FACTORS AFFECTING CONSTRUCTION PROJECTS PERFORMANCE IN JIMM UNIVERSITY, ETHIOPIA.

BY:

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A THESIS SUBMITTED TO JIMMA UNIVERSITY, COLLEGE OF BUSINES AND ECONOMICS DEPARETEMENT OF ACCONITENIC AND FINANCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER'S OF ARTS IN PROJECT MANAGEMENT AND FINANCE.

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JIMMA UNIVERSITY
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JUNE, 2021

DECLARATION

I, the undersigned, hereby declare that the research Report entitled "F**actors Affecting construction projects Performance in Jimma University**" submitted to Research and Postgraduate Studies' Office of Business and Economics College is an original work and all the materials referred in the process have been duly acknowledged.

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CERTIFICATE

We certify that the Research Report entitled "F**actors Affecting construction projects Performance in Jimma University** "was done by Mr. Gosa Kene in partial fulfillment of the award of Master of Arts Degree (MA) in Project Management and Finance, is original work and all the materials referred in the process have been duly acknowledged.

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Abstract

It is apparent that the construction industry is a very important part of any country's growth and it highly contributes to the growth and development of the economy in developing countries. Construction projects suffer from several problems and difficult matters in performance such as cost, time and quality. Jimma University construction projects were similar to that. This thesis tries to identify the main factors affecting the performance of construction projects in the institutions. A questionnaire survey was conducted which are classified in to 7 clusters, 90 Questionnaires were disseminated, and 78 questionnaires were returned: 13 (86.7%) from owners and 65 (86.6%) from contractors. The results were analyzed using relative importance index and multiple linear regression analysis to determine owners and contractors' awareness toward the performance influencing factors in construction projects and to see independent variables effect on dependent variable (construction project performance). The study found that independent variables showed significant relation with the dependent variable and the independent variables describe 41.3% of variance of the dependent variable performance of construction projects in Jimma University. The contractor related factors and labor and material related factors are the most influential that delay the project success in the jimma university construction project performance with average of Relative Importance Index (RII) equals 0.723 and 0.722 respectively. Project characteristics relate factors are the least influential factors in the jimma university construction project performance with average of Relative Importance Index (RII) equals 0.582. Contractors should have enhanced further for skilled workers who are accessible in all sides at both office and position that will solve associated problems on appropriate construction management, quality of work, cost control and time management. There should be government and projects owners who are selecting a competent contractor for a job that is serious for the successful delivery of a construction project and to solve the problems of the escalation of material prices and improper quality of materials in construction projects.

***Keywords**: Jimma University, Construction projects, Contractors, Owners, and Performance Multiple Regression Analysis.*

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ACRONYMS

ANOVA……..Analysis of variance

CSFs ……Critical Success Factors

G.C……... Gregorian calendar

MoWUD……..Ministry of Works and Urban Development

RII……Relative Importance Index

SPSS……Statistical Package for the Social Science

VIF……..Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

It is obvious that construction industry is a very essential part of any country's growth. It highly contributes to the growth and development of the economy in developing countries. In current development, witnessed globally, it is observed that the construction industry has become one of the largest industries and its contribution is more than 10% of global economy. (Savita et al., 2014) this shows us the industry is most influential, important and if not handed in the right way it can affect the economy of one country. Public construction projects are parts of the country's development initiative; they share substantial amount of the country's threatened financial resources. (Neway S. (2018). In Ethiopia, the construction industry is the highest beneficiary of government budget in terms of government development programs. Subsequently, public construction projects consume an average annual rate of almost 60% of the government's capital budget (MoWUD, 2006). This shows us more than half of government budget is consumed by construction projects and those projects objective are success.

Project success is almost the eventual goal for every project. However, it means different things to different people. While some writers consider time, cost and quality as predominant criteria, others suggest that success is something more complex.(Chan, et al., 2004). The study of project success is often considered as one of the vital ways to improve the effectiveness of project delivery (Chan et al., 2004). In the construction industry, the aim of project control is to ensure that projects finish on time, within budget and achieve other project objectives. It is a complex task undertaken by project managers in practice, which involves constantly measuring progress, evaluating plans and taking corrective actions when required (Kerzner, 2003). The concept of success in a construction project can be evaluated only when the evaluation dimensions are adequately defined.

One of the reasons of the difficulties in managing a construction project, especially in the government sector is due to the failure in determining the Critical Success Factors across project phases (Takim et al., 2004). Numerous studies have been conducted over the years to investigate

factors that are really critical towards project success, (Chan et al., 2004; Anderson et al., 2006; (Toor and Ogunlana, 2009; Iona et al. 2015; Nipin J.B 2015; Yada & Yadeta 2016). Thus; highlighting the importance of critical success factors (CSFs) study towards construction project success. However, no general agreement can be made (Chan et al., 2004).

Completing projects on time is an indicator of efficiency, but the construction process is subject to many variables and unpredictable factors, which result from many sources. These sources include the cost related, time related and quality related factors. However, it is rarely happen that a project is completed within the specified time.

Different researchers have tried to determine the factors for a successful project for a long time. Lists of variables have been abounded in the literature; however, the concept of project success remained vaguely defined as there is no general agreement accomplished. It is commonly accepted that the major goals of all parties involved in construction projects–owners, contractors, engineers and consultants in either the public or private sector is to successfully complete the project on schedule, within planned budget, with the highest quality and in the safest method (Chan et al., 2004; Mohammed M. Alkhathami, 2004; Rohaniyati Salleh, 2009).

Therefore, to ensure that public building construction projects run smoothly without any delay and cost overrun; understanding of the problems encountered during the construction process should be conducted more thoroughly. The factors that cause delays and cost overrun in the public building construction projects should be well addressed and mitigated so that the projects can be completed within the stipulated time. The current research investigated those particular factors relating to cost, time & quality. Construction performance embraces client's satisfaction, time performance, cost performance, construction quality and sustainable development.

Jimma University is one of the target areas where public building expansion programme has been implemented. However, public building construction industry has complexity in its nature because it involves large number of parties as clients, contractors, consultants, stakeholders, regulators and others. The study identified the factors and attributes affecting performance of building construction projects and formulates recommendations to the success of projects in Jimma University.

1.2. Statement of the Problem

As stated by A. Yohannes (2017), construction projects in Ethiopia are usually completed within a period longer than what is agreed upon by the contracting parties and with greater cost growth from the contract amount. As a result most of the construction projects don't succeed with their schedule and budget, this occurs variation occurs because of some factors; for this reason the achievement of one's aim will decrease.

Construction delays are happening in every phase of a construction project and are common problems in construction projects in Ethiopia. One study shows that in Ethiopia only 8.25% projects have been finished to the original targeted completion date. The remaining 91.75% delayed 352% of its contractual time (Werku et al 2016), for this reason the current study is anticipated to find those factors that contribute for delay which make the project not to succeed in its estimated schedule. Success factors determine the positive outcomes of implementing projects. They have to be identified before projects' implementation, from the conception phase. But projects environments are dynamic, so success factors might change their level of influence in time. Thus, a permanent monitoring of these factors is needed and whenever necessary the project manager should influence certain factors in order to increase probabilities of accomplishing success criteria. (Ioana et.al. 2015).

Ethiopia as a country has witnessed a substantial increase in the number of delayed projects due to in appropriate project organization structures and ineffective leadership. There is evidence that the performance of the building construction in Oromia, Ethiopia is poor as time, cost and quality performance of projects are to the extent that over 70% of the projects initiated are likely to escalate with time with a magnitude of over 50% and over 50% of the projects likely to escalate in cost with a magnitude of over 20% (OIUD, 2007). Therefore the current study dug the factors that contribute for cost overrun.

As indicated by Sambasivan and Soon (2006) cite Assaf and Al-Hejji (2006) as saying that in Saudi Arabia only 30% of construction projects are completed within the scheduled completion dates and that the average overrun was between 10% and 30%. In a similar vein, an examination of the records of more than four thousand construction projects by Morris et al, (1998), showed that projects were rarely finished on time or within the allocated budget. In public building construction project the same is true that construction projects suffer mainly time overrun and

also cost & quality performance issues. A similar conclusion was arrived at by Chan and Kumaraswamy (1997) in a study carried out in Hong Kong concluding that timely delivery of projects within budget and to the level of quality standard specified by the client is an index of successful project delivery. This seems to be a conclusion of many studies. They further observe that failure to achieve targeted time, budgeted cost and specified quality result in various unexpected negative effects on the projects. It is further observed that normally when the projects are delayed, they are either extended or accelerated and therefore incur additional cost.

Kibuchi and Muchungu, (2012) discovered that despite the high quality of training of consultants in the building industry and regulation of the industry in major urban areas, construction projects do not always meet their goals. This is manifested by myriad projects that have cost overrun, delayed completion period and poor quality resulting to collapsed buildings in various parts of the country, high conservation costs, displeased clients and even buildings which are not functional. Also Previous studies: (Nyangilo, 2012; Lepartobiko, 2012; Mhando & Mrema, 2005), indicate that the failure of any project is mainly related to the problems and failure in performance. Developing countries have higher rate of low project performance than developed countries, Lepartobiko (2012). For this reason the current research will investigate factors that affect the performance of construction project so that rate of project success increase in developed countries (Specifically Jimma University) and the future construction projects will prepare beforehand, which help them to complete without failure and delay.

As we can get from other previous studies (Ugwu and Haupt, 2007; Navon, 2005; Iyer and Jha, 2005; Cheung, 2004; Kuprenas, 2003; Samson and Lema, 2002; Lehtonen, 2001) that the failure of any project is mainly related to the problems and failure in performance. Moreover, there are many reasons and factors which attribute to this problem. Most of these studies mainly focus on one aspect of performance issues mainly Cost and Time instead of their overall factors that affect the success of the project in terms of time, cost & quality, which make the current research differ from those because it consider the effect of quality in construction project.

Fetene (2008) studied the causes and effects of cost overrun on public building construction project in Ethiopia, Siraw (2014) studied the analysis of factors contributing to time overruns on building construction projects under Addis Ababa city Administration, Tekalign (2014) studied the role of project planning on project performance in Ethiopia. From these studies that have

been done on cost overruns on construction projects, there is a need for future studies to focus on the following areas: The effects of construction project manager's skills on projects performance and find out between public and private construction projects, which one has got higher performance level. It is also recommended to develop performance measurement framework and modeling system in order to measure performance of construction organizations and projects. The gap of the pervious study was not seen the project procurement systems, but included it in this study and even though different construction projects are performed in Jimma University, no studies are conducted particularly about construction projects performance.

