex, involve assumptions and constraints, performed by people and involve change from a known present to an unknown future. The second reason is that all projects are undertaken to achieve some specific objectives. The final reason is that all projects are affected by the external environment they exist in. A construction in simple words is a process of constructing something by human for one purpose or another. It may be a road, bridge, a dam, a private residence, an airport, a commercial building, office and etc. According to Wikipedia, construction is a process that consists of the building or assembling of infrastructure. Construction is the recruitment and utilization of capital, specialized personnel, materials, and equipment on a specific site in accordance with drawings, specifications, and contract documents prepared to serve the purposes of a client.

According to Nafishah B., (2006), a building construction project, like any other project, also faces different risks throughout the life of the project. This is due to the uniqueness of every project, the uncertainties introduced by the project stakeholders, statutory or regulatory protocols and other intrinsic and extrinsic constraints. He further discusses that risk can constrain the achievement of key project objectives, time, cost and quality. Inability to achieve the project objectives has great consequence on all project stakeholders involved in the construction. For the client it could mean extra cost and less return on investment, for the consultants it could result in loss of confidence placed in them by the clients, for the contractor it could mean loss of profit and bad reputation.

Enshassi et al., (2015) unlike the developed countries, Kenya does not have a mature construction industry consisting of well-established contracting and consulting companies. Much of the building and construction is done by the informal sector. This consists of individuals building family shelters, business premises among others. The formal sector consists of public and private domestic contractors The Government of Kenya and its development partners continue to allocate huge financial resources to finance infrastructure development. However, the intended benefits are partly or never realized due to many unsuccessful project implementations.

The construction sector is one of the most important contributors for the political, economic, social and technological development of one country. Existing facts show that about 50% of the Federal capital budget of Ethiopia is routed to the development of physical infrastructure, from this nearly 33% were for the road projects. Besides, the involvement of the private sector as the partners in the capital investment, increased capital investment in the field, as well as, promote more advanced technologies and materials W. Turkey (2011).

This sector is significantly increased both in volume and density of work seen in construction of Ethiopia. A number of studies in the public sector show that more than 80% of the construction projects are delayed run over budget and/or lack the management. The weakening quality of construction works is also clearly superficial. While the understanding of the construction projects indicate that, the construction project and management is high-value, time bound and predetermined performance under the management of the time and progress, cost and cash flow as well as quality and performance within the available organizational resources through planning and scheduling that resources. Mostly, Ethiopian road projects are financed by the Government and it is sensitive to the unpredictable costs. Whereas significant amount of capital is being invested in to infrastructure development, the infrastructure of the country is still considered to be very poor, when it compared with the standards of the Sub-Saharan countries Ashebir Shiferaw et al., (2017).

2.1.2. Factors that Influencing Cost Overrun

The most pronouncing problem in the construction industry is cost overruns. Cost overruns occur in every construction project and the magnitude of these cost overruns varies considerably

from project to project. So it is essential to define the actual causes of cost overruns in order to minimize and avoid the increasing cost in any construction project.

In this study the major factors for the occurrence of cost overrun in construction project are socio political, economic, timelines of payment, managerial and construction and design changes.

2.1.3. Socio Political factors

According to Markus and Tanis (2010), they revealed that socio political factors for cost overrun in construction project are due to political interference, political pressure at the time of project selection, political instability are the major causes cost overrun in construction project. Political interference plays a critical but poorly understood role in determining the success or failure of the processes of project management that dominate efforts to form international regimes or, more generally, institutional arrangements in international society. An examination of the nature of project management serves as a springboard both for pinpointing the role of leadership in regime formation and for differentiating three forms of leadership that regularly come into play in efforts to establish international institutions: structural leadership, entrepreneurial leadership, and intellectual leadership Holland et al. (2009).

The real work of regime formation occurs in the interplay of different types of leadership, the study of interactions among individual leaders is a high priority for those seeking to illuminate the processes involved in the creation of political movements. Politics manifests itself in all organizations as opinions and attitudes of the different stakeholders in these organizations. In addition, the stakeholders relied upon by the project may also have their own agenda and preferences for participating in the project. The relationships to the project by these stakeholders can vary from very supportive to antagonistic, but depending on their field of influence, must be considered and managed. However, neither the sponsor nor the project manager has control over external politics such as political turmoil which may disrupt the project Migai, (2008).

Jha and Iyer, (2006) the outstanding puzzle is how politicians are able to influence the bureaucratic arm of government, and raise bureaucratic productivity, to satisfy short-term electoral concerns. Typically, politicians do not under-take public projects themselves, but must delegate these tasks to bureaucrats, whom they then incentivize.

2.1.4. Economic factors

Chism and Armstrong (2010) confirm the fact that the political environment affects the construction of a project. Fortune and White (2014) in their review of sets of critical success factors in sixty-three publications listed political stability as one of the twenty-seven critical success factors. Wideman (1986) assert that changes in government actions are a major external risk factor militating against the success of projects. Economic environmental considerations refer to the level of general economic activity and resources available to carry out construction work.

Koushki and Kartam (2004) identify twenty-five such factors that could impact on construction time. These applications include the availability of materials; the availability of equipment; the availability of trades, operatives, the availability of supervision, management staff, as well as the indirect impact of interest rates, inflation and insolvency, and bankruptcy. Economic influence has two levels: first, the internal economics principle relating to the viability of a project holds that unless there is a net gain there is no point in even considering embarking on a project.

Memo, Rahman and Azis (2012) investigated the variation and claims in construction projects in Dubai and Abu Dhabi in the United Arab Emirates using 124 claims related to can be little more specific the range of the projects or typical project. He concluded that 1) a reasonable time should be allowed for the design team in order to reduce clear and complete contract documents with no or minimum errors and discrepancies; 2) efficient quality control techniques and mechanisms need to be established to minimize errors, mismatches, and discrepancies in the contact documents; 3) special contracting provisions and practices need to add in contract document and a strategy needs to introduce to deal with tighter scheduling requirements.

Alaghbari (2014) found several causes of delay in Saudi construction projects and they are drawing preparation, approval of design, payment delay, changes in design, slow cash flow, design errors, labour shortage.

Al- Moumani (2000) conducted a qualitative analysis of construction delays by examining the records of 130 public building projects constructed in Jordan during the period 1990-1997 where the frequencies analysis method was used to identify the main causes of delay from the survey records. The result of the analysis exposed that the main causes of delay in construction

projects were relate to designer's user, changes weather, site conditions, late deliveries, economic conditions and increase in quantities.

2.1.5. Timeliness of payment and financial factors

Weiss & Potts, (2012) a common issue in worldwide construction companies is to complete projects both on time and within the budget initially planned. The completion of projects in a timely manner is often a critical factor and measure of project success. In recent years, there has been an increasing interest in the use of projects as building blocks in the strategic management of organizations.

Seddon, (2008) the success of any project is highly dependent on its completion time and cost from start to delivery of results. This has a direct bearing on management decisions such as budgets, targets and standards.

Frimpong, Oluwoye and Crawford (2003) illustrated the relationship between project cost and planning input in the timely completion of construction projects. Essentially, the availability of funds targeted at a particular project activity is a measure of project success, especially for activities in the critical chain. In a study to determine how District hospitals in Ghana cope with the untimely release of funds, Atkinson, (2006) noted that this created serious cash flow problems for the district health managers that disrupted the implementation of health activities and demoralized the district health staff.

However, based on their prior knowledge of when funds were likely to be released, district health managers adopt a range of informal mechanisms to cope with the situation. These mechanisms include obtaining supplies on credit, borrowing cash internally, pre-purchasing materials, and conserving part of the fourth quarter donor-pooled funds for the first quarter of the next year. Although these informal mechanisms have kept the district health system in Ghana running in the face of persistent delays in funding, some of them are open to abuse and could be a potential source of corruption in the health system. The untimely release of funds, particularly during the first phase of the project, is a significant barrier to effective project delivery especially where new project staff must be recruited and prerequisite field supplies purchased to kick-off project activities. The need for timely releases of funds has also been stressed Flyvbjerg, Skaris and Buhl (2004).

Al-Tabtabai (2002) conducted a study on causes of delays in construction projects in Kuwait and found out that the major causes of delay were: Slow financial and payment procedures; Slow decision-making process; Limited authority among supervision staff; Risk allocation mainly on the contractor; and Lack of design drawings coordination.

Memon, Rahman and Azis (2012) conducted a study on time and cost performance in construction projects in Malaysia and revealed that only 21% of public sector projects and 33% of private sector projects were completed within time.

The results of the study showed that the most important delay and cost overrun factors were: Design and Documentation Issues; Financial Resource Management; Project Management and Contract Administration; Contractors Site Management; and Information and Communication Technology.

Owolabi et al. (2014) studied the causes and effects of delay on project construction delivery time in Nigeria. They stated that seven out of ten projects in Nigeria suffered delays and cost overrun in their execution. The results of the study indicated that the following were the five major causes of delay: Lack of funds to finance the project to completion; Changes in drawings; Lack of effective communication among the parties involved; lack of adequate information from consultants; and slow decision making.

