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INVESTIGATING SUCCESS FACTORS FOR REAL ESTATE DEVELOPMENT CONSTRUCTION PROJECTS IN ADDIS ABABA

By: MELAT GIRMA

ID.No.: SGS/0662/2007A

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List of Abbreviations and Acronyms

UNEP	United Nations Environment Program
MoFED	Ministry of Finance and Economic Development
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
EHS	Environmental Health Safety
PPE	Personal Protective Equipment
KPIs	Key Performance Indicators
SME	Small and Micro Enterprises
CSF	Critical Success Factors

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Abstract

This study entitled "Investigating Success Factors For Real Estate Development Construction Projects with Special Reference to Real Estates in Addis Ababa City" is conducted with an objective of assessing the factors that contributes to the success of projects management in real estate development construction projects. The study has met its objectives through providing answers for the basic questions of how successful real estate development construction projects' management are, what are the major success factors for real estate development construction projects management; and what is the impact of success factors in real estate construction projects' management. The study area is not adequately studied from Ethiopian real estate development companies' perspective or not available which makes this study is valuable to fill in the study area. The study is conducted on real estate developers in Addis Ababa. Both primary and secondary data were collected for the accomplishment of the study. For the primary data, 118 project managers who are working in 26 real estate development companies which delivered at least one round of residential houses were selected. All the project managers who have completed at least one real estate development construction projects are incorporated in the study making the study to implement censes method. The primary data are collected through self-administered questionnaires. The study have used Ashley & Jaselskis's (1987) seven critical success factors of construction projects as independent variables where project success is measured in terms of time, cost and quality are used as dependent variables. Correlation technique was used to indicate the relationship between the independent and dependent variables and a binary logistic regression was used to identify the impact of the success factors over successful project completion. Four out of the seven critical success factors are found to be present in the real estate development construction projects which are organizational planning, project manager goal commitment, project's scope and work definition, and control systems. Six of the seven critical success factors (except project scope and work definition) are found to have as significant impact on project management success. Though, only four have a positive impact which are project team motivation and goal orientation, project managers' competency and goal commitment, safety precautions and applied procedures and control systems which is the major finding of the study.

Key words: *Project Management, Project Management Success, Critical Success Factors, Success Criteria, Time, Cost, Quality, Organizational Planning, Safety, Competency and Experience, Motivation and Commitment, Control Systems and Scope.*

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CHAPTER ONE

INTRODUCTION

1.1. Study Background

Among many others, the construction industry is a contributor and an indicator of a nation's development. As defined by UNEP (1996), construction is an economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, etc. One-tenth of the global economy is devoted for the construction sector on the activities of building and arranging homes and offices (UNEP, 1996). The sector is also one of the largest job creators and resource mobilizers in developing countries.

Construction sector is playing greater role in the development of Ethiopian economy. It is creating job opportunities to the wide unskilled workforce (due to its labor intensive nature), creating market opportunities for suppliers, facilitating the growth of other sectors and generating income for the government (Ethiopian Economic Association, 2008). Most importantly, the sector is contributing in filling long came poor construction infrastructures of the nation.

Residential house building is among the constituents of the nation's construction sector (MoFED, 2005). Several real estate companies in Ethiopia are mobilizing considerable amount of resources conducting number of projects in the development of residential buildings. As construction projects are known to be notorious to be completed in schedule and budget, most of the real estates in Ethiopia are observed to fail to complete and deliver the residential buildings according to plan. This calls for the critical factors that might contribute for the success or failure of real estate construction projects to be identified and focused on.

Success factors for projects can be perceived as main variables that contribute to projects' success (Dvir, 1998) and as levers that can be operated by project managers to increase chances of obtaining the desired outcomes (Westerveld, 2003). A combination of factors determine the success or failure of a project and influencing these factors at the right time makes success more probable (Savolainen, 2012).

Identifying the relationship between project success factors and project success has been the interest of several researchers. Long list of researchers have investigated how critical success factors could contribute to the successful completion of projects. Pocock and Kim (1997), Pinto and Mantel (1990), Sherman and Wideman (2000), Yeo (2002), Milis and Mercken (2002), Pheng and Chua (2006), Olander and Landin (2005) and Fortune and White (2006) are among the researchers who were concerned with the understanding of factors in project management that contribute to successful project performance.

In developing countries such as Ethiopia, construction resources are too precious to be wasted. This calls for the identification and availability of project success factors to enhance the likelihood of project success. However, no single study in the study area is found available conducted in Ethiopian context. In this study, it is tried to investigate how construction projects are being managed in the nation's real estate sector and the project management is influencing project success. Investigating what are the critical factors for success in real estate construction projects and how strong their influence is on project success is the complete focus of this study.

1.2. Statement of the Problem

In the past few years, the real estate sector of Ethiopia has been demonstrating growth following increasing demand for residential houses in cities and the above 20% growth of the construction sector (Ethiopian economy report, 2014). The number of licensed real estate developers and resources allotted are growing from time to time. Currently, 1,375 real estate construction companies are licensed with an investment worth of birr 22.3 billion (Ethiopian Investment Agency, 2016).

Despite all this real estate developers and massive housing projects conducted by the government, the question of residential houses is far beyond being responded adequately. One reason for this is the real estate developers' failure to deliver what is expected. According to the Ethiopian Economy Report (2014), only 4.5% of licensed projects are operational while only 60% of the licensed real estate developers are willing to renew their license at the point of expiration. For the functional projects also it is observed for the real estate developers to fail to deliver projects in line with schedule. Constraints in the capacity and performance of local contractors and consultants, poor quality and productivity, ineffective utilization of appropriate construction technologies, and lack of proper application of building regulations and standards are also challenges of the nation's construction and real estate sector (Minister of Urban Development and Housing Construction Report, 2015).

The real estate sector shares the responsibility of addressing the increasing demand for residential houses in the nation's major cities. Moreover, it is the nation's precious resources that are being wasted whenever construction projects are turned out to be a failure. This calls for improvements to always be made on current practices to assure proper utilization of resources and successful conversion of resources in to outputs. To increase the likelihood of real estate construction projects, it worth studying the major success factors in the real estate construction projects and to what extent the success factors are impacting project success.

Though it has been arguable between scholars of how to measure project success, most agree the requirement of critical success factors for successful project completion. Project success factors are the elements of a project which, when influenced, increase the likelihood of success; these are the independent variables that make success more likely (Turner, 1999).

These success factors need to be identified and focused on from the initialization stage of a project so that they could influence the project as much as expected. Rockart (1982) mentioned that to ensure future success, a company and its industry should identify its critical success factors.

Various studies have been conducted in the study area with the intent of identifying success factors for projects and how they contribute for the successful completion of projects. The study conducted by Ashley & Jaselskis's (1987) produced one of the famous findings in the study area identifying seven critical success factors particularly for construction projects. Besides Ashley & Jaselskis's critical success factors, different studies conducted by Nguyen et al (2004), Sanvido et al (1992), Chua et al (1999), Gudienė, Banaitis, Banaitienė, and Lopes (2013) and Cooper et al (2001) are alsoavailable. However, no single study is available which is conducted on investigating the role of critical success factors on project success from Ethiopian companies' perspective.

This study is conducted with the intent of narrowing down this unavailability of empirical study on the study area from Ethiopian real estate development construction projects perspective. The study has made an assessment on real estate construction projects to identify critical success factors and to understand the extent of the relationship between the critical success factors and project management success.

The study is conducted in search of answers for the following basic research questions:

1. How successful real estate development construction projects' management are?
2. What are the major critical success factors for real estate development construction projects management?
3. What is the impact of critical success factors in real estate construction projects' management success?

1.3. Study Objectives

1.3.1. General Objective

In general, the study's objective is to determine critical success factors for real estate development construction projects and measure the impact of the success factors on real estate development project management success.

1.3.2. Specific Objectives

The study was conducted with the intent of meeting the following specific objectives:

- ✓ To investigate the major critical success factors for real estate construction projects management.
- ✓ To measure the success level of real estate development construction projects management.
- ✓ To determine the relationship between critical success factors and real estate development construction projects management success.
- ✓ To investigate the impact of success factors on real estate construction projects' management success.

1.4. Scope and Limitation of the Study

1.4.1. Scope of the Study

Conducting a nationwide industry survey requires greater resources of all kind which are currently beyond the capacity of the student researcher. Due to this, the study is delimited in 26 real estate companies located and dominantly operate in Addis Ababa city which at least completed and transferred one round of real estate developments to customers. From the two theories of success in projects (project success and project management success), project management success is the one that is emphasized on throughout the study. The study has focused on investigating the critical success factors for the real estate construction projects and how they influence the projects' success. Ashley & Jaselskis's seven critical success factors and project management's 'iron-triangle' (time, cost and quality) success criteria are adopted in the study.

1.4.2. Limitation of the Study

The student researchers has faced some limitations in the process of conducting this study. Some of the major limitations of the study were inadequate time and material resources which forced the student researcher to limit the investigation on real estate developers only who are dominantly operating in Addis Ababa city. The study is also limited on the views of project managers' without examining the projects. Unwillingness of some real estate developers and project managers to provide necessary data and fill out questionnaires were also limitations for the study.

1.5. Significance of the Study

Though this study is conducted primarily with the intent of fulfilling the requirements of completing a study on Masters of Business Administration with Project Management specialization, it could benefit different parties via looking for answers for several questions. Most importantly, the study will narrow down the study gap observed in the study area from Ethiopian construction projects perspective.

The study will enable real estate owners and construction project managers to focus on factors which critically determine the success probabilities of their projects. The study also lays the foundation for further studies to be conducted in the study area and to provide valuable contributions to increase the likelihood of project management success in the construction sector.