1.3. Research Questions

This section encompasses questions that the researcher wants to ask to shape the study.

1. How does a project characteristics related factor affect performance of construction project at Jimma University?

2. How does labor and material related factors affect performance of construction projects in Jimma University?

3. How does a contractual related factor affect performance of construction projects in Jimma University?

4. How does project procurement's factor affect performance of construction projects in Jimma University?

5. How does clients' related factor affect performance of construction projects in Jimma University?

6. How does contractors' related factor affect performance of construction projects in Jimma University?

7. How does environmental related factor affect performance of construction projects in Jimma University?

1.4. Research objective

1.4.1 General Objective

The aim of this research is to analyze the Internal and external factors affecting the performance of construction projects in Jimma University, Ethiopia.

1.4.2 Specific Objectives

1. To examine the effect of project characteristics related factors on performance of construction project in Jimma University.

2. To examine the effect of labor and material related factors on performance of construction project in Jimma University.

3. To examine the effect of contractual related factors on performance of construction project in Jimma University.

4. To examine the effect of project procurements related factors on performance of construction project in Jimma University.

5. To examine the effect of clients' related factors on performance of construction project in Jimma University.

6. To examine the effect of contractors' related on performance of construction project in Jimma University.

7. To examine the effect of environmental related on performance of construction project in Jimma University.

1.5 Significance of the Study

Critically thinking of construction projects performance for ensuring growth and development of a given nation and looking at the resource constraints, ranging from human resource to financial constraints, poor capacity of contractors, week implementation capacity of the implementer and others, it necessary to investigate factors that are important for a construction projects performance and identify the most influential ones that are determining the effective implementation. Therefore, the significance of this study is to highlight the main performance factors that the project team must pay closer attention to in order that the projects can be

completed within budget and schedule, to standard level of quality, and to the pleasure of end users. Secondly the results and recommendations from this study will help as reliable information to government and project stakeholders in the formulation and implementation policies to improve the construction projects performance.

1.6. Scope of the research

This study was focused on the factors affecting construction project performance and identifying factors that affect their performance. The major motivation for this study is the absence of any study conducted on the factors affecting construction project performance in Jimma University. The study was focused on projects started between 2017– 2020 G.C because for the sake of getting appropriate data most of the project time setting was 4-5 years.

1.7. Limitation of the study

This study contains few limitations the responses gathered from project stakeholders were based on their awareness so conceivable bias that might have been created when respondents replied some of the questions. Some challenges were met during the research period and due to the construction project dynamic nature, shortage time of the respondents; rare respondents were refused but to communicate with the project managers to solve the problems.

1.8. Organization of the Research

This study is organized into five chapters. The first chapter is the introductory part of the study which consists of background of the research, statement of the problem, research question, objectives, significance and scope of the study. The second chapter deals with related review of literature relevant to this study. The third chapter discusses the research method and the data collection from the subject of the study about method of analyzed and the fourth chapter result and discussion. Lastly, chapter five presents conclusion and recommendations including reference and appendix

CHAPTER TWO

Literature Review

2.1. Theoretical review

2.1.1 The Theory of Performance

The Theory of Performance develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements (Don, 2010). To perform is to produce valued results. A performer can be a single or a group of people engaging in a collaborative effort. Developing performance is a journey, and level of performance defines location in the journey. Recent level of performance depends holistically on 6 components: context, level of knowledge, levels of skills, level of identity, personal factors, and fixed factors. Three maxims are planned for effective performance improvements. These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice. Performance advancing through levels where the labels Level 1, Level 2, etc. are used to characterize effectiveness of performance. That is, a person or organization at Level 3 is performing better than a person or organization at Level 2. Performing at a higher level produces results that can be classified into categories: (i) quality increases results or products are more effective in meeting or exceeding the expectations of stakeholders, amount of waste goes down, (ii) capability increases, ability to tackle more challenging performances or projects increases, (iii) capacity increases ability to generate more throughput increases, (iv) knowledge increases, depth and breadth of knowledge increases, (v) skills increase abilities to set goals persist, maintain a positive outlook, etc. increase in breadth of application and in effectiveness and (vi) identity and motivation increases individuals develop more sense of who they are as professionals, organizations develop their essences.

2.1.2 Construction Projects and Performance

Project success is almost the ultimate goal for every project. Success of construction projects depends mainly on success of performance. Many previous researches had been studied on performance of construction projects. Dissanayaka and Kumaraswamy (1999) remarked that one of the principle reasons for the construction industry's poor performance has been attributed to the inappropriateness of the chosen procurement system. Thomas (2002) identified the main

performance criteria of construction projects as financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting. Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization.

2.1.3 Construction project performance measurement models

Two models developed for measuring construction project performance are integrated performance index (Pillai et al., 2002) and key performance indicator (Construction Industry Task Force, 1998). Integrated Performance Index was developed initially for performance measurement of R&D projects, based on their real-life experiences of working on the management system for the integrated guided missile development programmer of India. The model identified three project phases and dealt with performance elements such as performance indicators or key factors associated with each phase; the stakeholders; and the performance measurements. The three project phases identified are the project selection phase, the project execution phase and the implementation phase. The usefulness of the integrated performance index is that it can be applied at all the phases of the project life cycle to rank the project for selection, to compare project performance under the execution phase and to act as an input for the management of future projects. One problem of the model is lack of clarity in the way the mathematical formulae is used to integrate the identified key factors into an integrated performance index. Given this shortcoming, this model is not well received by practitioners. Key Performance Indicators (KPIs) is the UK construction industry's response to Egan’s report (Construction Industry Task Force, 1998) to measure project performances, based on 10 identified parameters. These consist of seven project performance indicators; construction cost, construction time, cost predictability (design and construction), time predictability (design and construction), defects, client satisfaction with the product and client satisfaction with the service; and three company performance indicators namely; safety, profitability and productivity. The strength of this model is that the overall concepts are easily understood and easily implemented by clients, designers, consultants, contractors, sub-contractors and suppliers. One problem with the model is that the KPIs are not compartmentalized along project phases.

2.1.4 Performance Measurement Theory

Mbugua et al., (1999) have identified a distinction between performance indicators, performance measures and performance measurement. According to Mbugua et al., performance indicators specify the measurable evidence necessary to prove that a planned effort has achieved the desired result. In other words, when indicators can be measured with some degree of precision and without ambiguity, they are called measures. However, when it is not possible to obtain a precise measurement, it is usual to refer to performance indicators. Performance measures are the numerical or quantitative indicators (Sinclair and Zairi, (1995). On the other hand, performance measurement is a systematic way of evaluating the inputs and outputs in manufacturing operations or construction activity and acts as a tool for continuous improvements (Sinclair and Zairi, 1995; Mbugua et al., 1999). In response to calls for continuous improvement in performance, many performance measurements have emerged in management literature. Some examples include: the financial measures (Kangari et al., 1992), client satisfaction measures (Walker, 1984), employee measures (Abdel-Razek, 1997), project performance measures (Belassi et al., 1996) and industry measures (Egan, 1998). Rene cordero (1990) classifies performance measurement based on the method of measurement and area of measurement. The methods of measurement of performance can be in terms of the technical performance, the commercial performance and the overall performance. The areas of measurement are at the planning & design level, the marketing level and manufacturing level etc., and for the overall performance are at the level of a firm or strategic business unit.

2.1.5 Measurement of Project Performance

The purpose of performance measurement is to help organizations understand how decision-making processes or practices led to success or failure in the past and how that understanding can lead to future improvements. Tangen (2004) obtained that performance measurement is a complex issue that normally incorporates at least three different disciplines: economics, management and accounting. Measurement of performance has garnered significant interest recently among both academics and practitioners. Lehtonen (2001) stated that performance measurement systems are imminent in the construction firms. Karim and Marosszeky (1999) stated that performance measurement systems have been one of the primary tools used by the manufacturing sector for business process re-engineering in order to monitor the outcomes and effectiveness of implementation. Navon (2005) defined performance measurement as a

comparison between the desired and the actual performances. He also stated that performance measurement is needed not only to control current projects but also to update the historic database. Such updates enable better planning of future projects in terms of costs, schedules, labor allocation, etc. Karim and Marosszeky (1999) defined the purpose of key performance indicators as to enable a comparison between different projects and enterprises to identify the existence of particular patterns. They used different representation values to evaluate time and cost performance such as project characteristics, procurement system, project team performance, client representation's characteristics, contractor characteristics, design team characteristics, external condition. Samson and Lema (2002) remarked that characteristics of emerging performance measurement indicators need analysis of both the organization and environment such as: nature of work, global competition, quality awards, organizational role, external demands and power of IT. The indicators should be able to identify causes of problems, address all possible performance drivers, and identify potential opportunities for improvement. Cheung et al (2004) remarked seven main key indicators for performance which are: time, cost, quality, client satisfaction, client changes, business performance, and safety and health.

2.1.6 Problem of Performance in Construction Industry

The failure of any construction project is mainly related to the problems and failure in performance. Moreover, there are many reasons and factors which attribute to such problem. Long et al, (2004) stated that the construction industry performance problems in developing economies can be classified in three layers: problems of shortages or inadequacies in industry infrastructure (mainly supply of resources), problems caused by clients and consultants, and problems caused by contractor incompetence/inadequacies. Okuwoga (1998) identified that the performance problem is related to poor budgetary and time control. Long et al (2004) remarked that performance problems arise in large construction projects due to many reasons such as: incompetent designers/contractors, poor estimation and change management, social and technological issues, site related issues and improper techniques and tools. Navon (2005) stated that the main performance problem can be divided into two groups: (a) unrealistic target setting (i.e., planning) or (b) causes originating from the actual construction (in many cases, the causes for deviation originate from sources).

2.1.7 Factors Affecting Cost and Time Performance

Pheng and Chuan (2006) stated that there have been many past studies on project performance according to cost and time factors.