2.1.6. Managerial factors

Shanmuganathan and Baskar, (2015), Singh et al. (2011) , mentioned that the junior factors cause cost overruns in India are uncompleted initial designs and poor contracts, ineffective construction management, poorly established cost control systems, poor project (site) management, poor cost control, additional work, Improper planning and changes or discrepancies which occur during the construction period.

Gajewska, and Ropel, (2011) stated that the delay in diction making, miscalculation, and not finding the right contractor are the most influencing factors of delay the construction projects which leading to cost overrun occurrence in Sweden.

2.1.7. Construction Techniques and Design Changes Factors

Memon et al, (2011), Toh et al, (2012) and Abd-Karim et al, (2013) mentioned that client requirements on quality, poor design and delays in design, unrealistic contract duration and requirements imposed lack of experience, late delivery of materials and equipment, relationship between management and labor, fluctuation of prices of materials, cash flow and financial difficulties faced by contractors and shortages of materials are the most influencing factors in cost overrun in Malaysia.

In a research conducted by Ikediashi et al., (2014) on construction projects, they concluded that design discrepancies and frequent design changes are the most important factors resulting into cost overrun, and ultimately leads to complete failure of projects in Saudi Arabia.

In another study, Cheng (2014) asserted that most significant factors for cost overrun include the unclear and poorly defined scope of the project, numerous modifications to the scope, and unclear drawings/guidelines/regulations. These factors lead to design changes at any stage of a project thereby resulting in some reworks and do affect not only the cost but also have a diminishing return effect on the morale of workers.

Ibbs (2005) emphasized the substantial loss of labor productivity due to design changes and eventually resulting in cost overrun and delay. The conclusion was based on the author's evaluation of 162 construction projects in the USA.

Similarly in another study conducted by Hanna (2004) in USA, frequent design changes in electrical and mechanical construction component also resulted into loss of labor productivity. Apart from productivity issues, design changes also increase indirect cost due to the later events of claims and disputes during the projects.

Ayininuola and Olalusi (2005), the frequent changes in the design were associated with a change in scope of work by owners. This resulted in significant causes of the high incidents of building failures in Nigeria.

Kazaz et al., (2012) conducted study in Turkey, they found that design and material changes are the most predominant factor which is negatively impacting the project performance and needs to be effectively managed at the start of the project.

Olawale and Sun (2010) in a research conducted in the United Kingdom, they finding stated that revolves around design changes, uncertainties within construction not pre-assessed, complexities in the project, inaccurate determination of project cost, time, and nonperformance of the contractors.

2.2. Empirical review

2.2.1 Empirical review in cross country

Moms (2000) studied the factors influencing cost overruns in public sector projects; he found that inadequate project preparation, planning, implementation and delay in construction, supply of raw materials and equipment by contractors, change in the scope of the project, resources constraint, delays in decisions making by government, failure of specific coordinating bodies was the filth factor, wrong /inappropriate choice of site, technical incompetence and poor organizational structure, labor unrest, natural calamities, like war and lack of experience of technical consultants, inadequacy of foreign collaboration agreements, and monopoly of technology.

Bubshait and A. Juwait (2015) stated on factors that cause cost overrun on construction projects in Saudi Arabia; the finding shows that the factors of cost overrun on construction projects such as effects of weather, number of projects going on at the same time, social and cultural impacts, project location, lack of productivity standards in Saudi Arabia, level of competitors, supplier manipulation, economic stability, inadequate production of raw materials by the country, absence of construction cost data.

Kaming et al., (2007) examine the factors influencing construction cost overruns on high rise projects in Indonesia, They found that cost overruns occur more frequently and thus are more severe problem than time overruns on high-rise construction in Indonesia. The predominant factors influencing cost overruns are material cost increases due to inflation, inaccurate materials estimating and degree of project complexity, inaccurate materials estimates, complexity of project, contractor's lack of geographical experience, contractor's lack of project type experience, and non-familiar with local regulations.

Le-Hoai, et al., (2008) ranked the three fop causes of cost overruns in Vietnam as material cost increase due to inflation, inaccurate quantity take off and labor cost increase due to environment restriction.

Kaliba, et al., (2009) conclude that cost escalation of construction projects in Zambia are caused by factors such as inclement weather, scope changes, environment protection and mitigation costs, schedule delay, strikes, technical challenge and inflation.

Koushki, et al., (2005) the amount of cost- increase (overruns), increased with an increase in the total cost of a residential project. However, private residence owners who spent more time on the preplanning phase spent more money on the design phase; issued less change orders; selected more experienced contracting companies, and hired supervising engineer to independently supervise the progress of work and ensure the delivery of materials experienced less and cost increases during the implementation phase of their residential projects. A major factor contributing to the sample projects' and cost increase was the insufficiency of money and time allocated to its design phase

Other studies Datta (2002), Schexnayder et al. (2003), identified cost escalation to be a result of problems such as delay in land acquisition, unexpected problems in supply of raw materials, illegal encroachment on land even during project implementation, or due to internal problems in government organizations.

Azhar et al. (2008), Mahamid and Bruland (2011) they study is based on data relating to residential construction projects in Turkey; classify factors affecting cost overruns into 3 and 4 groups: macroeconomic factors, management factors and business and regulatory environment. On the other hand, group sub-factors influencing cost overruns in road construction projects under 4 main factors: financial, construction parties, construction items, environmental and political group of factors. As highlighted before, past studies have identified various factors affecting cost overruns in construction projects; this study aims to contribute to filling the gaps by prioritizing factors in terms of their levels of impact in the perspective of the project management consultants, contractors and owners/clients.

Tejale Khandekar (2015) carried out a study on analysis of project cost overrun by statistical methods in Pune region in India. Their survey identified 45 common factors causing cost overruns which they ranked based on relative important index value computed on each group of respondents. The ten most factors based on the ranking were material shortage, shortage of labor, late delivery of materials and equipment, unavailability of competent staff, low productivity level of labors, quality of equipment and raw materials, delay in progress

payments, financial difficulties by contractor, poor site management, escalation and fluctuation of material prices and poor communication and coordination by owner and other parties.

Singh, (2009) in his study of extent and causes of cost overruns in 850 infrastructure projects in India; divided the causal factors in four categories; technical and natural factors, contractual failures, organizational or institutional failures and economic factors. Included in the technical and natural factors are the cost estimation techniques, technological and material requirements as well as natural factors such as flood and other natural conditions. The contractual failures relate to the ability of the contract to specify every detail of the works that are to be performed by the contractor' in each possible scenario. He refers to this as 'complete-contingent- contracts. He however notes that in reality it is difficult to develop a contract that describes in detail every possible scenario that may occur during the implementation of the project. This makes the construction contracts intrinsically 'incomplete'. The 'incompleteness' varies as the project complexity increases. Organizational or institutional failures refer to cooperation of several departments within and among various ministries. The hierarchal relationships within these organizations and conflicts between the individuals and the social objectives within the organization mean that the projects have to face the consequences of many sources of failures within the sponsoring organizations. Included in the economic factors are the state of other infrastructural development and income level.

Brunes et al., (2014) while undertaking survey of 230 participants drawn from the Swedish Transport Administration and three large construction companies in Sweden; narrowed down the factors to only three; design of the project, misjudged price changes and unexpected technical problems that were difficult to predict. With a response rate of 42%, 65 % of the respondents ranked design changes as significant while 64% attributed cost overruns to technical problems. Only 20% recorded changes in input prices as a major cause of cost overruns. In their book titled "Understanding and Monitoring the Cost-determining Factors of Infrastructure Projects: A User's Guide", the European union identified design changes, land acquisition problems, poor project management, unexpected ground conditions, inflation, difficulties with contractor, funding problems, exchange rates, shortages of material as the main cost changing factors.

These findings are in agreement with Mukuka, Aigbavboa and Thwala (2015. who identified major causes of cost overruns as cost of materials, incorrect planning and wrong method of estimation, poor contract management, and fluctuation of prices of materials. Other factors

included environmental factors, construction factors such as design changes, cost estimating factors and financing factors.

2.2.2. Empirical review in Africa

Chileshe and Berko (2010) staded in Ghanian road sector, they concluded that delays in monthly payments to contractors; variations, inflation, and schedule slippage as significantly important. They identified other factors as poor communication, technical complexity and size of the project as not very important but of concern.

According to Chimwaso (2009), the major factors for cost overrun are design changes, inadequate planning, unpredictable weather conditions; and fluctuations in the cost of building materials, incomplete design at the time of tender, additional work at owner's request, changes in owner's brief, lack of cost planning/monitoring during pre-and-post contract Stages. site/poor soil conditions, adjustment of prime cost and provisional sums, re measurement of provisional works, logistics due to site location, lack of cost reports during construction stage, improvements to standard drawings during construction stage, indecision by the supervising team in dealing with the contractor's queries in delays, delays in costing variations and additional works, omissions and errors in the bills of quantities, ignoring items with abnormal rates during tender evaluation, especially items with provisional quantities, some tendering man works by contractors, such as frontloading of rates.