CHAPTER TWO

LITERATURE REVIEW

This second chapter is dedicated to identify study gaps, to prepare a theoretical buildup for the study and familiarize readers with the study area study area. Different studies and literatures of researchers and authors are summarized and presented in four major parts in a way that supports the study.

2.1. Conceptual Literature

2.1.1. Project and Project Management

In the past few decades, the attention given to project and project management studies is improving. Following to this, the understanding on the area is evolving and indicating improvements. In the past, several authors and researchers have been studying projects and project management and have been providing definition for the two on their own perspectives.

Several authors like Olsen (1971) for a long time used to consider projects as unique tasks until a new perspective was introduced by Lundin and Söderholm (1995) that projects are temporary organizations. Additional perspective of viewing projects were also developed by Cleland (1994) claiming that projects are building blocks of strategic implementation in a way that projects create the beneficial changes needed for organizations. These perspectives shaped how projects are viewed in these days which is: projects are unique tasks, temporary organizations and strategic building blocks at the same time.

Recently, project is defined as ‘a one-time, complex and unique set of activities carried out in a project organization with time and budget constraints and they have a predefined project result to be implemented’ Görög (2013). The Project Management Institute (2000), define a project as a temporary, definitive beginning and definitive end, endeavor undertaken to create a unique product or service. Projects can be considered as the achievement of a specific objective and involve the utilization of resources on a series of activities or tasks.

A project is a group of tasks, performed in a definable time period, in order to meet a specific set of objectives. Projects are expressed with characters such as likelihood of being a one-time program, having a life cycle with a specific start and end date, budget and resources. It may require the establishment of a special organization or the crossing of traditional organizational boundaries (Harvey, 1999). Akarakiri (2007) defines project as any scheme, or part of a scheme for investing recourse which can reasonably be analyzed and evaluated as independent unit.

Spinner (1997) defines project as series of task or activities that have several distinguishing characteristics. Such as: Having specific starting and ending data, Achieving a specified result on product, Well defined objectives, A unique, non-repetitive endeavor. This view point is collaborated by Verna (1995) when he defines project as the investment of capital in a time bound intervention to create assets. In the same way, Kerzner (2003) further define project as an assignment that has to be undertaken and completed within a set time, budget, resources and performance specification designed to meet the needs of stakeholders and beneficiaries.

Although, there are numbers of general definition of the term project; it must be recognized at the outset that projects are distinct from other organizational processes. As a rule, a process refers to ongoing, day-to-day activities in which an organization engages, while producing goods and services, processes use existing systems properties and capabilities in a continuous, fairly repetitive manner. Projects, on the other hand, take place outside the normal, process oriented world of the firm. Yet, in some organizations, such as construction, day-to-day processes center on the creation and development of project.

Nevertheless, for the majority of organizations project management activities remain unique and separate from the manner in which more routine, process driven work is performed (Kerzner, 2003). Project work is continuously evolving, established its own work rules, and is the antithesis of repetition in the work place. As a result, it represents an exciting alternative to business as usual for many companies.

Probably the simplest definition is found in the Project Management Body of Knowledge (PMBOK) guide of the Project Management Institute (PMI). PMI is the world's largest professional project management association, with over 200,000 members' worldwide as

of 2005. In their PMBOK guide, a project is defined as “a temporary endeavor undertaken to create a unique product or service”.

PMI (2005) examined the various elements of projects as identified by the following set of definitions:

 Projects are complex, one time processes- A project arises for a specific purpose or to meet a stated goal. They are complex because they typically require the co-ordinate inputs of numerous members of the organization, project members may be from different departments or other organizational unit or from one functional area. On the other hand, some projects such as new product introductions, work best with representatives from many functions, including marketing, engineering, production and design. Because a project is intended to fulfill a stated goal, it is temporary. It exists only until its goal has been met, and at that point, it is dissolved.

 Projects are limited by budget, schedule and resources. Project work requires that members work with limited financial and human resources for a specified time period. They do not run indefinitely. Once the assignment is completed, the project team disbands. Until those points, all its activities are constrained by limitations on budget and personnel availability. Projects are “resource constrained” activities.

 Projects are developed to resolve a clear goal or set goals. There is no such thing as a project team with an on-going, nonspecific purpose. Its goals, or deliverables, define the nature of the project and that is its team. Projects are designed to yield a tangible result, either as a new product or service. Whether the goal is to build a new bridge, implement a new account receivable system or win a presidential election, the goal must be specific and the project organized to achieve a stated aim.

 Projects are customer focused: Whether the project is responding to the needs of an internal organizational unit (e.g. accounting) or intended to exploit a market opportunity external to the organization the underlying purpose of any project is to satisfy customer needs. In the past, this goal was sometimes overlooked. Projects were considered successful if they attained technical, budgetary or scheduling goals. More and more, however, companies have realized that the primary goal of a project is customer satisfaction. If that

goal is neglected, a firm runs the risk of "doing the wrong things well" pursuing projects that may be done efficiently but ignore customer needs or fail commercially.

2.1.2. Project Management

In order to distinguish between the project and project management it is necessary to develop distinct definitions for the two terms. A project can be considered to be the achievement of a specific objective, which involves a series of activities and tasks which consume resources. It has to be completed within a set specification, having definite start and end dates.

In contrast, project management can be defined as the process of controlling the achievement of the project objectives. Utilizing the existing organizational structures and resources, it seeks to manage the project by applying a collection of tools and techniques, without adversely disturbing the routine operation of the company (See, for example, Kerzner, 2003). The function of project management includes defining the requirement of work, establishing the extent of work, allocating the resources required, planning the execution of the work, monitoring the progress of the work and adjusting deviations from the plan.

Initially these two definitions may appear to overlap. Both are heavily orientated to the achievement of the project. The important distinction lies in the emphasis of both definitions. The project is concerned with defining and selecting a task which will be of overall benefit to the company.

The role of project manager has developed in accordance with the understanding of concept of project success (Görög 2002; 2013). Earlier, when projects were defined as unique tasks, project managers were supposed to focus on the process of the project, thus managing the implementation process considering the project results, and the time and cost constraints. As the understanding of the concept of a project widened, the role of the project manager also advanced. The management of stakeholders and the delivery of the beneficial change became part of his/her role. These days the most important roles are as follows: planning the projects, implementing the plan, managing stakeholders and delivering the beneficial change (see e.g. Fekete – Dobreff 2003; Project Management Association 2006). Thus project management can be considered as an application of knowledge, skills, tools, and

techniques to project activities to meet the project requirements (Project Management Association 2006: 24).

2.1.3. Success in Projects

Success is an interesting word and a word that is so general and wide in nature that it is difficult to define and obtain mutual agreement when asked from different individual. Judgev and Muller (2005) in their article mentioned that in order to define what success means in the project context is like gaining consensus from a group of people on the definition of "good art." There is wide divergence of opinions in this field; the only agreement seems to be the disagreement on what constitutes 'project success'. (Murphy, Baker & Fisher, 1974; Pinto & Slevin 1988; Gemuenden & Lechler, 1997 and Shenhar, Levy, and Dvir 1997).

Project success is a topic that is frequently discussed and yet rarely agreed upon (Baccarini, 1999: p. 26). Based on a current study conducted by Crawford, Pollack and England (2006) to uncover the journal emphases over the last 10 years in the field of project management, it is found that the study of project evaluation and improvement has gained increase significance. This implies that more studies have been directed to the area of project management and project success. Generally, the views on project success have evolved over the years from simple definitions that were limited to the implementation phase of the project life cycle to definitions that reflect an appreciation of success over the entire project and product life cycle (Judgev & Muller, 2005).

De Wit (1988) and other writers distinguish between project success (measured against the overall objectives of the project) and project management success (measured against the widespread and traditional measures of performance against cost, time and quality). This is further illustrated in the diagram below which indicates here projects and project managements are to be considered as successful.

Figure 2.1: Layers in project success

Adopted from International Project Leadership academy.

2.1.4. Project Success and Project Management Success

Apparently determining whether a project is a success or a failure is far more complex. There can be ambiguity in determining and measuring the success or failure of a project. Delays in completion of projects are common but they could still be considered successful. De Wit (1988) was among the first to recognize that there is a difference between project success and project management success and that a distraction is needed between them. The importance of this is that successful project management will contribute to the achievement of a project but project management will not stop a project deliverable from failing to succeed. Baccarini (1999) also points out that project management literature often confusingly intertwine two separate dimensions of project success – Product success and project management success.

Project management success focuses on fulfilling the cost, time and quality criteria. On the other hand, Project success deals with the effects of the project's final deliverable, namely project goals, project purpose and satisfaction of stakeholders. There is also a scenario where a project that is perceived as successful by the project manager and team members might be perceived as a failure by the client or market.

Project success can mean different things to different people because of varying perceptions and point of view. This can lead to a disagreement about the success of a project (Liu & Walker, 1998). The perception of the overall project is likely to be different between users and stakeholders and thus also is the project success.

Shenhar et al. (2002) suggest three reasons for this difference in perception. First of all this is due to the universalistic approach used in most project management studies that all projects are assumed to be similar, secondly the subjective nature of the success or weakly defined success measures and at last the limited number of managerial variables examined by previous research.

According to Munns & Bjeirmi (1996) this difference in perception will continue to exist if a distinction between project success and project management success is not established. Project management success is oriented towards planning and control in the context of the short-term life of the project development and delivery but project success tends to be long-term in nature and stretches with the objective or product, the project delivers. The project management success focuses on the values of the Iron Triangle and also on the way in which a project is managed, that is the "quality of the management process". This forms one part of project success defined to preparation and execution phases in the project life cycle. The other part of project success relates to the effects of the project's deliverable or service and is referred to as "product success" (Baccarini, 1999).