Chan and Kumaraswamy (2002) remarked that studies in various countries appear to have contributed significantly to the body of knowledge relating to time performance in construction projects over the past three decades, while Iyer and Jha (2005) remarked that project performance in term of cost is studied since 1960s. Chan and Kumaraswamy (1996) stated that a number of unexpected problems and changes from original design arise during the construction phase are leading to problems in cost and time performance. They found that poor site management, unforeseen ground conditions and low speed of decision making involving all project teams are the three most significant factors causing delays and problems of time performance in local building works. Okuwoga (1998) stated that cost and time performance has been identified as general problems in the construction industry worldwide. Dissanayaka and Kumaraswamy (1999) remarked that project complexity, client type, experience of team and communication are highly correlated with the time performance; whilst project complexity, client characteristics and contractor characteristics are highly correlated with the cost performance.

Iyer and Jha (2005) remarked that the factors affecting cost performance are: project manager's competence; top management support; project manager's coordinating and leadership skill; monitoring and feedback by the participants; decision making; coordination among project participants; owners' competence; social condition, economical condition and climatic condition. Coordination among project participants was identified as the most significant of all the factors having maximum influence on cost performance of projects. Chan and Kumaraswamy (2002) proposed specific technological and managerial strategies to increase speed of construction and so to upgrade the construction time performance. It is remarked that effective communication, fast information transfer between project participants, the better selection and training of managers, and detailed construction programs with advanced available software can help to accelerate the performance.

2.1.8 Factors Affecting Quality Performance

Arditi & Gunaydin (1998) find that management commitment to continuous quality improvement, management leadership in promoting high process quality; quality training of all personnel, efficient teamwork to promote quality issues at the corporate level; and effective cooperation between parties taking part in the project are generic factors that affect process of quality. Pheng and Chuan (2006), through case studies, has shown that total quality management a successful management philosophy in the manufacturing and service industry could be replicated in the construction industry with similar benefits. The benefits may be in terms of reduction in quality costs, and better employee job satisfaction. Iyer and Jha (2005) observe that a contractor's quality assurance system, which ensures consistent quality, is essential in preventing problems and the reoccurrence of problems. His survey also points to the lack of documentation of a quality system for the majority of the contractors.

2.1.9 Operational Definition of Variables

Key performance indicator (KPI): is a type of performance measurement which evaluates the success of an organization or of a particular activity in which it engages.

Time overruns: is defined as the extension of time beyond planned completion dates.

Cost overruns: is the difference between the original cost estimate of project and actual construction cost on completion of works.

Project: Construction projects constructed between 2017 - 2020 G.C.

Construction: Construction of any building and Road construction projects undertaken by Jimma University office.

Owner: Organization for whom the construction project is being undertakes.

Contractor: A natural or juridical person under contract with an owner to construct the construction projects.

Performance: The accomplishment of a given construction projects against the contractual cost, time and quality standards.

2.2. Empirical Review

Enshassi et al. (2009) in his thesis on factors affecting the performance of construction projects in the Gaza Strip, found out that the most important factors agreed by the owners, consultants and contractors were: average delay because of closure and materials shortage, availability of resources as planned through project duration, leadership skills for project manager, escalation of material prices, availability of personals with high experience and qualification and quality of equipment and raw materials in project. Bui et al., (2010) in their study carried out in Vietnam on factors affecting construction project outcomes discovered that major enablers that lead to project success are foreign experts' involvement in the project, government officials inspecting the project and very close supervision when new construction techniques are employed. Amusan and Adebile, (2011) studied factors affecting construction cost performance in Nigerian construction sites. He discovered from the analysis that factors such as contractor's inexperience, inadequate planning, inflation, incessant variation order, and change in project design were critical to causing cost overrun, while project complexity, shortening of project period and fraudulent practices are also responsible.

Iyagba, Odusami and Omirin, (2003) did a research on the relationship between project leadership, team composition and construction project performance in Nigeria. The tests of the hypotheses led to the conclusion that there was significant relationship between the project leader's professional qualification, his leadership style, team composition and overall project performance. No significant relationship was found between the project leader's profession and overall project performance. Iyer and Jha (2005) did a research on factors affecting cost performance evidence from Indian construction projects and found out that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Nyangilo, (2012) did an assessment of the organization structure and leadership effects on construction projects' performance in Kenya, he found out that lack of appropriate project organization structures, poor management systems and leadership are the major causes of poor project performance.

Chan and Kumaraswamy (2002) remarked that project performance measurement includes time, budget, safety, quality and overall client satisfaction. Kuprenas (2003) stated that project performance measurement means an improvement of cost, schedule, and quality in design and

construction stages. Navon (2005) defined performance measurement as a comparison between the desired and the actual performances. The construction industry performance is affected by national economies (Navon, 2005). Despite this complexity, the construction industry plays a major role in the development and achievement of goals in the society. The pace of the economic growth of any nation can be measured by the development of the physical infrastructure such as buildings, roads and bridges (Takin and Akintoye, 2004). Successful building construction projects are those projects finished on time, within budget, in accordance with specifications and to stakeholders' satisfaction (Chua et al., 1999, Puspassari, 2005, Ogunsemi, 2006; Yaman, 2007). Studies were conducted to examine factors impacting on project performance in developing countries. Shortage of skills of manpower, poor supervision, poor site management, unsuitable leadership, shortage and breakdown of equipment among others contribute to construction delays in the United Arab Emirates (Faridi and El-Sayegh,

2006). According to Ajayi et al. (2010) the choice of contractor(s) is a critical factor for the project manager and usually has a significant impact on the success or failure of a project. The performance of a contractor will definitely correlate with the performance of the contract. He further observed that the evaluation of performance has been a challenge for the construction industry for decades. Several models and methods have been proposed by researchers for the evaluation of project performance. However most of these procedures according to Ajayi et al. (2010) limit their analysis to selected measures such as cost, schedule or labor productivity. Construction performance embraces client's satisfaction, time performance, cost performance, construction quality and sustainable development. Mbachu and Nkando (2007) established that quality and attitude to service is one of the key factors constraining successful project delivery in South Africa. Ling et al (2007) remarked that architectural, engineering and construction (AEC) firms may face difficulties managing construction projects performance in China because they are unfamiliar with this new operating environment. Kim et al (2008) stated that international construction projects performance is affected by more complex and dynamic factors than domestic projects; frequently being exposed to serious external uncertainties such as political, economic, social, and cultural risks, as well as internal risks from within the project. Puspassari (2005) identified 46 possible factors responsible for poor performance of construction contract. He further categorized these factors into eight groups as factors caused by clients, factors caused by contractors, factors caused by consultants, factors related to subcontractors, factors related to

material and labor, contractual relationship factors, project procedures and external environment factors.

Fetene, (2008) did a study on causes and effects of cost overrun on public building construction projects in Ethiopia. From the results it was found that 67 out of 70 public building construction projects suffered cost overrun. The rate of cost overrun ranges from a minimum of 0% to the maximum of 126% of the contract amount for individual projects. Tekalign (2014) studied the role of project planning on project performance in Ethiopia. From these studies that have been done on cost overruns on construction projects, there is a need for future studies to focus on the following areas: The effects of construction project manager's skills on projects performance. Find out between public and private construction projects, which one has got higher performance level. It is also recommended to develop performance measurement framework and modeling system in order to measure performance of construction organizations and projects. In addition, it is recommended to study and evaluate the most important factors affecting the performance of construction projects.

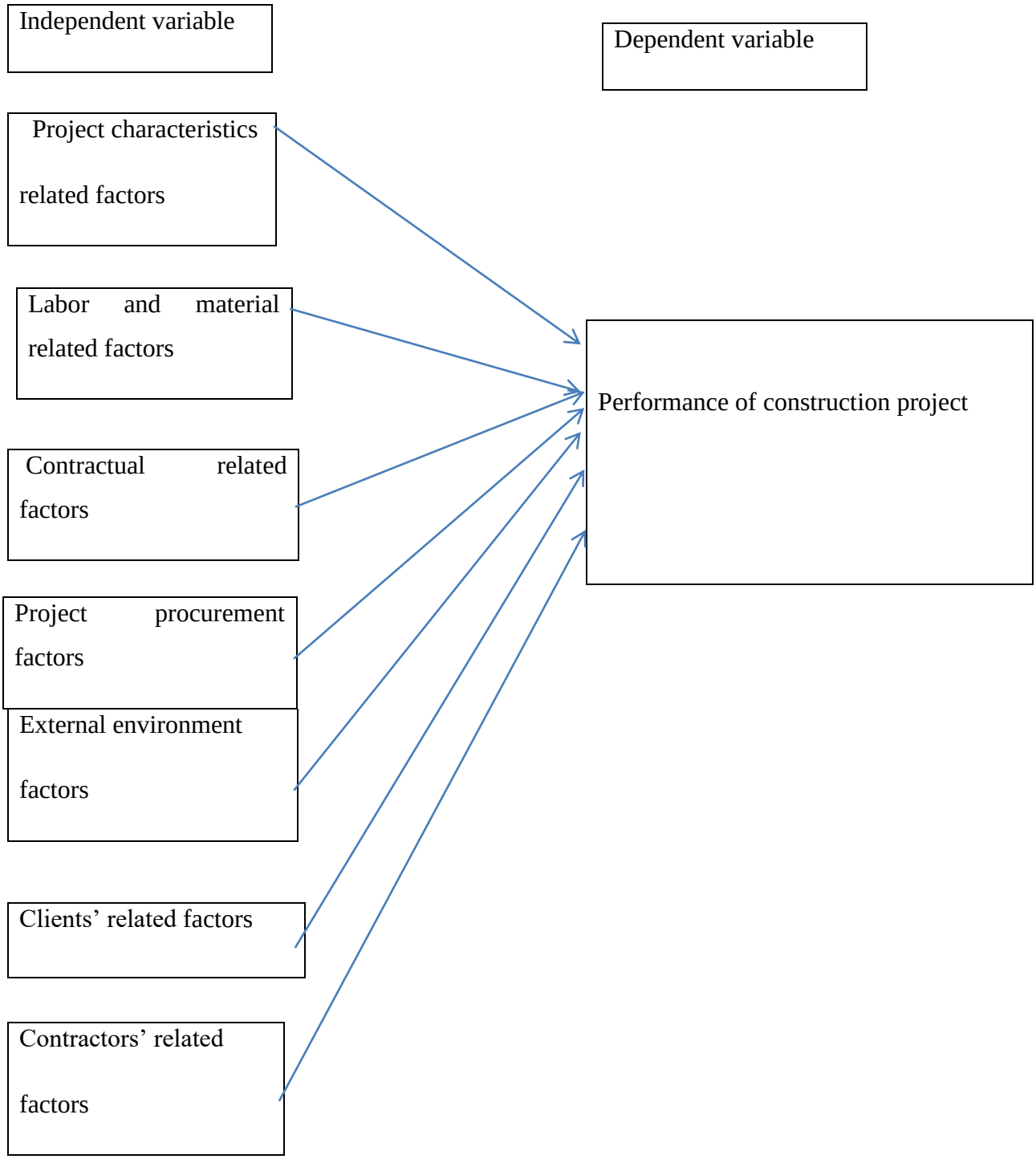
According to previous studies, it could be said that the performance measurement is a process that include factors as Key Performance Indicators (KPIs) such as time, cost, quality, client satisfaction; leadership style and safety in order to enable measurement of current construction projects performance and to achieve significant performance improvements of future projects. It will be obtained that there were many fields and topics which are related to performance such as, construction management, information technology, factors affecting performance of managers, measurement of project performance, key performance indicator and benchmarking. The key performance indicators are used to evaluate performance of construction projects. These indicators will be used for benchmarking purposes, and will be as a key component of any organization to move towards achieving best practice and to overcome performance problem in Jimma University construction projects.