A similar study by Muianga, et al., 2015) in Mozambique identified 95 factors which they classified into eleven categories namely government relations, contractual issues, organization, management, financing, design and documentation, schedule and control, scope changes, environment, economy materials, labor and equipment.

Mwandali (2009) focused on factors that affect project management in Kenya Railway projects. Factors ranging from inflation, project complexity, inaccurate material estimation, financing, change orders, design changes, late submission of drawing, poor specification, incorrect site information, poor contract management among many others were found to be main sources of overruns.

EL-Kholy (2015) a study on 30 construction projects in Egypt by identified 44 factors contributing to high cost overruns out of which 11 factors emerged as significant with a Relative Importance Weight (RIW) of more than 10. These are financial condition of owner,

cash flow of contractor, method of procurement, Inflation, competition at tender stage, Currency of contract, project size, delay in design and approval risk retained by client for quantity variations, quality of drawings, and inadequate material testing. Interestingly while other studies have highlighted such factors as design changes, project complexity and weather conditions as significant factors, these factors are ranked low in this research differing from the findings by other researchers.

Aftab et al., (2010) conducted on factors affecting construction cost in Mara Large Construction Project: they concluded that cash flow and financial difficulties faced by contractors, contractor's poor site management and supervision, inadequate contractor experience, shortage of site workers, incorrect planning and scheduling by contractors are most severe factors while changes in scope of project and frequent design changes are least affecting factors on construction cost. Spearman correlation analysis showed that incorrect planning and scheduling by contractor has strong positive relationship with contractor's poor site management and supervision, inadequate experience of contractors has strong positive relationship with incorrect planning and scheduling; and contractor's poor site management and supervision, changes in scope of project has strong positive relationship with frequent design changes; and vice versa.

2.2.3. Empirical review in Ethiopia

Kassaye Tsiga, (2018) they study conducted on assessment of factors affecting cost overrun of road Construction Projects, the case of Ethiopian Construction Works Corporation, Transport Infrastructure Construction Sector; the study identified causes of cost overrun for the case of Ethiopian Construction Works Corporation, Transport Infrastructure Construction Sector. The most important causes of cost overrun were found to be ineffective way of management of Material and Machinery resources at project (3.56), Skill of Site Management Crew (3.53), wrong method of System/Approach employed to manage site activities (3.44), contract management (Inadequate knowledge and skills of Project Management and Contract Administration teams) (3.43) and Design errors (3.4) are the five most important factors affecting cost of construction projects.

A study conducted by Nega (2008) on predominant factors for cost overrun in public building construction projects are identified the following major cost overrun factors. These are inflation or increase in the cost of construction materials, poor planning and coordination, change orders due to enhancement required by clients, and excess quantity during construction.

Teshome Regassa, (2019) conducted on determinants of timely completion of road construction project; the case of road construction projects under defense construction enterprise; the result determined that the delay factors such as improper project planning practices, poor project monitoring practices, poor leadership skills, ineffective procurement process, poor top management support and financial problems as internal factors, and political situations, local community obstructions, frequent changes in scope and economic factors), improper project planning practices was identified and concluded as the determinants with the highest influence on project completion delay.

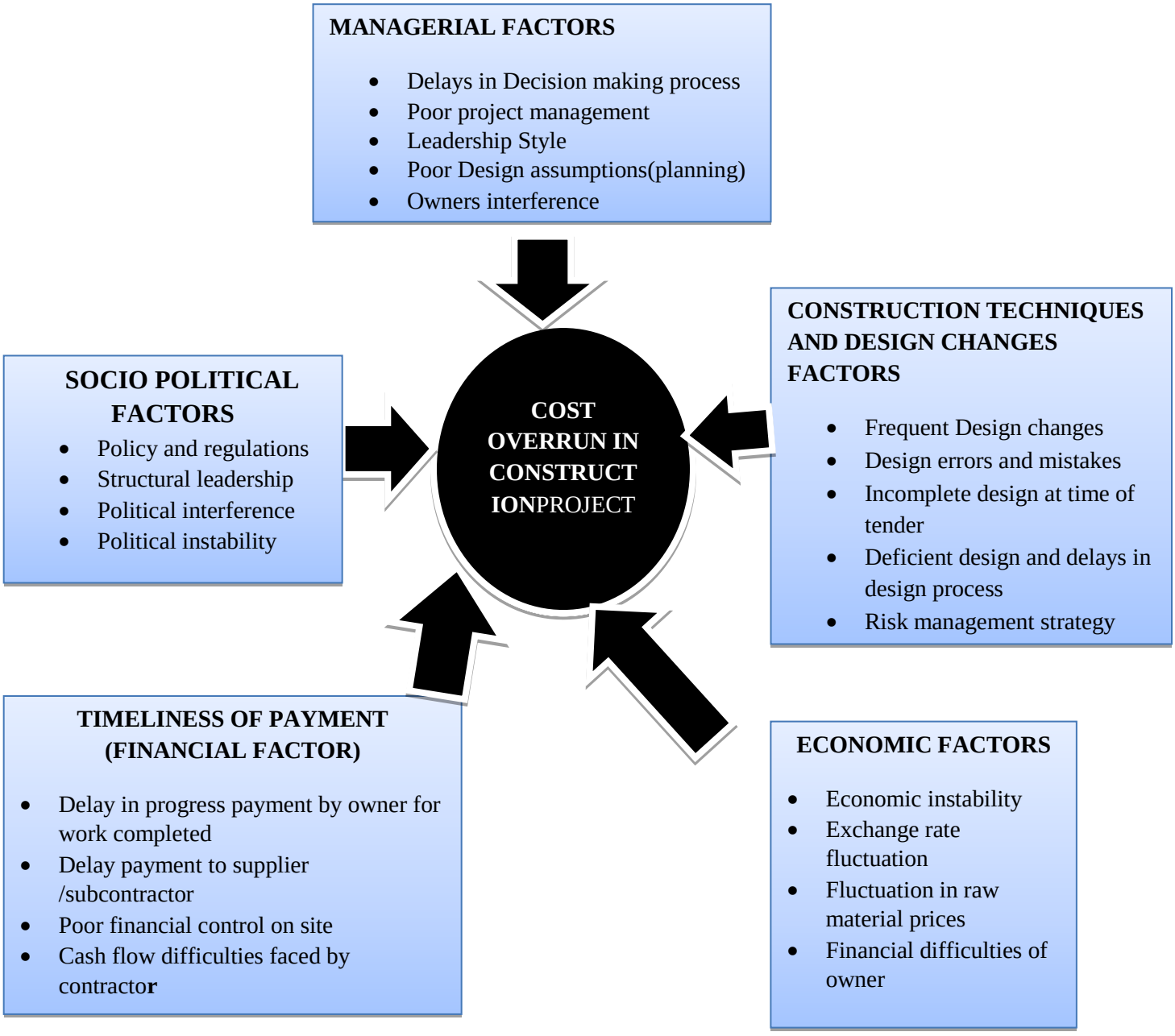
Yenealem Fentahun, (2018), determinants of infrastructure project delays and cost escalations. The Case of Road and Rail Construction Projects in Ethiopia; From the analysis it was found that 88% of road and 100% rail construction projects suffered time performance, and 80% of road and 100% of rail projects also cost overruns. From these identified and ranked 38 determinants five top extension of time and 4 escalation of cost are selected for discussion. Factors which affected time performance were: incomplete study prior to project approval, poor project management and coordination, right of way issues, inaccurate forecasting of schedule, overconfidence and interest of project stakeholders. Whereas the extremely significant factors affecting cost performance were; inflation of material cost, scope change with change order, incomplete study project approval, poor bill of quantity and design, and poor project performance monitoring. Cost and time overruns of Federal road and rail projects have affected key stakeholders in particularly and on the economy of the country generally. Time and cost overrun added in estimated time and cost over and above initial agreed upon on set, this damages client and contractor reputation, loss of profit and investment opportunities, inability to deliver value of money and inefficient use of time, disposing business activities and create burden for taxpayers.

Shambel Gebrehiwot (2018) conducted on Factors influencing Time and Cost Overruns in Road Construction projects; they finding indicted that improper planning, land acquisition and construction delay, design changes, less materials and equipment supply by contractors, incomplete design are the main sources of delay and cost overrun respectively.

2.3. Conceptual Framework

The Conceptual Framework gave a depiction on how the variable related to one another. The variable defined here are dependent and independent variables. An independent variable affects and determines the effect of another variable Mugenda, (1999). The independent variables in this study are socio political factors, economic factors, managerial factors, timeliness of payment (financial) and construction techniques and design change.

Figure 1 Conceptual frame work



2.4. Knowledge Gap Identification

Construction building projects are notorious for failing to complete in time being over budgeted, late and saddled with scope creep, as well as for poor communication protocols and inadequate controls around scope change management this especially pronounced in nonprofit organizations (Guerin, 2012). Timely and within budgeted completion of construction project is fundamental if the project objectives and success is to be achieved. A project that is completed in cost exhibits overall efficiency of project planning, management and implementation and effective tracking project progress.