Therefore a project can be viewed as being successful despite the Iron Triangle criteria not being met. Munns & Bjerimi (1996) agree on this and illustrate this distinction in their paper as follows.

The project management team is focused on the task of successfully reaching the end of project implementation phase, at which point the project team will terminate its involvement whereas the client is interested in all the phases. The scope of the *project management success* spans phases Conception to Implementation where the scope of the *project success* spans all the phases (Munns & Bjerimi 1996).

Distinction between project management success and project success is not just a debate about terminology. Determining how success is to be defined for a project is a necessary

precursor to the establishment of appropriate methods for managing the project life cycle and for the selection of suitable measurement techniques, Bryde (2005).

Finally, defining success is also a key step in understanding the important "success factors", that is, the inputs to the project management system that have an influence on the outcome (Cooke-Davies, 2002). He also defines project management success and project success as follows

- ***Project management success***, being measured against the traditional gauges of performance (i.e., time, cost and quality/performance).
- ***Project success***, being measured against the overall objectives of the project.

According to PMBOK the project life cycle is made up of three main phases; *Initial/Implementation*, *Intermediate/Execution* and *Final/Handover*. The literature mainly focused on the implementation or execution phases where the attention was on the Iron Triangle (Lim & Mohamed, 1999). This was understandable as the implementation phase was typically the longest and consumed the most resources (PMI, 2000).

2.1.5. Project Management in Construction Projects

According to PMI (2004) – A guide to the Project Management Body of Knowledge (PMBOK Guide), the definition of a project is: A temporary endeavor undertaken to create a unique product, service or result. Though there are process based activities in the construction industry, for instance regarding manufacturing of building materials, from a contractor or a property developer perspective most of the activities in the construction industry are project based. Also when considering different initiatives to industrialize the construction process the recent years it is fair to say that a major part of the money spent in the construction sector is invested in project activities. Considering this, it is crucial for the participants in the construction industry to be experts in management, monitoring and control of projects, thus find the formula for successful projects. Major parts of a recipe for successful projects ought to be generic for all kind of projects, but it is reasonable to believe that some other features are more specific to the construction industry, to certain types of projects, to the project size and to other characteristics of a project.

Jaafari (2001), argue complexity is one distinctive characteristic of many projects to manage to enable successful projects. The complexity in construction projects is mentioned

by Tah and Carr (2000), and Chan and Scott and Chan (2004). Complexity in terms of turbulent environment in large scale engineering projects is emphasized by Floricel and Miller (2001).

2.1.6. Real Estate

Modern definitions focus on the fact that a real estate refers to the land and fixtures together, as distinguished from real property, referring to ownership rights of the land itself. A contemporary definition of real estate is provided by investors: Real estate is a term that encompasses land along with anything permanently affixed to the land, such as buildings, specifically property that is stationary or fixed in location.

Thomsett (1994, P.6), defined real estate as land and all permanent improvements on it, including building. According to Geissler (2008) the term is artificially delineated space referenced to a fixed point on the surface of the earth with a fourth dimension of time. It is built to house an economic activity that is subject to cultural preferences and restricted by the public infrastructure.

Real estate includes entities such as residential homes, raw land, and a variety of forms of income property, including warehouses, office and apartment buildings, and condominiums.

Considering the similarity, all the authors define real estate as land that is identifiable and tangible. They further included all fixtures, improvements and buildings that are permanent to the land are to be considered as real estate.

2.2. Theoretical Literature

2.2.1. Project Success Factors

Rubin & Seeling (1976) first introduce the concept of project success factors in 1976. Rockart (1982) first uses the terminology critical success factors (CSFs) and defines it as those few key factors absolutely necessary to reach goals. McCabe (2001) highlights CSFs are vital for managers to improve their organization in the sense that it will indicate the progress is being made in particular areas.

Success factors can be perceived as main variables that contribute to projects' success (Dvir, 1998), as levers that can be operated by project managers to increase chances of

obtaining the desired outcomes (Westerveld, 2003). A combination of factors determine the success or failure of a project and influencing these factors at the right time makes success more probable (Savolainen, 2012).

In earlier project management literatures, the main focus was on identifying generic factors that contribute to projects' success. Within the last years, authors emphasized on the existence of different success factors depending on project type. The struggle to identify the critical success factors is an ongoing topic, approached by many researchers especially due to the pressure of implementing successful projects in a dynamic global market and ever changing business world (Crisan, Borza, 2014), where continuous innovation is a must in order to achieve competitive advantage (Salanta, Popa, 2014).

Davis (2014) studies project management success in literature from 1970s to present, classifying the evolution of success factors into decades. According to this study, approaches of success factors evolved from focusing on the operation level of a project in 1970s to embracing a stakeholder focused approached after 2000s (Davis, 2014). As a result of the numerous studies that approached the topic of project success, several lists of success factors exist.

Pinto and Slevin's paper from 1987 represents a reference point by establishing a list of ten success factors, recognized by other authors as accurate (Turner, Müller, 2005): project mission, top management support, schedule and plans, client consultation, personnel, technical tasks, client acceptance, monitoring and feedback, communication, trouble-shooting (Pinto, Slevin, 1987). Davis (2014) adopted in her paper a set of nine themes in order to describe success factors of projects: cooperation and communication, timing, identifying/ agreeing objectives, stakeholder satisfaction, acceptance and use of final products, cost/ budget aspects, competencies of the project manager, strategic benefits of the project and top management support.

Clear goals/objectives, top management support Scheduling, Sufficient resources, Planning and control, Monitoring and feedback and Client consultation are critical success factors identified by Belassi and Tukel (1996). These critical success factors were in general supported by authors like Cooke-Davies (2002), and White and Fortune (2002), Westerveld (2003) with slight adjustments on the variables and including risk management as an

additional success criteria. The critical success factor of the authors is summarized and presented in the table below.

Table 2.1: *Summary of Critical Success Factors*

Pinto and Slevin' (1987)	Belassi and Tukel (1996	Cooke-Davies (2002)	White and Fortune (2002)	Westerveld (2003)
Project mission	Clear goals/objectives	Risk management	Clear goals/objectives	Leadership and team
Top management support	Top management support	Responsibilities plan	Realistic schedule	Policy and strategy
Project schedule/plans	Scheduling	Scope change control process	Top management support	Resources
Client consultation	Sufficient resources	Line of sight feedback	Adequate resources	Stakeholder management
Personnel	Planning and control	Learning from experience	Effective risk management	Schedule
Technical tasks	Monitoring and feedback		Clear communication channels	Risks
Client acceptance	Client consultation			
Monitoring and feedback				
Communication				
Trouble shooting				

Yu et al. (2005) discussed the timing of project evaluations which aim analyzing the success, concluding that the process is useful at any time between the first milestones until the completion of the project. Whenever these situations occur, project managers should act in order to increase success chances by influencing the previously identified success factors.

2.2.2. Success Factors for Construction Projects

A building project is completed through a combination of many events and interactions, planned or unplanned, over the life of a facility, with changing participants and processes in a constantly changing environment. Certain factors are more critical to a project's success than others. These factors are called critical project success factors. The term Critical Success Factors in the context of the management of projects was first used by Rockart in 1982 and is defined as those factors predicting success on projects.

Success is defined by Ashley et, al. (1987, p 71) as "results much better than expected or normally observed in terms of cost, schedule, quality, safety and participant satisfaction". The investigation of the success factors of construction projects has attracted the interest of many researchers and many studies have been conducted, with the aim of providing contract parties with valuable insight into how to consistently achieve superior results for their projects. Although construction projects are by their nature repetitive activities, each one has its own characteristics and circumstances. The following section investigates studies that identify critical success factors leading to successful completion of projects on time, within a planned budget, in the safest manner, and with the highest quality. These studies differ in the way they approach the problem and in the way the researchers evaluate success factors.

Sanvido et al (1992) defined the success of construction projects as the degree to which project goals and expectations are met. These goals and expectations may include technical, financial, educational, social, and professional aspects. The study by Sanvido et al (1992) covered all the project phases, including design, construction and maintenance.

Sanvido et al (1992) determined the existence of a set of critical project success factors that play an important role in the planning, design, and construction of successful building projects. Parfitt and Sanvido (1993) used those success factors to develop a checklist that could be used by building professionals to predict the success of a project. An example of this checklist is:

Facility team:

- ⇨ Have adequate steps been taken to assemble and build a facility team with the common goals and chemistry appropriate for this project?
- ⇨ Is a sense of respect for the role and services of each team member evident?
- ⇨ Is there an open and honest communication flow?
- ⇨ Do all team members share a compatible philosophy with the owner of this project?

Chua et al (1999) identified critical success for construction projects based on the accumulated knowledge and judgment of experts in the industry. Sixty-seven success-related factors were considered and grouped under four main project aspects: project characteristic, contractual arrangements, project participants, and interactive process.

Cooper et al (2001) reviewed literature identifying success factors on generic projects and construction projects (Avots, 1969; Baker et.al. 1988; Barnes and Wearne, 1993; Beale and Freeman, 1991; Bedelian, 1996; Bentley and Raftery, 1992; Cash and Fox, 1992; Chan, 1992; Chua et.al.,1997; Clarke,1999; CRT, 1995; Graham, 1988; Hensey, 1991; Hughes, 1986; Kothari, 1986; Pinto and Slevin, 1987; Pinto and Slevin, 1988). The research identified several success factors for the construction process such as clarity/ definition of project objective, scope of project, project manager, project team commitment, capability, cooperation, planning, control, appropriate size of work package, communication and information management, top management support, environment, and health and safety.