2.3. Synthesis of the review

In citation of previous studies, little attention is being paid to construction performance in Ethiopia and generally on non-governmental organization implemented projects. Based on a literature review of the existing factors affecting performance of construction projects, they can be grouped as project characteristics related factors, labor and material related factors,

contractual relationship, project procedures, external environment, clients' related factors and contractors' related factors. These categories form the basis by which research model developed to measure their effect on construction performance of this study.

It is graphically presented as shown below (Figure 1).



Source: (Puspassari, 2005)

Figure1: Conceptual framework for factors affecting construction projects performance.

2.4. Research Hypothesis

The following hypotheses are developed and had been tested using Analysis of Variance statistical tool.

Ha1: Project characteristics related factors significantly affect construction projects performance.

HO1: Project characteristics related factor does not significantly affect construction projects performance.

Ha2: Project labor and material related factors significantly affect construction projects performance.

HO2: Project labor and material related factors does not significantly affect construction projects performance.

Ha3: Project contractual related factors significantly affect construction projects performance.

HO3: Project contractual related factor does not significantly affect construction projects performance.

Ha4: project procedures related factors significantly affect construction projects performance.

HO4: project procedures related factor does not significantly affect construction projects performance.

Ha5: Project external environment related factors significantly affect construction projects performance.

HO5: Project external environment related factor does not significantly affect construction projects performance.

Ha6: Project clients' related factors significantly affect construction projects performance.

HO6: Project clients' related factor does not significantly affect construction projects performance.

Ha7: Project contractors' related factors significantly affect construction projects performance.

HO7: Project contractors' related factor does not significantly affect construction projects performance.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Study area and study period

The study was conducted in Jimma University. Jimma University is found in Jimma town which is located in Oromia region, South West of Ethiopia at about 352 KMs from Addis Ababa, capital city of Ethiopia. Jimma University was established in 1983 and currently has 2 institutes, 7 colleges and over 40 departments teaching more than 45,000 students on regular, summer and continuing and distance education programs. It is the pioneer university in community based education in the Ethiopian history. The study was conducted from March 21-30, 2021.

3.2. Research Design

According to Kerlinger (1986) research design is the plan and structure of investigation perceived so as to obtain answers to research questions or test the research hypothesis. The plan represents the overall strategy used in collecting and analyzing data in order to test research hypothesis. In this study, descriptive and explanatory research designs were used. The main purpose of descriptive research is description of the national of matters as it survives at present. Then this study describes and critically assesses the factor affecting the performance of construction projects in Jimma University. Organizational- based cross- sectional study with quantitative technique was conducted.

3.3 Target population

The study covered of the stakeholders involved in construction projects; as owners Jimma University Construction management office engineers & related program managers) and contractors who was involved in construction projects during study time considered. For this study, projects started from 2017-2020 G.C were taken based on data availability in the construction management unit and on getting contractors involved. There were a total of 15 individuals administering construction projects on the owner side and 75 from the contractor side. Census survey was used for target populations to study subjects. The questionnaire was distributed to engineers & other professionals who knew the concerned construction projects during the specified time.

3.4 Data Source and data collection

The primary data was collected through a questionnaire survey. A questionnaire was extracted from literature review of several factors affecting performance of construction projects and to identify the most important factors that influence construction projects implemented by Jimma University administration.

3.5 Data Measurement

In order to be able to select the appropriate technique of analysis, the level of measurement must be understood. In this research, an ordinal scale was used. Ordinal scale is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the agreement or disagree of influence (1, 2, 3, 4, and 5) does not indicate that the intervals between scales are equal, nor do they show absolute quantities.

3.6 Research instruments

The questionnaire designed for this study uses the information sourced from the extensive literature review, the global nature of the construction industry and relevance to Jimma University construction project context. The questionnaires were divided into three sections: Part 1which seeks to establish general details of the respondent, Part 2 Indicate the level of Significant to Project Success Factors Part, 3 which contained factors affecting performance of construction projects clustered into seven includes: project characteristics related factors, labor and material related factors, contractual relationship, project procedures, external environment, clients' related factors and contractors' related factors.

3.7 per-test

Taking into thought the significance and need to identify and establish weaknesses in the instrument that was used in the research study, the self-administered questionnaire wound be pretested before dispensing it to the respondents. The questionnaires was been reviewed and then tested on a small per-test sample of respondents with related characteristics as the study respondents. The per-test sample consisted of 2 from owner side and 7 from contractors' side who had been randomly selected and are excluded from final sample. Proposed recommendations for improvement of the questionnaire were gathered and an adjustment was made to obtain a refined instrument. Per-test helps in revealing questions that could be vague which facilitates their examination until they communicate the same sense to all the subjects.

3.8 Reliability of research instruments

The quality of data wound be measured, evaluated and guaranteed using appropriate techniques. The data quality was been assured and measured through internal validity instrument in to correct research instruments application for accurately measuring the variables during the data collection procedures. Besides, data constancy was checked using reliability test (Cronbach's Alpha methods). According to Sekaran (2010), reliability less than 0.6 are considered to be poor, those in the 0.7 range, acceptable, and those above 0.8 are good. The closer the reliability coefficient gets to 1.0, the better. Cronbach`s Alpha is a statistical test used to examine the internal constancy of the elements. As revealed the value of the Cronbach's Alpha for variables was 0.831 which is above 0.7 that is an indication of acceptability of the scale for further analysis.

Table3.1 cumulative and individual Cronbach's alpha

Cronbach's Alpha	Number of Items (average)
0.831	7

Source: primary data.

S/N	FACTORS	CRONBACH'S ALPHA
1	Project characteristics related factors	0.806
2	labor and material related factors	0.798
3	contractual related factors	0.749
4	project procedures related factors	0.834
5	external environment related factors	0.764
6	Client related factors	0.816
7	Contractor related factors	0.910
	Total	0.831

Source: primary data

Table 3.1 above shows that the values of Cronbach's Alpha for each filed of the questionnaire and the entire questionnaire.

3.9 Method of Data Analysis

The relative importance index method (RII) is used to rank owner and contractors' Perceptions of the relative importance of the key performance indicators in Jimma University Construction projects. Furthermore, the most important factors affecting the performance of Jimma university construction project were identified and ranked by using the relative importance index (RII). The relative importance index method (RII) was used now to determine owners and contractors perceptions of the relative importance of the main performance indicators (independent variables) in Jimma university As cited in Saleh Samir Abu Shaban thesis (2008) the relative importance index is computed by using the following formula (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007):

$$RII = \Sigma W / (A)\,(N)$$

Where;

RII= Relative Importance Index

W = Weight given to each factor by respondents ranging from 1 to 5

A = Highest weight, in our case 5.

N = Total number of respondents.

The multiple linear regression analysis was been used to determine owner and contractors' awareness of the main performance meters in Jimma University construction projects. The factors wound be analyzed using the multiple linear regression analysis. Linear regression is an method for modeling the association among a dependent/explained variable 'Y' and one or more explanatory variables denoted by 'X'. The case of one independent/explanatory variable is called 'simple linear regression' while for more than one independent/explanatory variable, the method is called multiple linear regressions, and this had been used in this study. It supports to understand which among the independent/explanatory variables was been related to the dependent variable, and to explore the forms of these related factors.

The model had been specified as follows:

$Y=\beta X + \varepsilon$ (2) …….……Equation 1

Where,

Y = Performance of construction projects

X = the matrix of independent/explanatory variables

β = the regression coefficients

ε = the error term.

Y represents performance of construction projects which is dependent on the explanatory

Variables X1, X2, X3…Xn, ε i.e. how much of the performance of construction projects is accounted for by each of the explanatory variables and how much is unexplained as measured by the error term ε. The regression model will be indirectly detailed as:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4\ X4 + \beta 5\ X5 + \beta 6\ X\ 6 + \beta 7\ X7 + \varepsilon$ (3) …….Equation 2

More exactly, the variables description was indicated as follows:

Y = Level of performance of construction projects.

β0 = the constant

X1… Xn = the factors subsidizing to improving the performance of construction Projects.

X1= Project characteristics related factors, X2= Labor and material related factors,

X3= Contractual related factors, X4= contraction related factors, X4= Project

Procurement related factors, X5= External environment factors, X6= Clients' related factors and X7= Contractors' related factors

β1… βn = the estimates of the independent variables. i.e. the coefficients of the independent Variables.

ε = the error term.

Epi-Data version 3.1 and Statistical Package for Social Sciences (SPSS) computer software version 25 will be used for this purpose. ` ` ` `

3.10 Ethical consideration

The study had been conducted after getting Ethical clearance from the Institutional Review Board of Jimma University Official letter of cooperation was also obtain from jimma University construction office. Participants in the study had been asked only on the voluntary basis. Written informed consent was been obtained from each participant prior to the interview to confirm willingness after explaining the objective of the study.

3.11 Dissemination plan

A copy of the final report of this study will be given to department of accounting and finance, college of business and economics, Jimma University and Jimma university construction office. The findings will be presented in different seminars, meetings and workshops and may also be made publically accessible through publications in international reputable journals.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Demographic Characteristics of Respondents

This chapter deals with results and discussions of the data that are categorized into two parts.