Little study had been carried on the causes of cost overrun on public building construction projects by construction organizations which are inconsistent. This study sought to fill this research gap by investigating cause of cost overrun on public building construction projects: A Case Study of selected Government Construction Projects in WolaitaSoddo town.

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

This part aims at elaborating the methodological process that is used, it outlines how the research was conducted based on the objective of the study. It is organized in the manner of limitation, research design, target population, sampling strategy, data collection tools and techniques, and data analysis used in the study.

3.2. Research Design

The research is a practical problem developed from the observation of construction projects and the research questions are oriented to investigate the cause of cost overrun. This study used descriptive type of research design. Descriptive type of research design was used because this method or type of research is commonly conducted to collect detail description of existing phenomena with the intent of employing data to justify current conditions and whenever possible to draw valid general conclusions from the facts discovered.

3.3. Research Approach

This study was uses quantitative research methods. Quantitative research is used to answer questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomena (Leedy and Ormrod, 2001, p. 101). The use of quantitative strategy of inquiry is necessary when the researcher wants to detail investigate and analyze an event, program and problem very well. The researcher bases the inquiry on the assumption that collecting diverse types of data best provides on understanding of a research problem. In these situations the advantages of collecting closed-ended quantitative data prove advantageous to best understand a research problem (Creswell, 2003).

3.4. Data Sources and Collection Tools

The data employed in this study was primary source. In order to collect primary data, the researchers used closed-ended questionnaire. The secondary data sources, specifically for literature reviews, for supporting research findings, articles, reports and other related

publications on cost overrun on public buildings projects were also used as secondary data source. For data process and procedures, this study were used a five point Likert scale in order to determine the causes of cost overruns in construction project in Wolaita Zone Sodo Town, with regards to the identified factors from the reviewed literature. The adoption scales are as follows: strongly disagree, disagree, neutral, agree and strongly agree.

3.5. Target Population

Population is the entirety of the individuals, items, events or objectives, which possess some unique characteristics that the author is interested in studying (Mugenda, A. G. and Mugenda, M. O., 1999). Sounders, *et al.,* (2009) contend that it is from the population that the researcher draws a statistical sample for the survey. A population can also be conceptualized as the entirety of collected units upon which the study conclusions are drawn. The target population in this study was public construction project in Wolaita Sodo town.

3.6. Sample and sampling techniques

The sampling techniques used in this study were judgment sampling technique. Judgmental sampling is a form of convenience sampling in which the population elements are selected based on the judgment of the researcher. The researcher, by exercise judgment of expertise, chooses the elements to be included in the sample because he or she believes that they are representative of the population of interest or otherwise appropriate (Naresh, 2007, p. 390).

3.7. Sample Size

Since the number of population was small in number, the researcher used judgmental sampling. The total sample size was the total target population of project category such as building, water project and infrastructure like cobblestone paved road.

Table 3 1 Sampling frame and Sample size

Project category	Population(N)	Sample size
Buildings	11	11
Water projects	3	3
Cobblestone paved road	8	8
Total	22	22

Source: Survey outcome and own computation 2020

Determination of the sample size, the total populations of respondents is 22. Therefore, the researcher used 100% of the total population for sample size and to distribute questionnaire for the number of participants in this study.

3.8. Data collection Instruments

The main tools of data collection for this study were questionnaires. The questionnaire was used for data collection because it offers considerable advantages in the administration. It also presented an even stimulus potentially to large numbers of people simultaneously and provides the investigation with an easy accumulation of data. Gay (1992) maintains that questionnaires give respondents freedom to express their views or opinion and also to make suggestions.

3.9. Data collection Procedures

The first action that to actual data collection the researcher were take a letter of introduction to collect data from the university; to carry out a study the researcher starts to request those concerned body to give permission to conduct the approved research. The researcher then sought a permit to carry out the empirical research from the study area. The researcher then proceeded to inform the management body of the Wolaita ZoneSoddoTown and the institutions about the intended research area.

This study was administer the questionnaires to the respondents and conducted interviews with the assistance of trained research assistants and the data for the study was obtained from primary. Questionnaire and other data collection methods were done through consultations with the advisor. This was to establish any built-in errors in the measurement of the questionnaire.

According to (Leed&Ormrod, 2005) data is said to be primary if it is collected firsthand by researcher for a determined purpose. The primary data were collected by using of semi-structured questionnaires that administer to select respondents. The respondents were expected to possess the requisite knowledge of the subject matter.

3.10. Data Analysis Methods

The data analysis in this study was Descriptive analysis and multi linear regression model were used to identify factors affecting cost overrun. The analysis was performed with SPSS Statistics

(Statistical Package for Social Sciences Version 20.0). Besides, measures of central tendency mean, frequency, percentage and statistical relatively important index (RII) was used to analyze the data gathered through the questionnaire. Finally, the results were presented using tables.

As discussed earlier Likert's scale of five ordinal measures of agreement towards each statement (1, 2, 3, 4 and, 5) was used to calculate the mean score for each factor that is used to determine the relative ranking. The Relatively Important Index (RII) for each variables of cost overrun was computed by using the following formula;

$$RII = \frac{\sum W}{A \times N},$$

Where, RII = Relative importance Index

W= weighting given to each factor by respondents and it ranges from 1 to 5

A= Highest weight (i.e. 5 in this case)

N= Total number of participants

3.11. Model Specification and Explanation

In this thesis, multiple regression models with various independent variables were used.

The regression analysis will be conducted to find out the following:

Depending on the theoretical model and the measurements of the variables, the empirical model that this study employs is given by:

$$COR=\beta 0+\beta 1SPF+\beta 2EF+\beta 3MF+ \beta 4TPFF+ \beta 5TPFF +\varepsilon \quad (1)$$

Where;

COR= Cost overrun

SPF= Socio political Factor

EF=Economic Factor

MF= Managerial Factor

TPFF= Timeliness of payment and financial factor

CTDF= construction techniques and design factor

ε =error term

β= coefficient

Finally, εis the disturbance or error term, which expresses the effect of all other variables (variables that are not included in the function) except for the independent variables on the

dependent variable that the researcher use in the function. The cases of cost overrun on construction project were analyzed using the regression analysis SPSS output.

3.12. Validity and Reliability Test of Over All Factors of the Model

Validity and reliability issues are used for checking whether cost overrun is occurred or not. Validity of the questionnaire and other data collection methods will be done through consultations with the advisor. This was to establish any built-in errors in the measurement of the questionnaire.

Table 3 2 Reliability Statistics of the cases of cost overrun

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	**.880**	**22**

Source: SPSS result of the own survey 2020

CHAPTER FOUR

4. Data Presentation, Analysis and Interpretation

4.1. Introduction

This chapter presents the research results and findings of the study on causes of cost overrun on public building construction projects; a case study in Wolaita Sodo town. The research presented the analysis and interpretations of data more scientifically. Researcher suitably drawn the results from his research are highly appreciable. Besides percentage analysis, other relevant statistical tools and statistical relatively important index (RII) are also used.

Response Rate = Number of Surveys Completed /Number of People Contacted

= 22/22×100

= 100%

4.2. Demographic Characteristics of the Respondents

The respondent involved in the survey had several year experiences in handling various types of construction project. The demographic characteristics of the respondents participated in survey are as follows.

4.2.1. Location of the project

Table 4. 1 Location of the project.

Location

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Wolaita	22	100.0	100.0	100.0

Source: SPSS result of the own survey 2012

Based on table 4.1 indicted that 100% of the respondents response are indicated the building construction projects are located wolaita Sodo.

4.2.2. Organizational type

Table 4. 2 Indicate Types of Organization

please indicate your types of organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Contractors	20	90.9	90.9	90.9
	Consultants	2	9.1	9.1	100.0
	Total	22	100.0	100.0	

Source: SPSS result of the own survey 2020

In terms of organizational type the above table 4.2 indicted that 90.9% and 9.1% of the respondents are indicated contractor and consultant respectively. This implies that the majority of building construction projects is run by contractors.

4.2.3. Job Designation

Table 4. 3 indicate job designation

please indicate your job designation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Resident engineer	2	9.1	9.1	9.1
	project Manager	9	40.9	40.9	50.0
	office engineer	5	22.7	22.7	72.7
	site engineer	6	27.3	27.3	100.0
	Total	22	100.0	100.0	

Source: SPSS result of the own survey 2020

In terms of job title the above table 4.3 indicted that 9.1%, 40.9%, 22.7% and 27.3% of respondents are indicated resident engineer, project manager, office engineer and site engineer respectively.

4.2.4. Construction type

Table 4. 4 Indicate Construction Type

Please indicate your industry type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Superstructure	7	31.8	31.8	31.8
	Infrastructure(water, road)	15	68.2	68.2	100.0
	Total	22	100.0	100.0	

Source: SPSS result of the own survey 2020

In terms of construction type the above table 4.4 indicted that 31.8% and 68.2% of respondents are indicated superstructure and infrastructure types of project respectively. This reviles that in public construction the majority types of projects are infrastructure types of projects.