Ashley et al. (1987) offer insight into factors that influence construction project effectiveness through interviews with construction project personnel and a literature review of relevant studies. Researchers started with a list of approximately 2000 success factors from previous studies and construction management personnel interviews, which they reduced to 46 success factors grouped into 5 major categories, as follows:

i. Management, organization, and communication

ii. Scope and planning

iii. Controls

iv. Environmental, economic, political, and social

v. Technical

Ashley (1987) made the success factors for each to objectively be rated by several construction project personnel to identify which of these factors had the most significant influence on construction project success. Each factor was subjectively rated using a range from no influence at all to major influence. From these ratings the top 15 factors were grouped by their respective categories. From this list, 11 factors were chosen for further analysis. These are planning effort, project manager goal commitment, project team motivation and goal orientation, scope and work definition, project manager capability and experience, safety, control systems, design interface management, risk identification and management, technical uncertainty, and legal political environment.

After extending the study on eight construction companies, the researcher could find the first seven of the eleven success factor are the most critical for construction projects' success.

A final analysis of the correlation between particular factors and their influence on the success of a construction project was conducted. Results showed that differences in construction and design planning efforts best explained the delineation between average and outstanding projects.

Interpretation of the results further showed that the following factors are most significant in determining project success:

1. Construction and design planning effort
2. Scope and work definition
3. Project manager goal commitment
4. Project team motivation goal orientation
5. Project manager capabilities and experience
6. Safety
7. Control systems

Most of the critical success factors identified are human-related factors. This is supported by Nguyen et al (2004) on the study on project success factors in large construction projects

in Vietnam. Among 20 success factors researched, 5 critical success factors were identified. These were:

1. Competent project manager
2. Adequate funding until project completion
3. Multidisciplinary/competent project team
4. Commitment to project
5. Availability of resources.

2.2.3. Project Success Criteria

Success criteria are defined by Muller and Turner (2007) as variables that measure project success. Relevant success criteria have to be identified and then, success factors should be determined in order to increase the chances of project success (Müller, Turner, 2007).

Many different approaches of measuring project success can be used. One of the most traditional ones is the iron triangle approach. It affirms that, three main aspects that must be managed together characterize projects: scope, cost and time.

PMI (2013. p. 105) defines the scope as "the work performed to deliver a product, service, or result with the specified features and functions". Approaches cost management as: "the cost of resources needed to complete project activities. …the effect of project decisions on the subsequent recurring cost of using, maintaining, and supporting the product, service, or result of the project" PMI (2013. p. 195), and finally time management as "the processes required to manage the timely completion of the project" PMI (2013. p. 141).

After projects are planned, while they are being developed through time, these three concepts may be monitored. They can show the manager and the project's team the level of adherence of the project to its iron triangle.

This traditional approach is mentioned by Carvalho & Rabechini (2011), and PMI (2013). Kerzner (2011) also mentioned it, but with an addition: client's expectation attendance. Kerzner highlight his addition mentioning that it makes sense to any kind of client, being it internal or external.

Lim & Mohammad (1999) disperse success criteria into micro viewpoint completion (e.g. time, cost, quality, performance and safety) and macro viewpoint completion (e.g. time,

satisfaction, utility, and operation). In the same vein, Chan & Chan (2004) and Crawford & Pollack (2004) group construction project success criteria into objective measures (e.g. time, cost, safety and environment) and subjective measures (e.g. quality, functionality and satisfaction of different project participants). Furthermore, Blindenbach-Driessen (2006) suggests a model that consists of project success (e.g. adherence to quality target, schedule, budget, and captured knowledge) and market success (e.g. profitability, revenue, market share, reputation competitive advantage and customer satisfaction). Al-Tmeemy et al. (2011) further combine project success, market success and product success to form future criteria for assessing success of building projects in Malaysia as portrayed in Figure 1. These researches ponder quantitative measures and qualitative measures. Since standard framework has yet to be documented, two groups of protagonists consequently exist. The first group has been prone to qualitative measurement (Munns & Bjeirmi, 1996) because of the admiration to crisp value concept. Contrarily, the other group fancies quantitative measure. The debate seems no end simply because researches into success criteria tends to make assumption at first place, ceteris paribus, where the outcome only affected by criteria perceived to be prominent.

Given the widely accepted ambiguous, assessing success criteria based on project stages has emerged. Assessing project success is made on the altar of delivery stage and post-delivery stage (Atkinson, 1999). The delivery stage is adherence to cost, time, quality, and efficiency. Meanwhile, there are benefits to stakeholders, criteria from project manager, top management, resultant system, impact on customer and business success found in post-delivery stage. In the same vein, the project lifecycle of international development project are divided into five stages namely conceptualising, planning, implementing, closing, and overall project success (Do & Tun, 2008).

The authors further assign different success criteria to the project lifecycle stages. Chan, Scott & Lam (2002) further divide the success criteria into objective and subjective measure under project lifecycles namely pre-construction stage, construction stage, and post-construction stage respectively. Similar to this avenue, Shenhar & Renier, (1996) focus on success category namely internal project objectives, benefit to customer, direct contribution and future opportunity which resemble pre-completion, short term, medium term and long term respectively. The authors are pioneer in typologizing project success criteria. The basic

assumption behind the scene is success varies with time. The research seems to be the robust as it takes into consideration the project success and project management success components as well. Additionally, Shenhar, Dvir, Levy & Maltz (2001) claim that project success represents strategic management concept as all efforts must be in accordance with the strategic long-term goals of the organization. However, concerns are raised over the project classification across industry.

Given the character of success criteria is inherently multidimensional, Shenhar et al. (1997) suggest four dimensions of project success criteria namely project efficiency, impact on customer, business success, and preparing for the future. At the meantime, Sadeh, Dvir & Shenhar (2000) divide success dimension into meeting design goals, benefits to the end user, benefits to the developing organisation, and benefit to the defence and national infrastructure. In addition, Diallo & Thuillier (2004) posit three empirical macro dimensions namely management success, project itself and profile of international development project. These researches, however, tend to create simplicity out of the knowledge itself. This is the prevailing assumption concerning the validation process of exhaustive data. Moreover, the practically impact remains a doubt. It seems paradoxical, but that is the imperfection of the knowledge unless a robust validation method comes in sight.

Lastly, prevailing trend is noted in studying the project success criteria based on individually stakeholder's perspective. As the project success could be assessed by different stakeholders namely clients, managers, contractors, workers, and end-user, the relevant criteria, therefore, must represent different views (Stuckenbruck, 1986). Bryde & Robinson (2005) show that client puts more emphasis on the need of other stakeholders whilst contractor puts more emphasis on project cost and duration. Being the main person in any project, the perspective of client has drawn more attention compared to other stakeholders. For example, Frodell (2008) depicts an empirical result that shows success measures like keeping project on time, within budget, maintenance costs and project goals as well as ensuring profitability are important criteria. At the meantime, Ellatar (2009) suggests a trilogy perspective framework on construction project. As suggested, client's perspective (e.g. time, cost, functionality, end result, quality, aesthetic value, profitability, marketability, less aggravation), designer's perspective (e.g. satisfied client, quality, cost

and profit, professional related issues like staff fulfilment, marketable product, less construction problem, no liability, socially accepted, client pays and well defined scope of work) and contractor's perspective (e.g. time, cost, quality, free from claims, clearly defined expectation from all parties, client satisfaction, as well as less surprises during project) are prominent to increase the likelihood of project success. Generally, the perspective research has several limitations: first, it concerns about individually stakeholder's viewpoint and overlooks the interrelationship among stakeholders. Second, no universal accepted methods for measuring subjective measures and it only exacerbates the problem by putting objective and subjective measures together. Third and lastly, should it be more contexts specific to incorporate the type of project, procurement method, and within different country remains vague.

2.2.4. Success Criteria for Construction Projects

Key Performance Indicators (KPIs) may be used to monitor performance and measure how successful certain projects are. This topic has described by for instance Chan and Chan (2004), and they state that it is essential to define what project success means, or it will not be feasible to discuss performance measurement. Further, they conclude that both qualitative and quantitative KPIs are desirable. A set of methods on how to measure the performance is presented by Salminen (2005), and that the criteria cost, schedule deviation, quality and safety form a coherent description of construction project success. Often failure in one aspect indicates failure in more of the aspects, though this dependency is not necessary.

Most authors such as Al-Tmeemy et al. (2011); Atkinson (1999); Baccarini (1999); Belassi & Tukel (1996); Hatush & Skitmore (1997); Lim and Mohammad (1999) and Navarre & Schaan (1990), regardless of time space, have postulated time, cost, and quality as a basic foundation in assessing the project success. Construction industry is a case in point given the trilogy will culminate in profit related concerns. However, questions and concerns are raised about the insufficiency in this trilogy per se as success criteria. Baccarini, (1999) suggests product success, which consists of owner's strategy, user satisfaction, profitability, and market share together with project management success, which resembles the time, cost, quality, project management process and stakeholders' satisfaction as components that form project success concept.

Likewise the seven critical success factors, Ashley et al. (1987) also suggested six criteria by which success of construction projects should be measured against. The criteria were comparatively rated for average and outstanding projects, revealing that the most important criteria for gauging the success of a construction project were:

1. Budget
2. Schedule
3. Client satisfaction
4. Functionality
5. Project manager / team satisfaction
6. Contractor satisfaction

Furthermore, the three researchers (Ashley, Nguyen & Sanvido) held similar viewpoints; for example, all agreed that the financial reality of doing business and achieving an appropriate schedule was a means of measuring the success of a project. On the other hand, there were some unique criteria. For example, the designer was looking for a project that would increase the level of professional satisfaction among their employees.

2.3. Empirical Review

Different researchers in different countries investigated project success factors and success criteria from different industries perspectives. In this sub section, the methodology used and findings identified on studies conducted on project success, success factors and success criteria are reviewed.