The first part treats the characteristics of the respondents which describe the study population by sex, age, background and marital status, while the second part deals with the analysis of findings of the study that were gathered through questionnaire interview. Therefore, the assigned personnel arranged how to access those respondents and their sections. Thus based on the prepared schedule 90 questionnaires were distributed to the participants and from these 12 respondents did not return the questionnaire. Due to this reason, 86.7% of the distributed questioners are collected, almost all respondent express their view properly.

Table 4.1.1 Demographic Characteristics of Respondents

Age category	Frequency	percent
20-30	19	24.4
31-40	51	65.4
41and gather	8	10.3
Total	78	100.0
Sex of the respondent		
Male	46	59
Female	32	41
Total	78	100
Marital status		
Single	26	33.3
Married	50	64.1
Divorced	2	2.6
total	78	100
Educational level		
Degree	34	43.6
Master	44	56.4
total	78	100

The above tables showed among the 78 respondent's majority of them were between ages 31-40years which was 51(65.4 %) followed by age between 20-30 years which was 19 (24.4 %). The sex composition of respondents were male 46(59 %) and females 32 (41%). The Marital status was single 26 (33.3 %) and married 50(64.3%). Educational back ground include majority

of the respondents were holders of Bachelor's degree 34(43.6%) and 44(56.3%) were master holders.

Table 4.1.2: Demographic Characteristics of Respondents

Respondent designation of organization	Frequency	percent
Officer engineer	24	30.8
Project manager	5	6.4
Site engineer	29	37.2
others	20	25.6
Total	78	100
Type of Jimma University projects you have been engaged		
road construction project	5	6.4
class room building projects	2	2.6
dormitory building projects	2	2.6
hospital building projects	4	5.1
stadium construction projects	18	23.1
hotel construction projects	24	30.8
office building projects	21	26.9
others	2	2.6
Total	78	100.0

The above tables are presented among the respondents designation in organization were site engineer 29(37.2%), officer engineer 24(30.8%) and others 20 (25.6%). From the 78 respondents, the type of projects they have been engaged were stadium construction projects 18(23.1%), hotel construction projects 24(30.8%) and office building projects 21(26.9%).

Table 4.1.3: Demographic Characteristics of Respondents

Respondent status	Frequency	percent
Owner	13	16.7
Contractor	64	82.1
Consultant	1	1.3
Total	78	100
Years of Work Experience		
0 to 5 years	22	28.2
6 to 10 years	43	55.1

11 to 15 years	11	14.1
16 to 20 years	2	2.6
Total	78	100.0

The above tables are displayed form 78 respondents Organization represents were owner 13(16.7 %) and contractor 65 (82.1%). The Work Experience of the respondents were 0 to 5 years 22(28.2%), 6 to 11years 43(55.1%) and 16 to 15 years 11(14.1%).

Table: 4.2: Description of project construction performance factors

The project you are engaged in would completed on time	Frequency	percent
Strongly disagree	15	19.2
Disagree	40	51.3
Neutral	16	20.5
Agree	6	7.7
Strongly agree	1	1.3
Total	78	100.0
The project you are engaged in would completed within budget		
Strongly disagree	43	55.1
Disagree	24	30.8
Neutral	5	6.4
Agree	6	7.7
Total	78	100.0
The project you are engaged in would completed with specified quality		
Strongly disagree	1	1.3
Disagree	2	2.6

Neutral	22	28.2
Agree	46	59.0
Strongly agree	7	9.0
Total	78	100.0

The above table showed respondents replied 40 (51.3%) disagree, 16(20.5%) neutral and strongly disagree 15(19.2%) on projects that were engaged in Completed on time. From 78 respondents answered 43(55.1%) strongly disagree and 24(30.8%) disagree about projects that were engaged in have been completed within budget. Respondents rated projects that were engaged in will be completed with specified quality were Agree 46(59%) and Neutral 22(28.2%).

4.2 Analysis and Presentation of the results from primary data by using Relative Importance Index (RII)

The analysis of the results using the RII is to show and rank the most influential factors that affect the construction project performance in Jimma University. The seven independent factors that are identified as the major cause of the construction project performance problems.

4.2.1 Project characteristics related factors

The respondents' response on project characteristics related factors in the Jimma university construction project as it is analyzed by RII is interpreted as follows. Nature of project Emergency ranked at the first place with RII of 0.64 values and followed by Additional work at owner's request with RII of 0.626 values, high influential factors construction projects. The project complexity that is ranked the least level by the respondents is contradicted with the finding of the Helen (2016), as they put it on the top influential factors affecting the project performance in their study; so it need further investigation.

Table 4.3 Project characteristics related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Nature of project Emergency	10	3	42	8	15	0.64	1st

Additional work at owner's request	-	23	27	23	5	0.626	2nd
Design changes	1	32	27	15	3	0.566	3rd
Shorter completion period given for the contract	4	24	32	16	2	0.559	4th
Complexity of project, is small	12	14	46	6	-	0.518	5th

Source: primary data

4.2.2 Labor and material related factors

The respondents' answer on project labor and materials related factors in the Jimma university construction project performance as it is analyzed by RII is interpreted as follows. Escalation of material prices ranked at the first place with RII of 0.828 values and followed by insufficient supply of materials with RII of 0.759 values. Since it has impact on the project, cost overruns hence the delays of the projects. This finding is the same with the finding of the Helen (2016), Melba Abbas et, al. (2015), Adnan Enshassi et al. (2009). Insufficient supply of materials (RII ranked at the second level. This is ranked second level by the respondents showing that the insufficient supply of materials to use in the project construction result in the problem of the project quality. Unavailability of Skillful workers was the least influential factor of jimma university construction projects performance.

Table 4.4 Labor and material related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Escalation of material prices	-	4	8	39	27	0.828	1st
Insufficient supply of materials	-	4	14	59	1	0.759	2nd
Improper Quality control of materials	-	9	38	29	2	0.661	3rd
Unavailability of Skillful workers	-	13	40	24	1	0.633	4th

Source: primary data

4.2.3 Contractual related factors

Among the most influential contractual related factors that affect the project performance in the Jimma university construction projects that ranked the first level is Control mechanism of the project activities is Poor with RII equals 0.746 and second is followed by Overall management actions are Ineffective RII 0.712 in line to the findings of Aftab Hamed Memon et al. (2014) and Saraf D.D. (2013). This factor, among others, is the most important one and high influence factor. The Poor communication system among project participants are the least in RII 0.605 influential factors on construction project performance of jimma university.

Table 4.5 Contractual related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Control mechanism of the project activities, is Poor	1	15	19	42	1	0.746	1st
Overall management actions, are ineffective	-	11	18	48	1	0.712	2nd
Contract type, is full contract	-	33	14	25	6	0.610	3rd
Poor communication system among project participants	2	26	21	26	3	0.605	4th

Source: primary data

4.2.4 Project procurement related factors

Among the factors that affect the project performance of the Jimma university construction projects of project procurement related factors, Project materials monopoly by some suppliers are the first RII 0.818 and the second is followed by Procurement method and Engineering estimate stage evaluation RII 0.530 and Tendering method least factors influence RII 0.510. According to the following rank Project materials monopoly by some suppliers were high influence factors on construction projects performance of Jimma University.

Table 4.6 Project procurement related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Project materials monopoly by some suppliers	-	6	4	45	23	0.818	1st
Procurement method and Engineering estimate stage evaluation	-	39	29	8	2	0.530	2nd
Some tendering maneuvers by contractors, such as front-loading of rates	-	55	-	22	5	0.52	3rd
Tendering method	-	51	16	6	5	0.510	4th

Source: primary data

4.2.5 External environment related factors

The factor effects of jimma university construction project performance which is related to external environment factors and summarized in the following table 4.7. As it was displayed here in the table Political environment is the most serious factor that is affecting the project under consideration and followed by Physical environment of sites which is in line with the finding of

Nipin (2015). Economic environment which is the least RII 0.515 influential factors for external environment related factors.

Table 4.7 External environment related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Political environment	-	7	26	43	2	0.703	1st
Physical environment of sites	-	40	22	15	1	0.542	2nd
Social environment of sites	3	32	31	11	1	0.541	3rd
Economic environment	2	43	20	12	14	0.515	4th

Source: primary data

4.2.6 Clients related factors

Among the most influential client related factors that affect the project performance in the Jimma university construction project performance that ranked the first level is Delay of progress payment to contractors with RII equals 0.838 which is in line to the findings of Aftab Hamed Memon et al. (2014) and Saraf D.D. (2013). This factor, among others, is the most important one because of Jimma university construction projects schedule delays are the most bolded problem. The Size of client's organization, large with RII of 0.628 is the most influential factor ranked at the second level by the respondents in the Jimma university construction projects. Clients emphasize on quick construction instead of quality is last rank RII 0.589 lowest influence on construction project performance.

Table 4.8 Clients related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Delay of progress payment to contractors	-	3	5	44	26	0.838	1st
Size of client's organization, is large	-	28	20	23	7	0.628	2nd
Client's ability to make project decisions	-	13	18	37	10	0.611	3rd
Client's emphasize on low construction cost	-	24	35	18	1	0.593	4th
Client's emphasize on quick construction instead of	1	24	32	20	1	0.589	5th

quality

Source: primary data

4.2.7 Contractors related factors

The result from table 4.9 below indicates that all respondents agreed that the most important contractor related factors that affect the project performance of Jimma university construction, Project team leaders working relationship with others RII 0.83 the first high influence on construction Project. The second most influential factor followed with Project leader's early and continuous involvement in the project RII 0.78. Project staffs commitment to meet cost, time and quality planning effort least influence on construction projects.

Table 4.9 Contractors related factors

Lists of factors	Scale						
	1	2	3	4	5	RII	Rank
Project team leaders working relationship with others	1	2	11	35	29	0.832	1st
Project leaders early and continuous involvement in the project	7	1	7	40	23	0.785	2nd
Motivating skills of the project staffs	-	20	15	35	8	0.721	3rd
Project team leaders experience	1	2	40	23	12	0.710	4th
Technical skill of the project staffs	-	8	40	15	15	0.698	5th
Budget progress monitoring	-	18	37	12	18	0.668	6th
Control of subcontractors works	-	20	21	27	9	0.656	6th
Implementing an effective safety, quality assurance and environmental program	-	40	6	12	20	0.636	8th
Project staffs commitment to meet cost, time and quality Planning effort	-	25	30	12	11	0.627	9th

Source: primary data

4.2.8 Top ten factors that affect the project performance

Top ten most influential factors are taken from seven basic independent variables which are identified by the respondents. Those factors listed from one up to ten are that needs the special consideration in the jimma university construction projects. As already discussed each factor one by one in previous section, the below listed factors are causing the problem of project delay, project cost overrun and project quality problem.