4.2.5. Size of project in terms of employee

Table 4. 5 indicates the size of employee

what is the size of your company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	large (>250 employee)	5	22.7	22.7	22.7
	Medium (50 to 250 employee)	15	68.2	68.2	90.9
	small (10 to 50 employee)	2	9.1	9.1	100.0
	Total	22	100.0	100.0	

Source: SPSS result of the own survey 2020

In terms of size of the project related with the number of employees, 22.7%, 68.2% and 9.1% of respondents are indicated large, medium and small number of employees respectively. The finding indicts that the size of construction project in Sodo town are a medium size projects.

4.2.6. Work experience

Table 4. 6 work experience in construction project

How many years have you been working in construction projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 5 years	18	81.8	81.8	81.8
	6 to 10 years	4	18.2	18.2	100.0
	Total	22	100.0	100.0	

Source: SPSS result of the own survey 2020

In terms of work experience in construction project, 81.8% and 18.2% of respondents are indicated less than 5 years and 6 to 10 years of work experience respectively. This indicated that less work experience in building public construction project are cases for the occurrences of cost overrun.

4.3. Factors that Cause for the Occurrence of Cost Overrun

The researcher also moved to obtain relevant data with regard to the first research objective. Following is the presentation of the findings that were obtained. Respondents were also forwarded in terms of ranking factors causing cost overrun in public construction project.

Table 4. 7 Ranking the Factors that cause for the Occurrence of cost overrun

(Rank from 1-2=highest, from 3-5=medium, and from 6-7= lowest)

Item	Highest	Medium	Lowest	Mean	RII	Rank
Socio political factor	13.6	86.4	0	1.86	0.71	1
Economic factors	4.5	95.5	0	1.95	0.68	3
Managerial factors	4.5	95.5	0	1.95	0.68	3
Timeliness of payment	9.10	90.9	0	1.91	0.69	2

Source: Survey outcome and own computation 2020

As shown in the table 4.7 above, for socio political factors, 13.6% and 86.4% of the respondents indicated the highest and medium with mean scores of 1.86 and Relatively Important Index (RII=0.71).

Ranking for economic factors, 4.5% and 95.5% of respondents indicated the highest and medium with mean scores of 1.95 and Relatively Important Index (RII=0.68). Ranking for managerial factors, 4.5% and 95.5% of respondents indicated the highest and medium respectively with mean scores of 1.95 and Relatively Important Index (RII=0.68). Ranking factor for timeliness of payment and financial factor, 9.10% and 90.9% of respondents indicated the highest and medium respectively with mean scores of 1.91 and Relatively Important Index (RII=0.68). In general the above analysis indicated ranking result in accordance with respondents view the finding also reveal that socio political factors, economical factors, managerial factors and timeliness of payment are the major causes for the occurrences of cost overrun in public construction project.

4.3.1. Socio political factors

The survey result indicated the degree of agreement or disagreement to the statements affecting the socio political factors for the occurrences of cost overrun in construction project.

N.B On five point Likert scale: SA=strongly agree, AG = Agree, NU = neutral, DA= disagree, SD= strongly disagree)

Table 4. 8 Factors Indicating Socio political factors for the occurrence of cost overrun

Items	SA %	AG %	NU %	DA %	SD%	Mean	RII	Rank
Policy and regulations	9.1%	18.2%	0	27.3%	45.5	2.18	0.43	4
Structural leadership	13.6%	22.7%	22.7%	36.4%	4.5%	3.05	0.60	3
Political interference	9.1%	54.1%	27.3%	4.5%	4.5%	3.59	0.71	1
Political instability	22.7%	45.5%	4.5%	13.6%	13.6%	3.50	0.70	2

Source: Survey outcome and own computation 2012

The survey results indicated in the above table 4.8 shows that according to policy and regulation the respondent response 9.1% and 18.2% of respondents are indicted agreement and the rest 27.3% and 45.5% of the interviewers are disagreed with mean score of 2.18 and relatively important index (RII=0.43). The finding revealed that the change construction law (policy) and regulation are not causes for socio political factors with relatively important index and mean score.

According to structural leadership the respondent response is 13.6% and 22.7% of respondents are indicated agreement and the rest 36.4% and 4.5% of the respondents are indicated disagreement with mean score of 3.05 and relatively important index (RII=0.60). The finding revealed that the structural manager or structural leadership is not causes for socio political factors with relatively important index and mean score. This confirms that the structural manager tries to design and implement a process or structure that is appropriate to the problem and circumstances.

According to political interference the respondent response is 9.1% and 54.1% of respondents are indicated agreement and the rest 4.5% and 4.5% of the respondents are indicated disagreement with mean score of 3.59 and relatively important index (RII=0.71). The finding revealed that the political interference are the major causes for socio political factors with relatively important index and mean score. This confirms that political pressure can influence the selection of project. There is usually many more project seeking funding than available resources. In this case powerful politicians may push their pet projects to the front of the line

regardless of their economic merits. Under the implementation stage, public procurement may be a source of corruption when political pressure is asserted to influence the selection of bidder. This can lead to collusion and corrupt relationships between the bidder and their backers. Inappropriate funding models can also lead to poor infrastructure outcomes. This confirms that the interference of political pressure can be a major cause that leads to cost overrun.

According to political instability the respondent response is 22.7% and 45.5% of respondents are indicated agreement and the rest 13.6% and 13.6% of the respondents are indicated disagreement with mean score of 3.50 and relatively important index (RII=0.70). The finding reviled that the political instability are the major causes for socio political factors with relatively important index and mean score. This confirms that the instability of political situation can be a major cause that leads to cost overrun.

4.3.2. Economic Factors

The survey result indicated the degree of agreement or disagreement to the statements affecting the economic factors for the occurrences of cost overrun in construction project.

Table 4. 9 Factors Indicating Economic factors for the occurrence of cost overrun

Items	SA %	AG %	NU %	DA %	SD %	Mean	RII	Rank
Economic instability	27.3	27.3	4.5	31.8	9.1	3.32	0.66	3
Exchange rate fluctuation	13.6	86.4	0	0	0	4.86	0.82	2
Fluctuation in raw material price	100	0	0	0	0	5	1.00	1
Financial difficulties of owner	31.8	0	4.5	40.9	22.7	2.77	0.55	4

Source: Survey outcome and own computation 2020

The survey results indicated in the above table 4.9 shows that according to economic instability the respondent response 27.3% and 27.3% of respondents are indicted agreement and the rest 31.8% and 9.1% of the interviewers are disagreed with mean score of 3.32 and relatively important index (RII=0.66). The finding revealed that the economic instability are causes for economic factor with relatively important index and mean score. This confirms that the change in interest rate and market fluctuation are cause for economic instability this is also cause leads to cost overrun.

According to exchange rate fluctuation the respondent response is 13.6% and 86.4% of respondents are indicated agreement and the rest 4.86% of the respondents are indicated disagreement with mean score of 4.86 and relatively important index (RII=0.82). The finding revealed that most of the world currencies are bought and sold based on flexible exchange rates or price fluctuates based on the supply and demand in the foreign exchange market. A high demand for a currency or a shortage in its supply will causes an increase in price this is the hindering factor for exchange rate fluctuation and causes for the occurrences of cost overrun.

With regard to fluctuation in raw material price, 100% of respondent's response is indicated agreement with mean score of 1.00 and relatively important index (RII=1). The finding revealed that the fluctuation in raw material price are the major causes for economic factors with relatively important index and mean score. This confirms that the exchange rate fluctuation and price fluctuation are causes price fluctuation in construction raw material this is the major cause for the occurrences of cost overrun in construction project.

According to financial difficulties of owner the respondent response is 31.8% of respondents are indicated agreement and the rest 40.9% and 22.7% of the respondents are indicated disagreement with mean score of 2.77 and relatively important index (RII=0.55). The finding revealed that the financial difficulties of owner are not causes for economic factors with relatively important index and mean score.

4.3.3. Managerial Factors

The survey result indicated the degree of agreement or disagreement to the statements affecting the Managerial factors for the occurrences of cost overrun in construction project.

Table 4. 10 Factors Indicating Managerial factors for the occurrence of cost overrun

Items	SA %	AG %	NU %	DA %	SD %	Mean	RII	Rank
Delays in decision making process	9.1	50.0	4.5	27.3	9.1	3.23	0.64	4
Poor project management Leadership Style	59.1	27.3	0	13.6	0	4.32	0.86	2
Poor design assumptions (planning)	18.2	68.2	4.5	9.1	0	3.95	0.79	3
Owners interference	81.8	9.1	4.5	4.5	0	4.68	0.93	1

Source: Survey outcome and own computation 2020

The survey results indicated in the above table 4.10 shows that according to delays in decision making process the respondent response 9.1% and 50% of respondents are indicted agreement and the rest 27.3% and 9.1% of the interviewers are disagreed with mean score of 3.23 and relatively important index (RII=0.64). The finding revealed that the delays in decision making process are causes for managerial factors with relatively important index and mean score. This confirms that the delay is one of the leading issues often faced the construction project sites. Delays may result in negative influences such as increased costs, loss of productivity and revenue, claims between the holders and contractor and contract termination are implies delays of manager in decision making process this indicated challenges leads to cost overrun in construction project.