Alan Murphy and Ann Ledwith (2007) investigated which critical success factors contribute for project success on high technology small and micro enterprises. The authors selected six critical factor what they have considered to have potentially highly influential critical success factors and conducted a survey on 200 high technology SMEs. Clear goals/objectives, senior management support, resource allocation, planning, monitoring and control, Client consultation and risk management are the selected critical success factors. Their finding indicates that the existence of a project manager and the use of project planning significantly contribute to project success. Control for projects resides primarily

with owner managers and achieving quality standards is a significant success criterion. Additionally, having clear goals/objectives and top management support are identified as the most important success factors in the firms surveyed.

Lonna, Emil and Razvan (2012) on their quest investigated the main factors influencing project success through conducting a quantitative research method. They adopted Pinto and Slevin's critical success factors and tried to identify the top five project success influencing factors. The authors confirmed all the critical factors are important for project success yet they argue the top five influencing factors are clearly defined goal and directions, competent project team members, clearly defined roles and responsibilities, communication and consultation with stakeholders and compliance with the planned budget, time frame and performance criteria.

Alias, Zawawi, Yusof, and Aris (2014) have conducted a study to identify the relationship between critical success factors of project and project performance. The authors building their theoretical framework on five critical success factors as variables and investigated their influence on project performance using cost, time, quality and client satisfaction as performance measures. Project management action, project procedures, human factors, external issues and project related factors are the success criteria used as variables in the study. At the completion of the study, the authors proved there is a positive relationship between project performance and all the five critical success factors.

Chan Wai Kuen (2007) developed conceptual framework and tasted it in Malysia manufacturing sector. Chan's focus was identifying success measures of projects and contributing factors for manufacturing related projects. Chan adopted Pinto's critical success factors and the traditional time, cost and quality measure of project success in his study and investigated the relationship existed between the two. Based on his finding, Chan argue that all the critical success factors identified by Pinto and Slevin to be influential factors for project success in Malaysia manufacturing industry.

The studies conducted by Ashley et al. (1987), Nguyen et al (2004), Sanvido et al (1992), Chua et al (1999), Gudienė, Banaitis, Banaitienė, and Lopes (2013) and Cooper et al (2001) are one step closer to the study conducted by the student researcher from the above

summarized studies. All this studies are conducted on critical success factors for construction projects.

Ashley (1987) started his investigating with 2000 success factors identified by prior researchers. By the interviews he conducted with construction management personals, he narrowed down the success factors to 46. With further investigation, the construction project management personnel rated 15 of the success factors are identified to have greater influence on project success compared to the others. Continuing his investigation, Ashley ultimately found that seven of the factors are critical for construction projects success. The critical success factors identified by Ashley are construction and design planning effort, scope and work definition, project manager goal commitment, project manager capabilities and experience, safety, and control systems.

Nguyen et al (2004) studied project success factors in large construction projects in Vietnam. Nguyen started his investigation with 20 success factors and identified five of critical success factors by the completion of the study. Among the 20 success factors he started his study with, competent project manager, adequate funding until project completion, multidisciplinary/competent project team, commitment to project, and availability of resources are found to be the critical ones. Nguyen's study also grouped the success factors into one of four components which are comfort, competence, commitment and communication. His findings found to be supportive to that of Ashley's study.

Sanvido et al (1992) identified the success criteria list for each of the contract parties: owner, designer, and contractor. Some of the owner success criteria included being on schedule, being on budget, and return on investment. Examples of the designer success criteria were client satisfaction, quality architectural product, well-defined scope, and social acceptability. Finally, contractors' criteria for measuring success included meeting the schedule, profit, being under budget (savings obtained for owner and/or contractor), safety, and client satisfaction.

Chua et al (1999) identified critical success for construction projects based on the accumulated knowledge and judgement of 20 experts in the industry. Sixty-seven success-related factors were considered and grouped under four main project aspects: project characteristic, contractual arrangements, project participants, and interactive process.The

results of the study revealed that experts agree that there are different sets of construction success factors for different objectives. They determined that the probability of project success can be increased if the inherent characteristics of the project are thoroughly understood, appropriate contractual arrangements are adopted, a competent management team is assigned, and a sound monitoring and control system is established.

Gudienė, Banaitis, Banaitienė, and Lopes (2013) used multiple criteria approach taking in to consideration seven groups of factors from different dimensions. A conceptual model that includes the grouped critical success factors affecting project success was developed. According to the authors' findings, the seven major groups of factors, namely external factors, institutional factors, projects related factors, project management/team members related factors, project manager related factors, client related factors and contractor related factors are proved to influence construction project success in Lithuania.

However, as far as the venture of the researcher is concerned, no published study is available that devotes its attention on investigating what factors influence project success or how projects success is to be measured in Ethiopian or Ethiopian companies perspective.

2.4. Synthesis

After an in-depth review of conceptual, theoretical and empirical literatures which provided different potential success criteria and success measures for projects management is conducted in the preceding parts of the chapter. The student researcher has reached up on a conclusion that Ashley's (1987) critical success factors and the 'iron triangle' of project management are the appropriate theories to construct these study up on.

There are number of studies on success factors in the construction industry. Chua et.al (1999), Cooper (2001), Alkathami (2004), and Jha and Lyer (2008) adopted the success factors identified by Ashley et al (1989). It can be seen that critical success factors have been predominantly contributing towards enhancing the performance level and success of projects.

Due to its comprehensive, detailed descriptions, and because much of the other research was based upon it in some way (Chua et.al (1999), Cooper (2001), Alkathami (2004), Jha and Lyer (2008), Nguyen et al (2004), Shamas-ur-Rehmen Toor and Stephen O.Ogunlana (2008), the seven most significant success factors in determining project success identified by Ashley et al. (1987) have been chosen for this study to be independent variables.

The ‘iron triangle’ of project that is time, cost and quality are the adopted success criteria to measure the success level of real estate construction projects and are used as dependent variables.

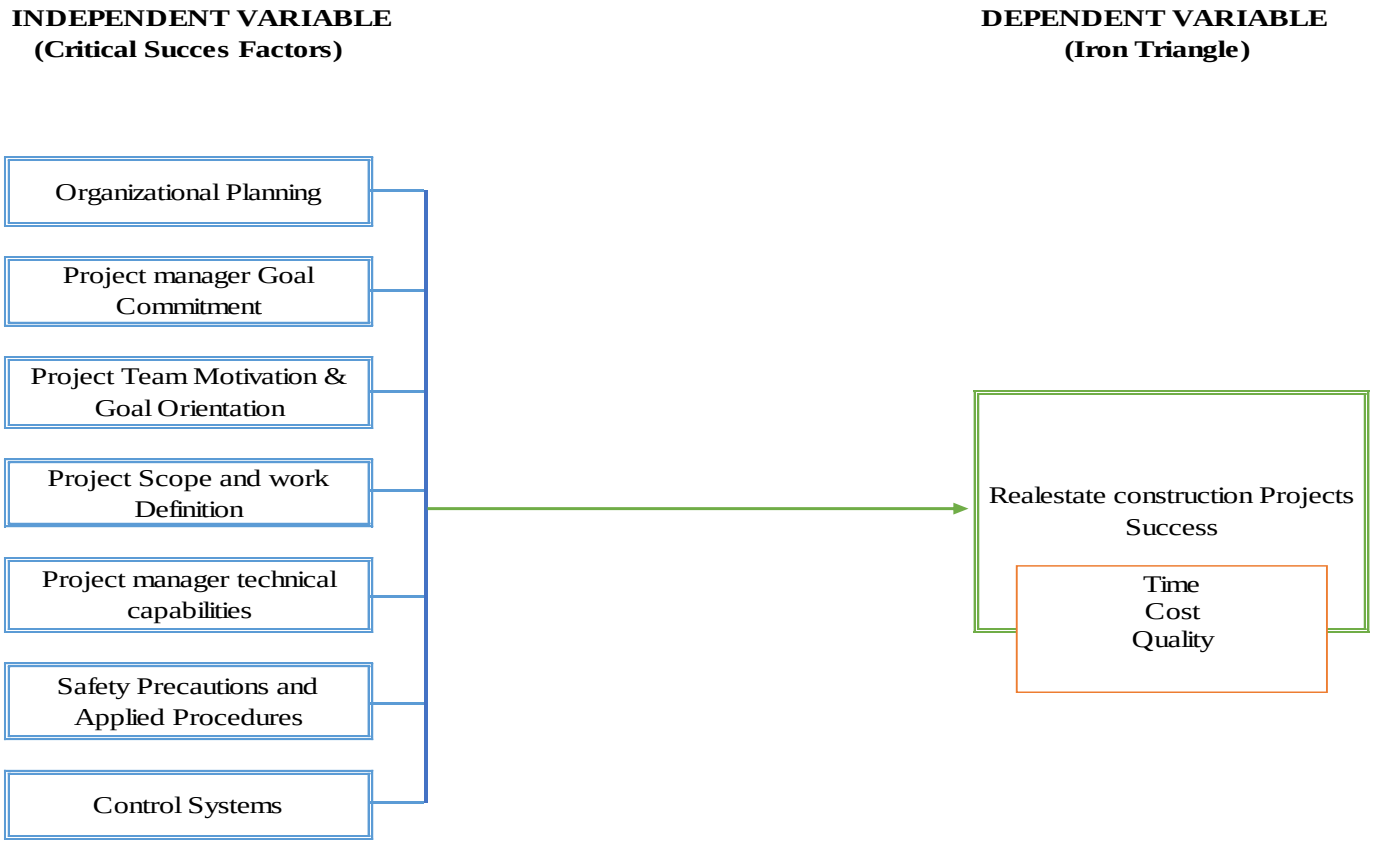

Figure 2.2: Conceptual framework of the study

Adopted from: Ashley & Jaselskis’s (1987) Determinants of project management success for construction projects.