Table 4.10 top ten most influential factors

S/N	Lists of top ten factors	RII	Rank
1	Delay of progress payment to contractors	0.838	1st
2	Project team leaders working relationship with others	0.832	2nd
3	Escalation of material prices	0.828	3rd
4	Project materials monopoly by some suppliers	0.818	4th
5	Project leaders early and continuous involvement in the project	0.785	5th
6	Insufficient supply of materials	0.759	5th
7	Control mechanism of the project activities, is Poor	0.746	7th
8	Motivating skills of the project staffs	0.721	8th
9	Overall management actions, is Ineffective	0.712	9th
10	Project team leaders experience	0.710	10th

Source: primary data

4.2.9 The ranking of the seven basic independent variable

In above section it was seen that the ranking of the individual factors under each independent variables and ranked and interpreted accordingly. But, under this section we are going to see the average of the seven basic independent variables to indicate which independent variables are the most influential factors as a group. The following table 4.10 shows this fact.

Table 4.11 ranking of seven basic independent variables

S/n	Variables	Average of RII	Rank
1	Contractor related factors	0.723	1st
2	Labor and material related factors	0.722	2nd
3	Contractual related factors	0.668	3rd
4	Clients related factors	0.653	4th
5	Project procurement related factors	0.595	5th
6	External environment related factors	0.585	6th
7	Project characteristics related factors	0.582	7th

Source: primary data

As it is seen from table 4.11 the Contractor related factors were the most influential that hinder the project success in the jimma university construction project performance with average of RII equals 0.723. Under the Contractor related factors Project leaders early and continuous involvement in the project, Project team leaders working relationship with others, Project team leaders experience and Technical skill of the project staffs were among the factors of construction projects performance in jimma university. Therefore, identifying those Contractor factors and taking the necessary measure to ensure the project performance is very important issues. The second most influential factor that affects the construction project performance in Jimma University was Labor and material related factors with average of RII equals 0.722. Escalation of material prices, insufficient supply of materials and client emphasis on quick construction instead of quality were among the factors contributed to Labor and material related factors. The Labor and material is the base for any action towards the project performance. Therefore, it is expected from the Labor and material to improve the Labor and material related factors that obstacle the performance of the project under consideration. Other factors that were ranked from three to seven are respectively: Clients related factors, Contractual related factors, Project procurement related factors, External environment related factors and Project characteristics relate factors. When it summarized, contractor and labor and material related factors from both point of view are the most influential factors.

4.3 Multiple linear regression assumptions

Testing assumption of multiple linear regression analysis models is very important before running regression analysis. So each assumption results were discussed in the following subtopics. This paper the descriptive and inferential analysis was carried out separately with the existence of association between the dependent and independent variables with the identifying factors affecting construction project performance of Jimma University. However identification of these factors is not enough for meaningful conclusion. Therefore the influence each independent variable must be assessed and identified sequentially. The researcher used multiple liner regression models to identify the effects of seven factors on construction project performance in the Jimma University.

4.4 Multicollinearity Test between independent variables

According to Gujarati (2003) Multicollinearity tests helps identify the high correlation between explanatory variables and to avoid double effect of independent variable from the model. When independent variables are multicollinear there is overlap or sharing of predictive power. Predictor variable should be strongly related to dependent variable but not strongly related to each other. This may lead to the paradoxical effect, whereby the regression model fits the data well but, none of the explanatory variables (individually has a significant impact in predicting the dependent variable. For this purpose variance inflation factor (VIF) and tolerance test were used to check Multicollinearity for variables if the value of VIF is less than 10 there is no Multicollinearity and on the other hand if VIF greater than or equal to 10 there is a serious Multicollinearity problem. According to Gujarati (2003) to avoid serious problem of Multicollinearity omitting the variable with 10 and more from the analysis. In addition tolerance is an indicator how much of the variability of independent variable is not explained by the other independent variable in the model and is calculated using the formula 1- R^2 for each variable. If the value is very small (less 0.1), it shows the multiple correlation with other variable is high.

Table 4.12 Multicollinearity statistics

Variables	Tolerance	VIF(variance inflation factors)
Project characteristics related factor	0.364	2.744
Labor and material related factor	0.846	1.182

contractual factor	0.764	1.309
Project procurement	0.59 7	1.676
External environment	0.572	1.750
Client related actor	0.803	1.245
Contractors related factors	0.311	3.212

Source; Own survey data, 2021

Table 4.3 shows the computation result that the value of VIF all variables were by far less than 10 and the value of tolerance statistics being above 0.1 they were accepted entered in to regression model for the estimation of variables.

4.5 Normality test

Normality assumption is around the mean of the residuals is zero and used to determine whether a data set is well modeled by a normal distribution or not and also to indicate un underlying random variable is to be normally distributed (Gujarati.2009). There the researcher was used histogram methods of testing the normality of the data. If the residuals are normally distributed about its mean of zero, the shape of histogram should be a bell-shaped and regression standardized residual plotted between -3.3 and 3.3. From the figure below data normality can be indicated.

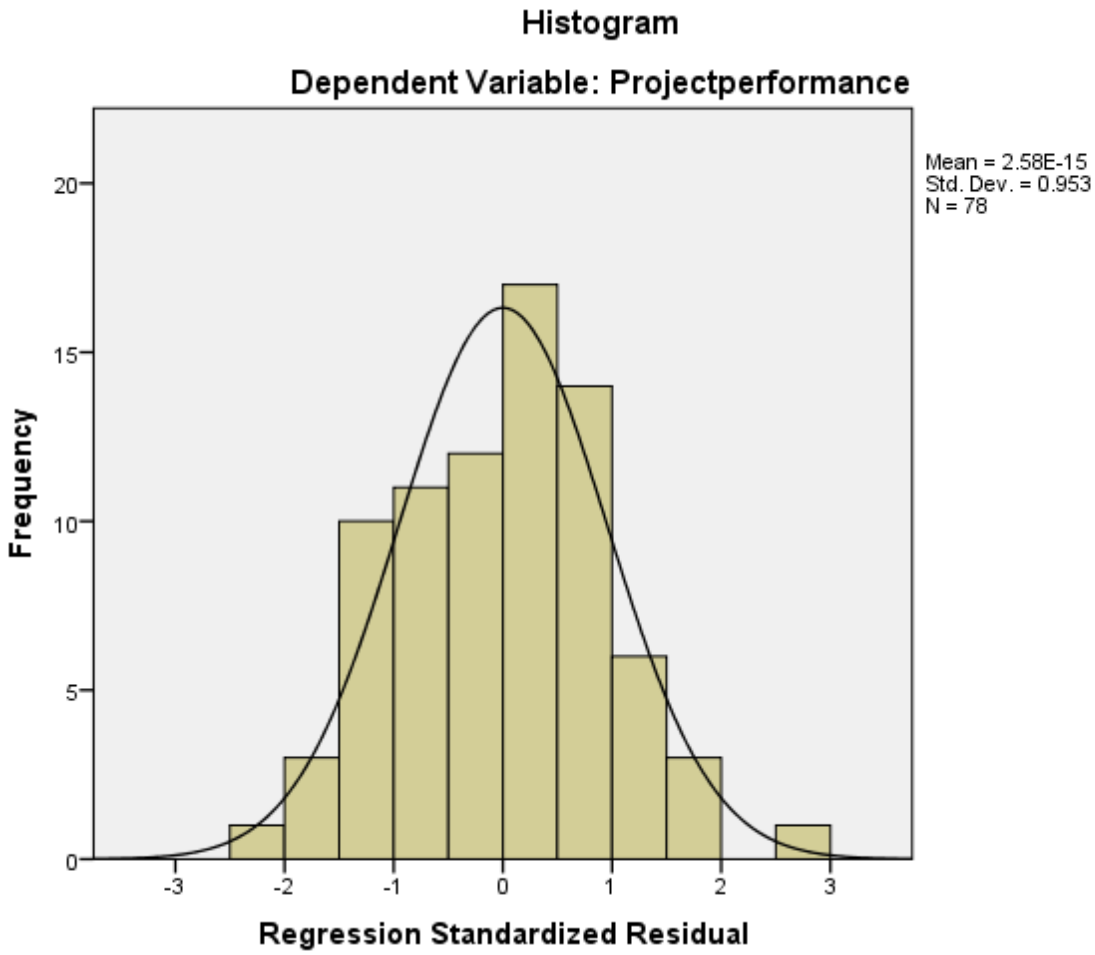


Figure 2: Normal distribution Histogram results
Source; survey result, 2021

4.6 Linearity Test

Linearity is used check whether all the estimates of regression including regression coefficients, standard errors and tests of statistical significance are biased or not (Keith, 2006). This can be checked by p-p plot residuals as indicated by figure 2 below. There is no linearity problem on the data for this study if p-p residual follow at straight line.