With regard to poor project management leadership style the respondent response is 59.1% and 27.3% of respondents are indicated agreement and the rest 13.6% of the respondents are indicated disagreement with mean score of 4.32 and relatively important index (RII=0.86). The finding revealed that the poor project management Leadership Style are causes for managerial factors with relatively important index and mean score. This confirms that poor planning and management of the construction projects may lead to several negative effects on the duration and completion of projects this implies the managerial factors are the hindering factors for the occurrences of cost overrun in public construction projects.

According to Owners interference the respondent response is 81.8% and 9.1% of respondents are indicated agreement and the rest 4.5% of the respondents are indicated disagreement with mean score of 4.68 and relatively important index (RII= 0.93). The finding reviled that the owner's interference are the major causes for managerial factors with relatively important index and mean score.

This confirms that every construction project needs the freedom to carry out the work without interference, an owners attempt to constrain the project this result in expensive delays and additional costs to the contractor this implies the major factors that affecting cost overrun in construction project.

4.3.4. Construction techniques and Design Factors

The survey result indicated the degree of agreement or disagreement to the statements affecting the Managerial and design factors for the occurrences of cost overrun in construction project.

Table 4. 11 Factors Indicating construction techniques and design factors for the occurrence of cost overrun

Items	SA %	AG %	NU %	DA %	SD %	Mean	RII	Rank
Frequent Design changes	4.5	54.5	9.1	22.7	9.1	3.23	0.64	5
Design errors and mistakes	18.2	31.8	18.2	31.8	0	3.36	0.67	4
Incomplete design at time of tender	9.1	77.3	9.1	4.5	0	3.91	0.78	3
Deficient design and delays in design process	50.0	31.8	13.6	0	4.5	4.23	0.84	1
Risk management strategy	27.3	54.5	13.6	4.5	0	4.05	0.80	2

Source: Survey outcome and own computation 2012

The survey results indicated in the above table 4.7 shows that according to frequent design change the respondent response 4.5% and 54.5% of respondents are indicted agreement and the rest 22.7% and 9.1% of the interviewers are disagreed with mean score of 3.23 and relatively important index(RII= 0.64) were ranked as the fifth factor. The finding reviled that the frequent design changes are causes for construction techniques and design factors with relatively important index and mean score. This confirms that the design change in construction project during post contract period the owner interaction to modify a design change to the scope of the work as defined by the contract document following the creation of legal relations between the principal and the contractor, the changes are not fault of the contractor but the design change may occur in architectural, structural, plumbing and drainage, site works or other aspects of construction are factors for the construction techniques and design change. Frequent design changes are the major factors for the occurrences of cost overrun.

According to design errors and mistakes the respondent response is 18.2% and 31.8% of respondents are indicated agreement and the rest 31.8% of the respondents are indicated disagreement with mean score of 3.36 and relatively important index (RII=0.67) were ranked as the forth factors. The finding reviled that the design errors and mistakes are causes for construction techniques and design change with relatively important index and mean score. This

confirms that the design errors and mistakes in the stages of construction project are cause that leads to cost overrun.

According to incomplete design at time of tender the respondent response is 9.1% and 77.3% of respondents are indicated agreement and the rest 4.5% of the respondents are indicated disagreement with mean score of 3.91 and relatively important index (RII= 0.78) were ranked as the third factors. The finding reviled that there is an error and mistakes in design development and documentation to define further the size and character of the project. It include architectural, civil, structural, mechanical and electrical system material and other such project components are incomplete that can be factors for construction techniques and design this is also causes for the occurrence of cost overrun.

According to deficient design and delays in design process the respondent response is 50% and 31.8% of respondents are indicated agreement and the rest 4.5% of the respondents are indicated disagreement with mean score of 4.23 and relatively important index (RII = 0.84) were ranked as the first factor. The finding reviled that Deficient design and delays in design process are the major causes for construction techniques and design factors with relatively important index and mean score. This confirms that poor design and documentation quality are the major causes of construction process inefficiency, leading directly to delays rework and variation and contributing to increasing in project time and cost this implies the deficient design and delays in design process are the major factors the contribute for the occurrences of cost overrun in construction project.

According to risk management strategy the respondent response is 27.3% and 54.5% of respondents are indicated agreement and the rest 4.5% of the respondents are indicated disagreement with mean score of 4.05 and relatively important index (RII = 0.80) were ranked as the second factor. The finding reviled that Risk management strategy ranked as the first factor affecting cost overrun in the factors related to construction techniques and design with relatively important index and mean score. This confirms that risk management strategies should be applied to all level of the project to avoid cost overrun, implementing a risk management plan at the beginning of the a project can help to remove some of the possible problems that can appear during project life cycle, so manager should apply risks management skill to avoid any cost problems.

4.3.5. Financial and Time lines of payments

The survey result indicated the degree of agreement or disagreement to the statements affecting the time lines of payments and financial factors for the occurrences of cost overrun in construction project.

Table 4. 12 Factors Indicating Time lines of payments and financial factors for the occurrence of cost overrun.

Items	SA %	AG %	NU %	DA %	SD %	Mean	RII	Rank
Delay in progress payment by owner for work completed	18.2	31.8	22.7	27.3	0	3.41	0.68	2
Cash flow difficulties by clients	13.6	22.7	18.2	45.5	0	3.05	0.61	3
Poor financial control on site	27.3	36.4	9.10	22.7	4.5	3.59	0.72	1
Financing and payments of completed project	9.1	22.7	18.2	18.2	31.8	2.59	0.52	4

Source: Survey outcome and own computation 2020

The survey results indicated in the above table 4.12 shows that according to delay in progress payment by owner for work completed the respondent response 18.2% and 31.8% of respondents are indicted agreement and the rest 27.3% of the interviewers are disagreed with mean score of 3.41 and relatively important index (RII = 0.68) were ranked as the second factors. The finding reviled that Delay in progress payment by owner for work completed are the second factor affecting cost overrun in the factors related to time lines of payment and financial factors with relatively important index and mean score. As it's been stated that in the contract the client should pay a payment to the contractor according to the progress of work, and the payment it should be monthly or according to the contract. The client should pay contractors claims timely to avoid any cost overrun in construction projects. poor financial control on site was ranked as the first factor leads to cost overrun with mean score of 3.59 and relative important index (RII=0.73). Cash flow difficulties by clients was ranked as the third factor influencing cost overrun in financial factors with mean score of 3.05 and relative important index (RII=0.61). Financing and payments of completed project was ranked as the forth factor influencing cost overrun in financial factors with mean score of 2.59 and relative important index (RII=0.52). The finding reviled that financing and payments of completed project are not factors related to time lines of payment and financial factors for the occurrences of cost overrun.

4.4. Regression Analysis and Discussion

4.4.1. Testing the Assumptions of Multiple Linear Regression Model

Regression model was used during the study to test the magnitude to which socio political factor, economic factor, Managerial Factor, timeliness of payment and constriction techniques and design affect cost overrun. The table below presents the results of the regression models. This involves testing multi co-linearity which is used to test independent variables and also testing autocorrelation assumption (Durbin Watson Test).

Table 4. 13 Regression Models

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.887[a]	.786	.719	.15456	.786	11.761	5	16	.000	2.135

a. Predictors: (Constant), CTDF, TPF, EF, MF, SPF

b. Dependent Variable: COR

Source: SPSS result of the own survey 2020

The results from the table 4.13 above designated that a combination socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors had 71.9% (R square= 0.719) predictive likelihood of effect to cost overrun. The predicator variable explains 71.9% of the variation in cost overrun measured by which was attributed to socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors. From the findings, 28.1% of the variance is unexplained. In the outcome, R shows the value of the multiple correlation coefficients between the dependent and the independent variable.Multiple *R* =0.887- R in the above table shows the correlation between dependent variable and independent variables. As given in the table, *R* of 0.887 represents a situation in which the model perfectly predicts the influencing factors of cost overrun.

4.4.2. Test of Autocorrelation Assumption

Table 4.13 illustrates the results of the test of independence of observations. The test was done using Durbin Watson test. Multiple linear regressions assume that the errors are independent

and there is no serial correlation. Errors are residuals or differences between the actual score for a case and the score estimated using the regression equation. Non serial correlation implies that the size of the residual for one case has no impact on the size of the residual for the next case. Durbin Watson statistics is used to test the presence of serial correlation among the residuals. The Durbin Watson value statistics ranges from 0 to 4 as a general rule of thumb, in this case, residuals are not correlated if the Durbin Watson statistics is approximately 2and an acceptable range is 1.5 to 2.50. The result in Table 4.13 shows that, the Durbin Watson statistic is 2.135 which fall within the acceptable range. It implies that there is no serial correlation of errors and therefore, the model was correctly specified.

4.4.3. Multi co-linearity Test on Independent Variables

Before running regression, the test of multi co linearity between independent variables was done. Presence of multico-linearity inflates the variance of the parameter estimates making them individually statistically insignificant even though the overall model may be significant. In addition, multi co linearity causes some errors in estimating the coefficients of independent variables and their interpretation.