The study dedicated itself in assessing the impact of Ashley’s critical success factors on real estate construction projects.

2.4.1. Working Hypotheses

For the purpose of providing answers for the basic questions, the student researcher adopted Ashley & Jaselskis's (1987) seven critical success factors for construction projects success and developed seven of its working hypotheses. Through proving or disproving the hypotheses, the study has tried to identify the relationship existed between critical success factors and project success in real estate development construction projects.

H1: Organizational planning effort has a significant positive impact on project management success in real estate construction projects.

H2: Project manager goal commitment has a significant positive impact on project management success in real estate construction projects.

H3: Project team motivation and goal orientation has a significant positive impact on project management success in real estate construction projects.

H4: Project scope and work definition has a significant positive impact on project management success in real estate construction projects.

H5: Project managers' capability and experience has a significant positive impact on project management success in real estate construction projects.

H6: Safety precautions and applied procedures has a significant positive impact on project management success in real estate construction projects.

H7: The availability of proper control systems has a significant positive impact on project management success in real estate construction projects.

CHAPTER THREE

RESEARCH METHODOLOGY

In this part of the study the different methods, instruments, and techniques those are employed in the accomplishment of this study are explained. This includes a detail description and justification of the methodological choices made to conduct this study, presents the research design, sampling design and strategy, data collection methods including how they are analyzed, interpreted, and discussed.

3.1. Research Design and Approach

The study intends to assess the impacts of project success factors over project success. Cause and effect (causal) relationship between variables are assessed throughout the study. This makes it appropriate for the study to implement explanatory research design.

Depending on the type of data that are used in the research, two general research approaches are identified, qualitative or quantitative. In this study both types of dada those can and cannot be quantified are used. The quantifiable data are gathered by the closed ended questions of the questionnaire which were designed to keep the respondents in scope. There were also open ended questions, providing unquantifiable data, which were designed to provide respondents with the freedom of expressing what they believe important for the study. This leads for the study to use a mixed research approach which both qualitative and quantitative research methods are applied.

3.2. Study Area and Period

The study is conducted on real estate development companies located in Addis Ababa city focusing on investigating how construction projects are managed, how successful projects are and how the success level is influenced by the project management success factors. The study took place between November 20 and December 11.

3.3. Types and Sources of Data

For the completion of this study, both primary and secondary types of data are used. The primary data for this research is acquired from sample respondent project managers who are selected from the real estate companies.

3.4. Sample Design

In this part, the target population and sample size of the study are discussed including the procedures and techniques used to identify them.

3.4.1. Population

Currently, a total of eighty three (83) real estate companies are operating in Ethiopia. However, as the study is conducted on the real estate developers located in Addis Ababa city, it focuses only on 71 of the total 83. Project managers of 71 real estate developers are considered to be the population of the study.

3.4.2. Target population

A list of all sampling units those are eligible and available for selections at the stage of sampling process were identified and sampling frames were prepared. From the total 71 real estate companies operating in in Addis Ababa city, 45 are decided not to be incorporated in the sample frame as they are yet to complete a single real-estate development project. This is believed by the student researcher that a project manager should at least complete one project to give response about project management success or failure. This brings the total population in to a sampling frame of 26 real estate companies and a total of 118 project managers operating in the real estates. A maximum of 7 and a minimum of 2 project managers operate per a real estate development company.

According to the recommendation of Hosmer and Lemeshow (2000) and Long (1997), the minimum sample size should not be lesser than 10 per independent variable in case of regression analysis and it should not be lesser than 100 in aggregate. The theoretical framework of the study, which is discussed in the preceding chapter, suggests 7 independent variables. This implies that the sample size should not be lesser than 70. Yet, this doesn't meet Hosmer and Lemeshow's other suggestion which required a minimum sample size of 100 to conduct a regression analysis. Taking this in to consideration, the student researcher has decided to employ census survey method and to conduct the study on all the 118 project managers.

3.5. Data Collection Methods

In this study both primary and secondary data are used. Secondary data is collected from books, articles, web sites, and reports. These data are expected to help in introducing the concept of project management and project success; clarifying the theoretical framework designed for the study; and to imply how much is known about the study area and the research gap existed.

Questionnaires (both open and closed ended) are the tools implemented by the student researcher to collect all the necessary primary data. The questionnaire for this study is developed based on Ashley & Jaselskis's (1987) seven critical success factors and the 'iron-triangle' project success measure. The items in the questionnaire were validated and tested for reliability and used after it is assured to meet the requirements in both cases.

Reliability and Validity Tests

Validity is the extent to which the items or questions incorporated in the questionnaire measures what it is supposed to measure and performs as it is designed to perform (Hair et al, 2003). The item in this study's questionnaire are argued to be valid by the student researcher as they are designed according to Ashley's (1987) seven critical success factors for construction projects. Besides Ashley & Jaselskis's critical success factors, different studies conducted by Nguyen et al (2004), Sanvido et al (1992), Chua et al (1999), Gudienė, Banaitis, Banaitienė, and Lopes (2013) and Cooper et al (2001) are also considered bythe student researcher in developing the questionnaire.

Reliability is consistency and reliability test measures whether or not the instrument consistently measure what it is intended to measure. According to George and Mallery (2003), a Cronbach's alpha value higher than 0.7 is considered to be reliable. The reliability gets stronger as it goes higher than 0.7 and poorer as it gets lower than 0.7. While computing alpha values for items incorporated under research variables of this study, all the results except the two are found to be greater than 0.7 meeting the minimum requirement. The two variables which their alpha values are found to be below 0.7 were also not that far (0.67 for OP and 0.62 for PTMGO) from the cut point. This reflects how well the items incorporated under a variable are positively correlated one another.

Table 3.1. *Reliability statistic for variables*

	Variables	Number of Items	Cronbach's Alpha
OP	**Organizational planning**	5	0.662
PMGC	**Project manager goal commitment**	5	0.749
PTMGO	**Project team's motivation and goal orientation**	5	0.620
PSWD	**Clarity of the project's scope and work definition**	5	0.750
PMCE	**Project manager's capabilities and experience**	5	0.720
SPAP	**Safety precautions and applied procedures**	5	0.734
CS	**Use of control systems**	3	0.788

Source: George and Mallery (2003)

3.6. Data Analysis Techniques

As the study type is explanatory, the type of technique preferred for the data analysis is inferential statistics. The relationship between the dependent variable of project success and the independent variables of success factors is measured with the application of logistic regression tests. The type and extent of the relationship between the critical success factors in any one of the success criteria represents the relationship between success criteria and project management success. Statistical Package for Social Science (SPSS) is used to analyze the descriptive and inferential statistics of the study.

3.7. Empirical Models Specification

Once the relationship between a set of variables is hypothesized based on theories, the highly recommended approach to test the hypothesis is through econometric modeling and testing (creel, 2006). To achieve the proposed objectives similar fashion was suggested in this study. Logistic regression analysis is used to estimate the potential determinates of the limited dependent variable that is "project success".

Based on the above theoretical framework, three econometric models are constructed. In the models, it is tried to statistically measure the impact of the independent variables on the

probability of project success. The equations of the models uses the "Project Success" which is explained by Time (T), Cost (C) and Quality (Q) as dependent variable. They also contain the vector of explanatory/independent variables. The equations of the models are given as;

$$\boldsymbol{P(T) = \alpha_0 + \alpha_1 OP + \alpha_2 PMGC + \alpha_3 PTMGO + \alpha_4 PSWD + \alpha_5 PTMTC + \alpha_6 SPAP + \alpha_7 CS + \varepsilon \ldots} \textbf{ (1)}$$

$$\boldsymbol{P(C) = \beta_0 + \beta_1 OP + \beta_2 PMGC + \beta_3 PTMGO + \beta_4 PSWD + \beta_5 PTMTC + \beta_6 SPAP + \beta_7 CS + \varepsilon \ldots} \textbf{ (2)}$$

$$\boldsymbol{P(Q) = \mu_0 + \mu_1 OP + \mu_2 PMGC + \mu_3 PTMGO + \mu_4 PSWD + \mu_5 PTMTC + \mu_6 SPAP + \mu_7 CS + \varepsilon \ldots} \textbf{ (3)}$$

Where: *OP* is Organizational Planning; *PMGC* is Project Manager Goal Commitment; *PTMGO* is Project Team Motivation and Goal Orientation; *PSWD* is Project Scope and Work Definition; *PMTC* is Project Manager Technical Capabilities; *SPAP* is Safety Precautions and Applied Procedures; *CS is* Control Systems; α_i is slope coefficient and ε is error term.

To estimate the above model, logistic regression is used, which enabled to predict a dependent variable, which assumes a limited value from a set of variables that may be continuous, discrete, and dichotomous or a mix of any of these (Kothari, 2004). The logistic regression is used to estimate the variance of dependent variable explained by the independent and to rank the relative importance of independent variables (Mender, 2002).

The logistic regression applies maximum likelihood estimation to estimate the probability of certain event occurring, after transforming dependent variable in to a logit variable that is the natural log of the odd of dependent occurring or not.

Since the model contains dependent variables which possibly assume a binary outcome of "0" or "1", bivariate logistic regression is used to estimate the marginal effect of all independent variables on project completion at the planned time, cost and quality (project success).

CHAPTER FOUR

RESULTS AND DISCUSSION

As explained in the methodology section, the target populations were all real estate construction project managers who have at least completed one project. All the project managers who meet the requirement are 118 in total. As the study implanted census survey method, all were considered respondents for the study and questionnaires' were given for each. From the questionnaires distributed, 105 were properly filled and returned providing a response rate of 90%.