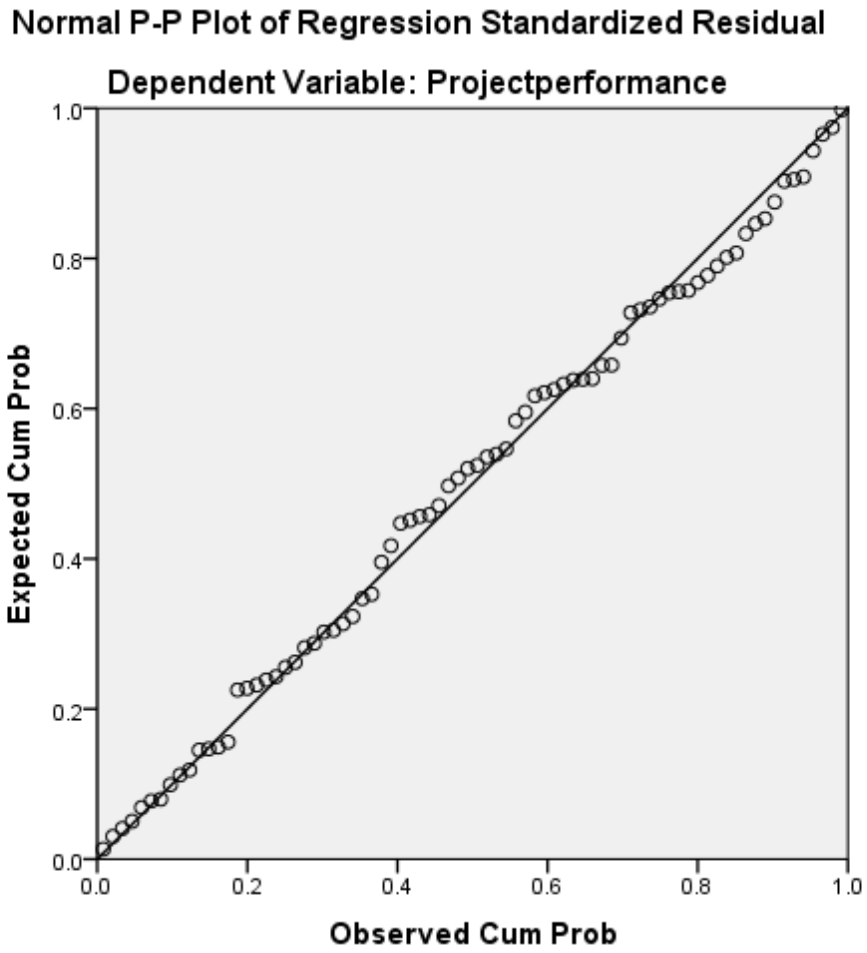


Figure 3: p-p plot; Linearity test results

Source; survey result, 2021

4.7 Heteroscedasticity test

Heteroscedasticity is the equality or violation of the residuals for every set of values for independent variable. So the researchers assume that errors are spread out constantly between the variables. Heteroscedasticity problem exist when scatterplot is greater than 3.3 and less than -3.3. Therefore as it was indicated in figure 3 below the data did not violate Heteroscedasticity assumption and instead it was homoscedastic.

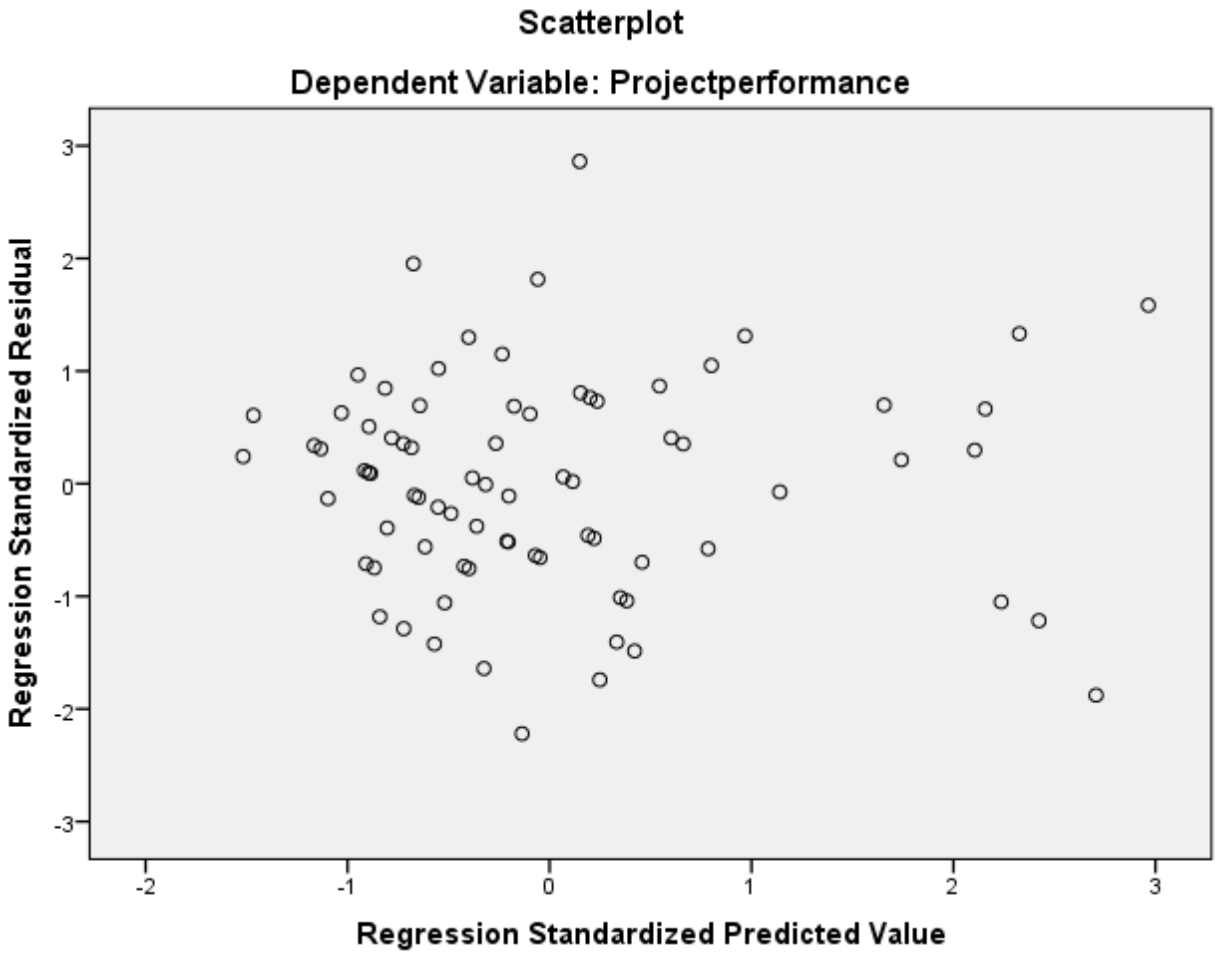


Figure 4: Scatterplot Heteroscedasticity test result

Source; Survey result, 2021

4.8 The effect of independent variables on project performance

After the model assumption was checked presentation and interpretation of the analysis output is mandatory. The prediction or estimation of the value one variable (the dependent or the predicted variable; called as Y from one or more independent or predictor variables (called as X) (Keith, 2006).

Table: 4.13 Models Summery

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.683	.466	.413	.48734	2.255

a. Predictors: (Constant), Contractors related factors, Construal related factor, Labor and material related factor, Client related factor, Project procurement, External environment and Project characteristics related factor
b. Dependent Variable: Project performance

The above table shows that R value is 0.683 which indicates there is a positive relationship between project performance and independent variables namely; Contractors related factors, Construal related factor, Labor and material related factor, Client related factor, Project procurement, External environment and Project characteristics related factor. 46.6% of project performance accounted for by independent variable. In the model summary adjusted R square tells us the goodness fit of the model and its value which is 0.413 means the seven all independent variables are able to measure/predict project performance at 41.3 (0.413 x100) percent. However, the remaining 58.7% could be some other variable which had not been considered in this study. The marginal value provides the impact that unit changes in the individual independent variable have on different levels of project performance when all other variables held constant.

Table: 4.14 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	14.504	7	2.072	8.724	.000[b]
Residual	16.625	70	.238		
Total	31.129	77			

As indicated in table 4.19 the total sum of square (31.129) is equal to the sum of explained sum of square (14.504) and residual sum of squares (16.625). The study of these total sum squares is known as analysis of variance (ANOVA) from regression point of view. To assess the statistical significance of the result, it is necessary to look in the table labeled ANOVA. The ANOVA table indicates the model as a whole is reasonably fit and significant association between independent variables and project performance. This means the value of F is 8.724 (mean square of regression divided by mean square of residual), and it is significant at p value 0.000 ($p<0.05$). It can be calculated that this dimensions have significant impact on Jimma university project performance.

Table: 4.15 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.957	.717		1.335	.186	-.473	2.387
Project characteristics related factor	.195	.137	.205	1.419	.160	-.079	.468
Labor and material related factor	.040	.152	.025	.266	.791	-.263	.344
Construal related factor	-.063	.125	-.050	-.500	.619	-.312	.187
Project procurement	.099	.152	.073	.648	.519	-.205	.403
External environment	-.006	.123	-.006	-.051	.959	-.251	.238
Client related factor	-.146	.132	-.108	-1.105	.273	-.408	.117
Contractors related factors	.501	.161	.488	3.120	.003**	.181	.822

a. Dependent Variable: Project performance

** Significant p<.05%, p<.01

The dependent (Y) and independent (X) variables relationship can be explained as;

$Y=\beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\beta5X5+\beta6X6+\beta7X7+e$, Where β0 is constant, βn is the coefficient of independent variables (Satendra et, 2011). The researcher was used unstandardized beta coefficients to compare or prioritize the effect of independent variables on independent variable and to construct regression equation. If we substitute the coefficient from the above table the equation becomes;

Project performance = 0.957+ (0. 195) Project characteristics related factor + (0. 040) Labor and material related factor + (0. 063) Construal related factor + (0. 099) Project procurement+ (0. 006) External environment + (0. 146) Client related factor + (0. 501) Contractors related factors.

From this we can understand that the marginal values provide the impact that a unit change in the individual independent variables has on different Project performance when other variables are apprehended continuous. According to the above table results from independent variables only Contractors related factors are significant factors.

4.9 Discussion of the finding/model interpretation

Multiple Linear regressions were performed to test the spotted independent variables to answer the research questions based on the research problem and objectives. Among factors affecting construction project performance in Jimma University, Contractors related factors were significantly affecting jimma university project performance at P value 0.003 probability levels.

The adjusted R square (Coefficient of Determination), can be defined as the proportion of the total variation or dispersion in the performance of construction projects (dependent variable) that explained by the variation in independent variables in the regression. (Gujarati, 2004) So with adjusted R Square value of 0.413, meaning, 41.3% of the variation in construction performance is explained by the linear relationship with all the independent variables. The corollary of this is 58.7% of the variation in construction performance is unexplained by the relationship. Thus when adjusted R square it means that the independent variables included in the study play an important part in affecting the dependent variable.

The individual effects of the independent variables can be explained by their respective beta coefficients. As per the regression result, the construction performance and contractor related factors have the strongest positive relationship. 1-unit increment in improving contractor related factors can cause about 50.1% improving performance of construction projects. This corroborates with the views of Jamaludin et al., (2014), Assaf et al., (2001) and Chan et al., (2002) who found in their respective studies that increasing the contractor related factors would have a positive influence on construction performance. They celebrated that high experience and skills of personnel complex in a construction project will support the project celebrations to implement their project goals professionally leading to better performance of quality, time, cost, productivity and safety of the project. Construction planning is a crucial element in confirming the project achievement. The main reason contractors' were not known at early the sites and weakens of the project leaders. According to Chan and Kumaraswamy (2002) studies contractors' related factor was proposed specific technological and managerial strategies to increase construction performance.