The tolerance rate and Variance Inflating Factors (VIF) were used to detect multi- colinearity between explanatory. Table 4.14 indicates that the tolerance is greater than0.1 (10%) and the Variance Inflating Factor (VIF) does not exceed 5 to 10. Up on below results, it was found to be no problem of multi co-linearity among explanatory variables. Therefore, the associated regression coefficients were clearly estimated and reliable.

Table 4. 14 Results of Multi-Co linearity Test on Independent Variables Co efficient [a]

Model		Colinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	SPF	.213	4.699
	EF	.450	2.224
	MF	.286	3.500
	TPF	.512	1.953
	CTDF	.562	1.779

a. Dependent Variable: COR

Source: SPSS result of the own survey 2020

4.4.4. Results of Regression of Independent Variables against Dependent Variable

Cost overrun was determined by socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors. In this case, cost overrun was a dependent variable and socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors were independent variables.

4.4.5. Regression and Correlation Analysis between Factors

Table 4. 15 Correlation Matrix for Cost overrun (COR), Socio Political Factor (SPF), Economic Factor (EF), Managerial Factor (MF), Timelines of Payment and Financial Factor (TPF), Construction Techniques and Design changes (CTDF).

Correlations							
		COR	SPF	EF	MF	TPF	CTDF
Pearson Correlation	COR	1	.837**	.476*	.591**	.500*	.611**
	SPF	.837**	1	.639**	.691**	.375	.654**
	EF	.476*	.639**	1	.260	.335	.438*
	MF	.591**	.691**	.260	1	.619**	.435*
	TPF	.500*	.375	.335	.619**	1	.311
	CTDF	.611**	.654**	.438*	.435*	.311	1
**. Correlation is significant at the 0.01 level (1-tailed).							
*. Correlation is significant at the 0.05 level (1-tailed).							

Source: SPSS result of the own survey 2012

Note: Sig. (1-tailed) *P<0.01, **P<0.10 *N= sample size of 22

The correlation matrix between different factors was shown in the above Table 4.15. By looking at the correlation matrix between the factors it can be understood that Socio political factors was, the most correlated element with cost overrun but it cannot be said cost overrun was highly influenced with this variable. In other words, this matrix does not show the causation of the variables rather showing the magnitude of their association.

The next predicting factor that was also more important was the construction techniques and design factors. This also shows a positive correlation with cost overrun. The correlation

between construction techniques and design factors and cost overrun was .611, which shows that frequent design changes are the major factors for the occurrences of cost overrun.

The next factor, which was more important, was the Managerial factor with a correlation of 0.591, which shows a significant relationship with cost overrun. The finding shows the managerial factor due to delays in decision making process, poor project management leadership style and owners interference in each activity.

The three factors were the most important factors, which show somewhat strong correlation with the cost overrun relatively than the rest two variables. The rest of the factors were also correlated but not as much as the socio political, construction techniques and design changes and managerial factors, Then the researcher analyzes the correlation of each factor with other factors. The perceived quality was most correlated with the satisfaction factor followed by commitment and least correlated with switching cost factor.

The socio political factor was most correlated with the managerial factor (0.691) followed by construction techniques and design change (0.654) and economic factor (0.635) for the occurrences of cost overrun.

In construction techniques and design column, the socio political factor (0.654), economic factor (0.438) and managerial (0.435) factors were more correlated respectively than the others were. The managerial factor was most correlated with socio political factor (0.691) followed by timeline of payment and financial factors (0.619).

4.4.6. Analysis of Variance (ANOVA)

Table 4. 16 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.405	5	.281	11.761	.000[b]
	Residual	.382	16	.024		
	Total	1.787	21			

a. Dependent Variable: COR

b. Predictors: (Constant), CTDF, TPF, EF, MF, SPF

Source: SPSS result of the own survey 2020

Based on the above table 4.16 the P value in the study is less than 5% level of significance as indicated by sign < 000. Therefore, the study models significantly more variance in cost overrun. The study has established variables of socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors that influence to cost overrun on construction project in Wolaita Sodo. Significance of the study means that the regression model was also significant and therefore fit for the study.

4.4.7. The Regression Coefficients of Model

The coefficients of the regression model are illustrated in the table below.

Table 4. 17 The Coefficients of the Regression Model

Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.537	.300		5.118	.000
	SPF	.327	.079	1.040	4.150	.001
	EF	.122	.081	.261	1.512	.150
	MF	.125	.084	.322	1.490	.156
	TPF	.169	.073	.375	2.322	.034
	CTDF	.020	.044	.069	.448	.660

a. Dependent Variable: COR

Source: SPSS result of the own survey 2020

The Regression Equation:

The model was specified as follows:-

COR=β0+β1SPF+β2EF+β3MF+ β4TPF +β5CTDF ε.....

COR= 1.537+0.327SPF+0.122EF+0.125MF + 0.169TPF + 0.020CTDF + 0.300

Whereby COR= cost overrun, β0 was the constant term of the model, β1toβ5 were coefficients of independent variables and ε was the error term. SPF =socio political factor, EF= economic factor, MF= Management factor, TPF= timeliness of payment and financial factor, CTDF= construction techniques and design factors.

The equation above inferred that cost overrun on construction project was influenced by socio political, economic, managerial, timeliness of payment and financial, constriction techniques and design factors.

Based on the above table 4.17, the regression coefficient for socio political is 0.327. This means that the relationship between cost overrun and socio political factors is positive. This implies that socio political factors are the major cases for the occurrences of cost overrun.

The regression coefficient for economic factor is 0.122. This means that the relationship between cost overrun and economic factor is positive. This indicates that the economic factors are influences the costs overrun in construction project.

The regression coefficient for managerial, timeliness of payment and financial, constriction techniques and design factors is 0.125, 0.169, and 0.020 respectively. This indicated that managerial, timeliness of payment and financial, constriction techniques and design factors are positively related with cases for the occurrences of cost overrun in construction project.

- The finding of this study was consistent with the conclusions forwarded by Koushki and Kartam (2004), Aftab,et al.,(2010), Markus and Tanis (2010), Memon et al, (2011), Toh et al, (2012) Abd-Karim et al, (2013) Aftab Hameed (2014), Alaghbari (2014), Shambel Gebrehiwot (2018), Kassaye Tsiga (2018), Yenealem Fentahun (2018) and Teshome Regassa (2019) all the above scholars are studied about factors influencing cost overrun in construction project in different country. They indicated that frequent design changes, change in the scope of the project, cash flow and financial difficulties of owner, delays in decisions making and unforeseen ground condition, shortage of site workers, incorrect planning and scheduling by contractors, inadequate experience of contractors has strong positive relationship with incorrect planning and scheduling, and contractor's poor site management and supervision, changes in scope of project has strong positive relationship with frequent design changes, less materials and equipment supply by contractors, incomplete design, political interference, political pressure at the time of project selection, political instability, client requirements on quality, poor design and delays in design, unrealistic contract duration and requirements imposed lack of experience, late delivery of materials and equipment, relationship between management and labor, fluctuation of prices of materials, shortages of materials, availability of materials and equipment; the availability indirect impact of interest rates, inflation and insolvency, and bankruptcy, drawing

preparation, approval of design, payment delay, slow cash flow, design errors, labor shortage are the most influencing factor for the occurrences of cost overrun in construction project.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

Based on the broad objective the study makes the following conclusion with regard to the specific objectives and research questions that guided the study. It was found that five most significant factors causing cost overrun in public construction project in WolaitaSodo.

- The summary of multi linear regression models in this study is to predict and measure the cases of cost overrun on public construction project. Based on the model the finding revealed that socio political factor, economic factor, managerial factor, timeliness of payment and financial factor and construction techniques and design factor are strongly correlated and significantly related with cost overrun. This implies that all independent variables are factors for the occurrences of cost overrun on public building construction project.

The summery of descriptive statistics in this study were as follows;

- According to the output of this study, socio political factors, economic factors, Managerial factors, construction techniques and design, time lines of payment and financial factors was the major factors related with the occurrences of cost overrun in construction project.
- In related with socio political factors, the survey result depicts that socio political factors are the significant factors for the occurrences of cost overrun, due to political interference. This confirms that political pressure can influence the selection of project. There is usually many more project seeking funding than available resources. In this case powerful politicians may push their pet projects to the front of the line regardless of their economic merits. Under the implementation stage, public procurement may be a source of corruption when political pressure is asserted to influence the selection of bidder. This can lead to collusion and corrupt relationships between the bidder and their backers. Inappropriate funding models can also lead to poor infrastructure outcomes. This confirms that the interference of political pressure can be a major cause that leads to cost overrun. The other significant factors for cost overrun are due to political instability. This confirms that the instability of political situation can be a major cause that leads to cost overrun. On the other hand this study found

that the policy and regulation, structural leadership is not significant factor for the occurrences of cost overrun.