The result of the primary data analysis and interpretation of the findings are presented in this chapter under few separate sections. The demographic profile of the sample, the presence of the seven construction project success factors in the real estate sector and their impact on the success or failure of the construction are discussed thoroughly.

In addition, the result of the binary logistic regression model that estimates the potential factors that influence the successful completion of real estate development construction projects is reported and discussed.

4.1. Descriptive Statistics

Here, the analysis of the collected data is presented in tables followed by interpretations. For the data that are analyzed and presented by median and standard deviation values of the respondents' responses, the standard used as medium is 3.00 as the questionnaire presented in a five level Likert scale. A median response value below 3.00 indicates disagreement, 3.00 neutrality, and above 3.00 agreements to the statement by most of the respondents.

4.1.1. Profile of Respondents

The study respondents were 105 project managers of real estate development construction projects from which 60 (57.1%) are males and 45 (42.9%) are females.

Table 4.1. *Demographic profile of respondents*

Demographic			*Total*
Sex	Male	Count	60
		%	57.1%
	Female	Count	45
		%	42.9%
AGE	Below 25	Count	-
		%	-
	26-35	Count	80
		%	76.2%
	36-40	Count	25
		%	23.8%
	46-65	Count	-
		%	-
Educational Status	Diploma	Count	45
		%	42.9%
	1st degree	Count	60
		%	57.1%
	2nd degree and above	Count	-
		%	-
Experience as project manager	Below 3 Years	Count	-
		%	-
	3-6 Years	Count	60
		%	57.1%
	7-10 Years	Count	30
		%	28.6%
	Above 10 Years	Count	15
		%	14.3%

Source: Respondents

The age wise distribution of the sample is dominated by age range between 26 and 35 years which is 80 (76.2%) out of the total sample size while the remaining 25 (23.8%) respondents are between age groups of 36 to 40.

Educational accomplishment was also one of the respondents profile incorporated in the study which 60 (57.1%) of the respondent project managers are found to be first degree holders. The rest 45 (42.9) respondents are diploma holders.

In terms of respondents' experience, most (60 or 57.1%) have served as project manager between the years 3 to 6. 30 (28.6%) of the respondents have a project management experience between 7 to 10 years while only 15 (14.3%) of the respondents are experienced project management for more than ten years.

4.1.2. Critical Success Factors Ranking

A question was presented for the respondents to indicate and prioritize which factors they consider to be important for successful completion of real estate construction projects among the seven potential success factors. The result indicated that all the presented factors are success factors for real estate development construction projects where some are even critical.

Table 4.2. *Critical success factors rank*

No.	*Items*	*%*	*Count*	*Rank*
1.	Project manager's capabilities and experience	42.90%	45	1
2.	organizational planning (Construction and design planning effort)	28.60%	30	2
3.	project's scope and work definition	9.50%	10	3
4.	Project manager goal commitment	9.50%	10	3
5.	Project team's motivation and goal orientation	4.76%	5	5
6.	control systems	4.76%	5	5
7.	Safety precautions and applied procedures	-	-	7
	TOTAL	100%	105	

Source: Respondents

The capability and experience of project managers is rated as the most important success factor for real estate development construction projects by 45 (42.9%) respondents. Organizational planning is the second most important critical success factor ranked first by 30 (25.6%) respondents. Clearly defined project scope and work definition is agreed to be the first critical factor by 10 (9.5%) of the respondents equally with project managers' goal commitment. Project team's motivation and goal orientation, control systems and safety precautions and applied procedures are ranked from fourth to seventh respectively by the respondents.

4.1.3. Critical Success Factors

In this sub-section, the analysis of questions which are believed to evaluate the presence of critical success factors in the real estate development construction projects were presented. The questions were categorized under Ashley's (1987) seven critical success factors. The data collected for all the seven variables are analyzed separately at first and finally analyzed jointly to implicate which factors are presented and which are not in the selected real estate companies.

1. Organizational Planning

Table 4.3. *Organizational Planning*

	Items	*Median*	*Std. Deviation*
OP1	Adequate consideration and attention is given in designing buildings	4	1.172
OP2	Constructions are thoroughly planned in advance before they are started.	4	1.144
OP3	Resources needed to carry out construction projects are well recognized in advance	4	1.050
OP4	There is a proper estimation of the cost that will be needed to complete the construction.	3	1.279
OP5	Project schedule and construction completion time are well planned	2	1.114
AVOP	**Organizational Planning**	**3.40**	**.69588**

Source: Respondents

The response indicated an average median value of 3.40 indicating majority of the respondents' agreement on the presence of proper planning of construction and design. Though the average median value of the variables is greater than 3.00 indicating the respondents' agreement, the table also indicates a median value of 2.00 on the fifth item. This implies even though majority of the project managers are convinced with the proper implementation of construction planning activities in general terms, they agree that project schedules and completion times are not being estimated properly.

2. Project managers' goal commitment

Five items were presented for the respondent project managers to assess if they are fully committed for the projects' goals. Their response indicates an average median value of 3.2 as presented in the table below indicating their commitment for the project goals they ate managing. They haven't provide this response without reservation though as they believe they haven't felt sure whether or not they are doing enough in initiating project team members towards the attainment project goals, the goals set for projects are attainable and they are doing enough to defend projects from external influences. These are indicated in the table with a median value of 3.0.

Table 4.4. *Project managers' goal commitment*

	Items	***Median***	***Std. Deviation***
PMGC	Project managers are devoted to meet goal of the project they have assigned on.	4	1.102
PMGC	Project managers initiate their team members for successfully completing the project.	3	1.138
PMGC	The goals set for projects are perceived to be attainable by project managers	3	1.004
PMGC	Project managers often evaluate if the project is on the right path to meet its intended goal	4	1.383
PMGC	Project managers resist interferences and influences that might challenge project goal achievement	3	1.004
PMGC	**Project managers' goal commitment**	**3.2**	**.80121**

Source: Respondents

3. Project team's motivation and goal orientation

Motivation and goal oriented-ness of project team members is proven to be one of the critical factors for construction projects success. Hence, project managers have been asked regarding their team members' motivation and goal orientation. Their response is presented in the table below.

Table 4.5. *Project team's motivation and goal orientation*

	Items	***Median***	***Std. Deviation***
PTMGO1	Project team members are motivated enough to turn the project they are assigned on in to a success	1	1.024
PTMGO2	Ideas of how to improve project performance are forwarded by project team members	3	1.130
PTMGO3	The effort of project team members is directed on activities that contribute for the project success.	4	1.174
PTMGO4	Attaining the project goal is the priority for of the project team members	2	1.275
PTMGO5	Project team members accept any assignment as long as it would help for project goal attainment	1	.895
AVPTMGO	**Project team's motivation and goal orientation**	**2.6**	**.63549**

Source: Respondents

The data indicates an average median value of 2.6 which is below 3 designating most of the respondents doesn't agree project team members are not adequately motivated and lack project goal oriented-ness. Specifically, most of the respondent project managers argue that team members lack the motivation to turn the project in to a success, their prior objective is not the successful completion of the project and are not willing assignments that are convenient to them yet have greater importance to the project success. These all are indicated in the first, fourth and fifth row of the table with a median value of 1.0, 2.00 and 1.00 which all are below the average median value 3.00.

However, most of the respondents agree on the project team members' goal directed effort in a manner that contributes for project's successful completion. This is indicated by the median value of 4.00.

4. Project's Scope and Work Definition

Another dimension of construction project management the study has tried to assess is scope and work definition of projects. Respondents were asked regarding their agreement level on the presence of proper defining of project work and scope. The result is presented in the table below.

Table 4.6. *Project's scope and work definition*

	Items	***Median***	***Std. Deviation***
PSWD1	What projects are and aren't about is well clarified	4	1.138
PSWD2	Works to be done in construction projects are listed and defined properly.	4	1.070
PSWD3	Responsibilities of project participant parties are well illustrated.	4	1.264
PSWD4	What major activities need to be done and to what end result does they lead is clearly defined.	4	.829
PSWD5	Criteria to measure whether a project is successful or not is placed in advance.	4	.687
AVPSWD	**Project's scope and work definition**	**3.6**	**.72096**

Source: Respondents

The analyzed response of the project managers indicates the existence of proper scope and work defining practice in the real estate development construction projects. This is indicated by the average median value of 3.6. Most of the respondents agreed up on all of the items presented in under the variable. This is indicated in the table by the median values of 4.0.

5. Project Manager's Capabilities and Experience

Also another critical success factor for construction projects is the capability and experience project managers possess. This is also assured in this study where the respondents were given the chance to rank the critical success factors and most rated project manager's capability and experience as indicated in table 4.2. Here, the respondents were asked if this critical success factor, which they rated as the most critical of all, is existed in the real estate construction projects. The results are presented in the below.

Table 4.7. *Project manager's capabilities and experience*

	Items	***Median***	***Std. Deviation***
PMCE1	Project managers are rich in technical capabilities that are needed to manage the project.	4	1.348
PMCE2	Project managers are rich in managerial capabilities that are needed to manage the project	3	1.070
PMCE3	Alternative direction that leads to project goal achievement is provided by project managers when the first plan fails.	3	1.130
PMCE4	Project managers strongly bargain for the interest of the project not to be affected	3	1.050
PMCE5	Project managers are assigned on projects only when they are believed to possess the required capabilities and experience.	3	.856
AVPMCE	**Project manager's capabilities and experience**	**2.8**	**.75738**

Sources: Respondents

From the five items presented under the variable, most of the respondents neither agree nor disagree on four of them which is indicated by the median values of 3.0. Most of the project

managers agreed that though project managers are rich in technical capabilities yet are not confident in their response in their managerial capability that is needed to successfully manage projects. This is indicated by the median values of 4.0 for technical capability and 3.0 for managerial capabilities.