Contractors related factors were ranked the 1st Influential factors construction project performance. Callistus et al. (2014) concluded that the factors affecting quality performance of

construction firms in Ghana based on Consultants and Contractors view are: fraudulent practices and lack of coordination between designers and contractors, poor monitoring and feedback are few of them. Lack of training on quality for staff, lack of management leadership as well as lack of previous experience of contractor was also identified.

Labor and material related factors were ranked the 2nd Influential factors construction project performance. It is recommended that basic material and works quality assurance mechanism be in place. Productivity can be affected if required materials, tools, or construction equipment for the specific are not available at the correct location and time. As discussed in Zarihun Kifle (2017) thesis, materials related constraints are shortage of materials, material fabrication delay, slow delivery of ordered materials, and noncompliance of material to specification, unforeseen material damages and material procurement problem.

CHAPTER FIVE

Summary of finding, Conclusion and Recommendation

5.1: Introduction

This chapter explained the discussion of major Summary findings, conclusion drawn from the findings and recommendation made regarding to the study. The conclusions and recommendations drawn were focused on addressing the objective of the study.

5.2: Summary of major findings

This research was conducted in Jimma University for identifying factors affecting the Performance of its construction projects and to see their relative with the performance of construction projects. The ANOVA test formed a P-value of 0.003 which is below the alpha level, i.e. 0.05. This means that the general independent variables (contractors' related factors) have statistically significant association with that of the dependent variable for Performance of construction projects. 41.3% of the deviation in jimma university construction projects performance is described by the linear association with all the independent variables. As per the regression result, the contractor related factors (β=0. 501) have a strong positive significant relative. The project characteristics related factors, labor and material related factors, contractual related factors, project procurement, external environment and clients' related factors were not the significant factors. The contractor related factors and labor and material related factors are the most influential that hinder the project success in the jimma university construction project performance with average of RII equals 0.723 and 0.722 respectively. Project characteristics relate factors are the least influential factors in the jimma university construction project performance with average of RII equals 0.582.

5.3: Conclusion

The contractor related factors were the most influential that hinder the project success in the jimma university construction project performance with average of RII equals 0.723. Under the contractor related factors project leaders early and continuous involvement in the project, project team leaders working relationship with others, project team leaders experience and technical skill of the project staffs were among the factors of construction projects performance in Jimma University. Therefore, identifying those contractor factors and taking the necessary measure to

ensure the project performance is very important issues. The second most influential factor that affects the construction project performance in Jimma University was labor and material related factors with average of RII equals 0.722. Escalation of material prices, insufficient supply of materials and client emphasis on quick construction instead of quality were among the factors contributed to labor and material related factors. Based on these finding, owners, contractors and project team leaders enhance early and continuous involvement in the projects and smooth working relationship with others specifically project team leaders experience and technical skill of the construction project staffs in order to improve and maintain project success in construction project performance in Jimma University. On the other hand, owners fulfill sufficient supply of construction materials emphasis a strong consideration of construction project quality.

5.4: Recommendation

Based on the research findings, the following recommendations are forwarded to jimma university contraction projects

- Contractors should have enhanced further for skilled workers who are accessible in all sides at both office and site will solve related problems on proper construction management, quality of work, cost control and time management.
- There should be accurate construction planning and management to guarantee the delivery of a project on schedule and within budget is only feasible by having technically talented skilled staffs.
- Jimma university construction Project leaders' should have early & continuous involvement in the project to get on time suggestion about their sites, to work on problems, regulating plan to partner actual site conditions.
- There should be government control for the escalation of material prices and improper quality of materials in construction projects.
- The owner of the projects and government should solve lack of supply of materials and skill of workers.
- There should be government and projects owners who are selecting a competent contractor for a job that is serious for the successful delivery of a construction project and to solve the problems of the escalation of material prices and improper quality of materials in construction projects.

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APPENDIX

Jimma University

Business and Economics College

Survey Questionnaire

I am a graduate student undertaking Master of Arts (MA) Degree in Project Management and Finance in Jimma University, College of Business and Economics, Department of Accounting and Finance and I am currently conducting a research entitled "**Factors affecting constriction projects performance in Jimma University, Ethiopia".** You have been selected to assist by providing the required information because your views are considered important to this study. I am therefore kindly requesting you to fill this questionnaire. Please note that any information given will be treated with utmost confidentiality and will only be used for the purpose of this study.The above information regarding my participation in the study has been clear and brief to me. I will have given a chance to ask questions if I have. I am voluntarily participating in this study. I understand that my records will be kept private and that I can leave the study at any time. I would like to assure my willingness below by signature.

Part 1. Give your Background Information in the Space Provided below			
Position	_____	Age:	_____
Educational Level:	_____	Sex:	_____
		Marital	_____
Specialization :	_____	Status	
Experience :	_____		_____

Thank you very much for your time and cooperation and forward to your response.

Yours Sincerely,

Gosa Kene

Mobil phone: +251923579080, Email: gosayekene@gmail.com

_____

Signature of the Investigator Date _____

Part 2: Give your opinion to each of the following questions by putting tick mark (√) on the appropriate choice(s). You can select more than one choice whenever necessary.

1. Which organization do you represent?
   - ( ) Client [Owner]
   - ( ) Contractor
   - ( ) Others (specify_____
2. Respondent Designation in the organization
   - ( ) Owner
   - ( ) Office Engineer
   - ( ) Project Manager
   - ( ) Site Engineer
   - ( ) Others (specify)_____
3. Years of Work Experience
   - ( ) 0 to 5 years
   - ( ) 6 to 10 years
   - ( ) 11 to 15 years
   - ( ) 16 to years
   - ( ) Above20 years
4. In what type of Jimma University projects' you have been engaged in
   - ( ) Road Construction project
   - ( ) Hotel Construction projects
   - ( ) Class room Building Projects
   - ( ) Apartment building Projects
   - ( ) Dormitory Building Projects
   - ( ) Office building Projects
   - ( ) Hospital Building Projects
   - ( ) Library building Projects
   - ( ) Stadium Construction projects
   - ( ) others, _____
5. What period did you take to complete the construction project you have mentioned above?
   - ( ) less than 5 years
   - ( ) 10-15 years

( ) 5-10 years ( ) Not Completed yet

6. How do you evaluate Performance of projects at Jimma University?

( ) High Performance ( ) Low Performance

( ) Medium Performance ( ) Others, _____

7. . Which of the following do you believe contributes to the low Performance of projects at Jimma University?

( ) Problem in project design ( ) Problems related to Finance

( ) Problem related to labour ( ) Problems related to technology

( ) Problem related project Management ( ) Contract administration Problems

( ) Problem related to material ( ) others, _____

Part 3: Indicate your level of Significant to each of the following performance factors of projects at Jimma University.

5 = Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1= Strongly Disagree

No	Project construction performance at Jimma university	scale					Remark
	Project performance Factors						
1	The project you are engaged in will be completed on time	5	4	3	2	1	
2	The project you are engaged in will be completed within budget	5	4	3	2	1	
3	The project you are engaged in will be completed with specified quality	5	4	3	2	1	
4	The project you are engaged in will provide stakeholder's satisfaction	5	4	3	2	1	
5	The project you are engaged in will provide user satisfaction	5	4	3	2	1	

Part 4: Indicate your level of Significant to each of the following Factors the Performance of Construction Projects based on your experience on any of Jimma University projects you are engaged in.

5 = Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1= Strongly Disagree

No	Groups/Factors	scale					Remarks
	(1)Project characteristics related factors						
1.1	Nature of project Emergency	5	4	3	2	1	
1.2	Complexity of project, is Small	5	4	3	2	1	
1.3	Shorter completion period given for the contract	5	4	3	2	1	
1.4	Additional work at owner's request	5	4	3	2	1	
1.5	Design changes	5	4	3	2	1	
	(2) Labor and material related factors						
2.1	Unavailability of Skillful workers	5	4	3	2	1	
2.2	Improper Quality control of materials	5	4	3	2	1	
2.3	Insufficient supply of materials	5	4	3	2	1	
2.4	Escalation of material prices	5	4	3	2	1	
	(3)Contractual related factors						
3.1	Poor communication system among project participants	5	4	3	2	1	
3.2	Contract type, is full contract	5	4	3	2	1	
3.3	Control mechanism of the project activities, is Poor	5	4	3	2	1	
3.4	Overall management actions, are Ineffective	5	4	3	2	1	
	(4) Project procurement						

4.1	Tendering method	5	4	3	2	1	
4.2	Procurement method, Engineering estimate evaluation	5	4	3	2	1	
4.3	Some tendering maneuvers by contractors, such as front-loading of rates	5	4	3	2	1	
4.4	Project materials monopoly by some suppliers	5	4	3	2	1	
	(5)External environment						
5.1	Economic environment	5	4	3	2	1	
5.2	Social environment of sites	5	4	3	2	1	
5.3	Political environment	5	4	3	2	1	
5.4	Physical environment of sites	5	4	3	2	1	
	(6) Clients related factors						
6.1	Size of client's organization, is large	5	4	3	2	1	
6.2	Client's emphasize on low construction cost	5	4	3	2	1	
6.3	Client's emphasize on quick construction instead of quality	5	4	3	2	1	
6.4	Client's ability to make project decisions	5	4	3	2	1	
6.5	Delay of progress payment to contractors	5	4	3	2	1	
	(**7) Contractors related factors**						
7.1	Project team leaders working relationship with others	5	4	3	2	1	
7.2	Motivating skills of the project staffs	5	4	3	2	1	

7.3	Project team leaders experience	5	4	3	2	1	
7.4	Project staffs commitment to meet cost, time and quality Planning effort	5	4	3	2	1	
7.5	Budget progress monitoring	5	4	3	2	1	
7.6	Technical skill of the project staffs	5	4	3	2	1	
7.7	Project leaders early and continuous involvement in the project	5	4	3	2	1	
7.8	Implementing an effective safety, quality assurance and environmental program	5	4	3	2	1	
7.9	Control of subcontractors works	5	4	3	2	1	

Thank you!!!