- The result also shows that economic factors are cause for the occurrence of cost overrun, due to economic instability. The study confirms that the change in interest rate and market fluctuation are cause for economic instability this is significant factor for the occurrence of cost overrun. The other economic factors such as exchange rate fluctuation, fluctuation in raw material price are the major factors leads to cost overrun.
- Regarding managerial factors, the finding revealed that Delays in Decision making process, Poor project management Leadership Style and Owners interference are the major factors. This confirms that the delay is one of the leading issues often faced the construction project sites. Delays may result in negative influences such as increased costs, loss of productivity and revenue, claims between the holders and contractor and contract termination are implies delays of manager in decision making process this indicated challenges leads to cost overrun in construction project. poor planning and management of the construction projects may lead to several negative effects on the duration and completion of projects this implies the managerial factors are the hindering factors for the occurrences of cost overrun in public construction projects. However, every construction project needs the freedom to carry out the work without interference, an owners attempt to constrain the project the result is expensive delays and additional costs to the contractor.
- The output related with the construction techniques and design factors are leads to cost overrun, due to Frequent Design change, Design errors and mistakes, incomplete design at time of tender, deficient design and delays in design process and Risk management strategy are significant factor for the occurrences of cost overrun. This confirms that the design change in construction project during post contract period the owner interaction to modify a design change to the scope of the work as defined by the contract document following the creation of legal relations between the principal and the contractor, the changes are not fault of the contractor but the design change may occur in architectural, structural, plumbing and drainage, site works or other aspects of construction are factors for the construction techniques and design change. The design errors and mistakes in the stages of construction project are cause that leads to cost overrun. Poor design and documentation quality are the major causes of construction process inefficiency, leading directly to delays rework and variation and contributing to increasing in project time and cost this implies the deficient design and delays in design process are the major factors that contribute for the occurrences

of cost overrun in construction project. Risk management strategies should be applied to all level of the project to avoid cost overrun, implementing a risk management plan at the beginning of the a project can help to remove some of the possible problems that can appear during project life cycle, so manager should apply risks management skill to avoid any cost problems.

- Regarding time lines of payment and financial factors, the output of this study reviled that Delay in progress payment by owner for work completed, Poor financial control on site, Cash flow difficulties by clients are the major factor for cost overrun.
- Based on the broad objective the study makes the following conclusion with regard to the specific objectives and research questions were as follows;
  - The **correlation result** indicted that socio political factors, economic factors, Managerial factors, construction techniques and design, time lines of payment and financial factors are positively or significantly correlated with cost overrun in construction project.
  - The **descriptive results** show socio political factors, due to political interference, instability of political situation can be a major cause that leads to cost overrun. On the other hand this study found that the policy and regulation, structural leadership is not significant factor for the occurrences of cost overrun.
    - Economic factors, due to change in interest rate and market fluctuation, exchange rate fluctuation, fluctuation in raw material price are the major factors leads to cost overrun.
    - Regarding managerial factors, due to Delays in Decision making process, Poor project management Leadership Style, and Owners interference are the major factors. This confirms that the delay is one of the leading issues often faced the construction project sites.
    - Regarding construction techniques and design factors, due to Frequent Design change, Design errors and mistakes, incomplete design at time of tender, deficient design and delays in design process and Risk management strategy are significant factor for the occurrences of cost overrun.
    - Regarding time lines of payment and financial factors, the output of this study reviled that Delay in progress payment by owner for work completed, Poor financial control on site, Cash flow difficulties by clients are the major factor for cost overrun.

5.2. Recommendation

It is apparent that construction project needs to seriously consider all the internal and external factors causing cost overrun. Based on the analysis of research findings the following recommendations are advocated for further research:

- Therefore, it is recommended that government body should emphasize on the problems of cost overrun by clearly and effectively communicating the construction project and work in progress and the government body should be ensure the political stability and minimize political interference or political pressure during the selection of project and implementation of the project in order to reduce the occurrence of cost overrun.
- The contractor should be aware about the future economic factors in order to minimize the risk related with exchange rate fluctuation and fluctuation in raw material price. Regarding on this problem the contractor should be aware about the current market condition of the construction material, so they are advised to purchase the construction material at the beginning of work.
- In a construction project the management activity should give a good attention to design and implement a process or structure appropriate to the problem and circumstance to clearly organizational goal, manage the external environment, focus on task, clarify line of authority and to give a good decision making in order to solve the problem related with the occurrence of cost overrun.
- With Regarding to construction techniques and design factor this study provides different measure that should be taken so as to minimize occurrence of the unnecessary change of design during construction, these measure are ensure proper feasibility study before design, ensure effective involvement of the parties during design stage, ensure sufficient budget for the project.
- Risk management strategies should be applied to all level of the project to avoid cost overrun, implementing a risk management plan at the beginning of the a project can help to remove some of the possible problems that can appear during project life cycle, so manager should apply risks management skill to avoid any cost problems.
- As it's been stated that in the contract the client should pay a payment to the contractor according to the progress of work, and the payment it should be monthly or according to the contract. The client should pay contractors claims timely to avoid any cost overrun in construction projects.

- Finally this study recommended that in public construction project the concerned body should be provide a good planning and scheduling are continuing process during construction and match with the resources and time to develop the work to avoid cost overrun. The government body should revise the bid document such as technical specification during bill of quantities and the design of the project in a good way. However, the concerned body should facilitate payment to contractors in order to overcome delay in progress payment and avoid the occurrences of cost overrun.

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7. Appendix

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

CAUSES OF COST OVERRUN ON PUBLIC BUILDING CONSTRUCTION PROJECTS: A CASE STUDY IN WOLAITA SODDO TOWN

Questionnaire

Section One – Background Information

This part of the questionnaire covers items related to background of the respondents.

(Please put ✓in the appropriate boxes)

1. Location

Wolitasodo ☐ Other, please specify……

2. Please indicate your organization type:

Owner ☐ Designer/ Architect ☐

Contractors ☐ Subcontractor ☐

Consultants ☐ Supplier ☐

Other, please specify …….

3. Please indicate your job designation

Owner ☐ Project Engineer ☐

Resident Engineer ☐ Site superintendent ☐

Project / Construction manager ☐

Other, please specify …….

4. Please indicate your Industry type

Superstructure ☐ Industrial ☐

Infrastructure ☐

Other, please specify …….

5. What is the Size of your company

Large (>250 employees) ☐ Small (10 < employees < 50) ☐

Medium (50 < employees < 250) ☐ Micro (< 10 employees ☐

6. How many years have you been working in construction projects?

Less than 5 years ☐

6 to 10 years ☐

11 to 15 years ☐

Over 16 years ☐

Section Two

Question Related with Factors that Affecting Cost Overrun in Construction Project

1. Please rank the factors that cause occurrence of cost overrun in construction project

   N.B Rank the factors in order of their importance in contributing to the occurrence of cost overrun in construction project from 1-7 (rank from 1-2= highest, from 3-5=medium and from 6-7= lowest)

Factors for the occurrence of cost overrun	Rank 1=highest…..7 =lowest
Socio political factors	
Economic factors	
Managerial factors	
Timeliness of payment	

All of this can be done using on a lacerate scale of 1 - 5 as shown in the below table:

Question Title

lacerate Scale	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5

2. Please indicate your degree of agreement or disagreement to the statements affecting the socio political factors for the occurrence of cost overrun

Factors		Choose				
		Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree(5)
2.1	Policy and regulations	1	2	3	4	5
2.2	Structural leadership	1	2	3	4	5
2.3	Political interference	1	2	3	4	5
2.4	Political instability	1	2	3	4	5

3. Please indicate your degree of agreement or disagreement to the statements affecting the Economic factors for the occurrence of cost overrun in construction project.

	Factors	Chose				
		Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree(5)
3.1	Economic instability	1	2	3	4	5
3.2	Exchange rate fluctuation	1	2	3	4	5
3.3	Fluctuation in raw material price	1	2	3	4	5
3.4	Financial difficulties of owner	1	2	3	4	5

4. Please indicate your degree of agreement or disagreement to the statements affecting to managerial factors for the occurrence of cost overrun in construction project.

Factors		Choose				
		Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree(5)
4.1	Delays in Decision making process	1	2	3	4	5
4.2	Poorprojectmanagement Leadership Style	1	2	3	4	5
4.3	Poor Design assumptions(planning)	1	2	3	4	5
4.4	Owners interference	1	2	3	4	5

5. Please indicate your degree of agreement or disagreement to the statements affecting to construction techniques and Design change are Factors for the occurrence of cost overrun in construction project.

Factors		Choose				
		Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree(5)
5.1	Frequent Design changes	1	2	3	4	5
5.2	Design errors and mistakes	1	2	3	4	5
5.3	Incomplete design at time of tender	1	2	3	4	5
5.4	Deficient design and delays in design process	1	2	3	4	5
5.5	Risk management strategy	1	2	3	4	5

6. Please indicate your degree of agreement or disagreement to the statements affecting to time lines of payment (financial factor)that causes for the occurrence of cost overrun in construction project

Factors		Choose				
		Strongly disagree(1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree(5)
6.1	Delay in progress payment by owner for work completed	1	2	3	4	5
6.2	Cash flow difficulties by clients	1	2	3	4	5
6.3	Poor financial control on site	1	2	3	4	5
6.4	Financing and payments of completed project	1	2	3	4	5

7.2. Appendix 2 Reliability Study Statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.881	.880	24