The data in the table also indicates the project managers' neutrality in providing their response about project managers' bargain to protect the project's interest, producing alternative directions for the successful project completion and assignment as project managers based on their fitness and qualification which all are indicated by median values of 3.0.

In general, the average median value of 2.80 for all the five items under the variable indicates that project managers doesn't fulfil the required capability and experience to proper project management practices.

6. Safety Precautions and Applied Procedures

Table 4.8. *Safety precautions and applied procedures*

	Items	***Median***	***Std. Deviation***
SPAP1	The real estate pays greater attention for the safety of personnel and machineries throughout its operation.	3.00	.885
SPAP2	Trainings on how to keep personnel and machineries from harm is facilitated by the real estate	2.00	1.070
SPAP3	Accidents that could have been prevented if safety procedures are implemented are not observed in the real estate's projects.	3.00	.955
SPAP4	The real estate has a well-designed safety standard.	2.00	.962
SPAP5	The real estate monitors the implementation of its safety standards.	2.00	.908
AVSPAP	**Safety precautions and applied procedures**	**2.60**	**.66671**

Sources: Respondents

Building construction works in nature require physical activity and the operation of several heavy machineries. Safety of equipment's and workers is always in danger and needs to be protected. What is appropriate construction companies such as real estate developers is to develop or adopt a standard safety procedures. Hence, it has also been tried to investigate the safety and risk management procedures of the real estates under study.

Five items those are believed to assess the applied safety procedures of the real estates were presented to the respondents on which they expressed their level of agreement. The analyzed response indicated the existence of poor safety precaution and applied procedures in most of the real estate developers. This is indicated by the below average (2.0 for there of the items) and average (3.0 for two of the items) out of five items under the variable which left the average variable median value at 2.6.

7. Control Systems

Close follow-up and controlling of planned activities is proven to increase the likelihood of successful completion in construction projects. Taking this in to consideration, control systems of construction projects is one dimension of project management that the study intended to assess. Whether or not proper controlling systems are applied in the real estate developers under investigation is tried to be assessed by three items provided to respondents to express their level of agreement on. The results are presented in the table below.

Table 4.9. *Control systems*

	Items	***Median***	***Std. Deviation***
CS1	Control systems to assure projects' timely completion are implemented	3.00	1.095
CS2	Control systems that assure projects' completion within the cost limit are implemented	3.00	1.251
CS3	Control systems that assure projects' completion based on the intended quality level are implemented	4.00	1.008
AVCS	**Control Systems**	**3.33**	**.94113**

Sources: Respondents

For the items presented under the variable, most of respondents indicated their agreement in the existence of controlling systems of project completion on the planned quality standards. The respondents' response indicates neutrality regarding the presence of controlling system for timely and in budget completion of projects. This is indicated in the table with a median value of 3.00. This provides an average variable median of 3.33 indicating proper control systems are in practice in the real estate developing companies.

Summary of Critical Success Factors

From the discussions above, the presence of the critical success factors in the under investigation real estate developing companies have been investigated in detail. This leads up to the understanding that some are existed while some are not. In the table below, the respondents' responses are summarized and presented to identify the critical success factors which are and are not being applied in the real estate developing companies.

Table 4.10. *Summary of critical success factors*

	Items	***Median***	***Std. Deviation***
OP	Organizational planning	3.40	.69588
PMGC	Project manager goal commitment	3.20	.80121
PTMGO	Project team's motivation and goal Orientation	2.60	.63549
PSWD	Project's scope and work definition	3.60	.72096
PMCE	Project manager's capabilities and Experience	2.80	.75738
SPAP	Safety precautions and applied Procedures	2.60	.66671
CS	control systems	3.33	.94113

The results of the analysis leads in to a conclusion that only four out of seven critical success factors are presented in the real estate developing companies of Addis Ababa. Organizational planning with a median value of 3.40, project manager goal commitment with a median value of 3.20, project's scope and work definition with a median value of 3.60 and control systems

with a median value of 3.33 are the critical success factors that are found to be existed in the reals estate companies. On the contrary, project team's motivation and goal orientation with a mean value of 2.60, project manager's capabilities and experience with a median value of 2.80 and safety precautions and applied procedures with a median value of 2.60 are found to be the critical success factors not existed in the real estate companies.

4.1.4. Project Success (Success Criteria)

Next to assessing the presence of critical success factors in the real estate development of Addis Ababa, the study evaluated the success level of project management. The project management success in the real estate construction projects is investigated from three different dimensions of the 'Iron Triangle' of project management. Respondents were asked whether or not they have completed the most recent project they have managed within the given time, cost and quality targets. Their response is presented in the table below.

Table 4.11. *Project Success*

	Project Success		***No***	***Yes***	***Total***
PSC1	I have completed the most recent project I managed on the scheduled time.	**Frequency**	68	37	105
		Percent	65%	35%	100%
PSC2	I have completed the most recent project I managed on the budget allotted.	**Frequency**	75	30	105
		Percent	71.4%	28.6%	100%
PSC3	I have completed the most recent project I managed meeting the quality standard assigned.	**Frequency**	60	45	105
		Percent	57.1%	42.9%	100%

According to the data, only 37 (35%) of the respondents have completed the most recent project they have managed on the scheduled time where the other 68 (65%) are failed to do so. In terms of budget, only 30 (28.6%) of the respondents were able to complete the last project they have managed with the allocated budget while the other 75 (71.4%) needed additional financial resources to complete the projects. Lastly, project managers were asked if the maintained the planned quality level in the most recent project they have managed and which 60 (57.1%) of them have failed to do so.

This leads in to a conclusion that real estate development construction projects in Addis Ababa city mostly fail to be delivered in the planned time, budget and quality standards. This indicates that project management is not successful in each of the three measurements.

4.2. Correlation Analysis

Studying the level of interdependence between independent variables is another aspect of project management that the student researcher has tried to assess. Pearson's correlations was used to evaluate the type and strength of relation existed between the independent variables. Pearson's correlation is the most widely used method of measuring the degree of relationship between variables. The interdependency is measured according to the scale recommended by Hair et al (2002) and presented in the table below.

Table 4.12. *Relation measurement scale between variables*

	No relation	***Week relation***	***Moderate relation***	***Strong relation***	***Very strong relation***
Pearson Correlation	0.00-0.20	0.21-0.40	0.41-0.60	0.61-0.80	0.80-1.00

Sources: Hair et al (2002)

Table 4.13. *Correlations analysis*

		PS1 (TIME)	***PS2 (COST)***	***PS3 (QUALITY)***
AVOP	Pearson Correlation	-.112	.103	.246*
	Sig. (2-tailed)	.255	.298	.011
	N	105	105	105
AVPMGC	Pearson Correlation	.082	.128	.269**
	Sig. (2-tailed)	.403	.194	.006
	N	105	105	105
AVPTMGO	Pearson Correlation	.095	.153	.304**
	Sig. (2-tailed)	.337	.118	.002
	N	105	105	105
AVPSWD	Pearson Correlation	.152	.055	.280**
	Sig. (2-tailed)	.121	.575	.004
	N	105	105	105
AVPMCE	Pearson Correlation	.241*	.132	.398**
	Sig. (2-tailed)	.013	.180	.000
	N	105	105	105
AVSPAP	Pearson Correlation	.139	.274**	.265**
	Sig. (2-tailed)	.157	.005	.006
	N	105	105	105
AVCS	Pearson Correlation	.346**	.376**	.724**
	Sig. (2-tailed)	.000	.000	.000
	N	105	105	105

**. Correlation is significant at the 0.05 level (2-tailed).*

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

The correlation results between independent and dependent variables found to be significant at 1 and 5 percent. The result indicate the existence of positive but weak relationships between all the variables with the exception of one relationship. In the relationship existed between control systems and project completion in the planned quality standards indicates a strong positive relationship with a Pearson's correlation value of 0.72.

Weak yet positive relationship is existed between the first dependent variable, that is timely project completion, and the independent variables project managers competency and experience (0.24) and control systems (0.35). On the other hand, the same type of relationship is existed between the second dependent variable, that is project completion in the allotted budget, and the critical success factors safety precautions and applied procedures (0.27) and control systems (0.376). Finally, the same type of relationship is existed between the third dependent variable (meeting the quality standards) and the critical success factors, organizational planning (0.25), project managers goal commitment (0.27), project team motivation and goal orientation (0.30), project scope and work definition (0.28), project managers competency and experience (0.40), safety precautions and applied procedures (0.27), and control systems (0.72).

Where positive relationship is existed between dependent and independent variables, an improvement in the independent variable is observed, the dependent variable reacts in the same manner. In other words, increasing the independent variables those have positive relationship with the dependent variable, the dependent variables will also indicate improvement which increase the likelihood of project management success. The reverse is also true where if a significant negative relationship between dependent and independent variables exist, and increase in the independent variable exist, the dependent variable indicated a decrement.

Luckily, the only negative relationship indicated in the correlation matrix is the one existed between the independent variable organizational planning and the dependent variable timely project completion which is not found to be. Meaning, the change to be happen in any direction on the variable organizational planning is not significant enough to impact timely project completion whatsoever.

4.3. Model Estimation and Hypothesis Testing

In order to analyze the impact of the critical success factors on project success, a binary logistic regression model was estimated through maximum likelihood estimation method. In the model, the three project success criteria (Iron Triangle) are considered as dependent variable while Ashley's (1987) seven critical success factors for construction projects are used as an explanatory variables.

Successful project completion in all the three criteria was codded as '1' where failure was codded '0'. The set of independent variables that are included in the model are organizational planning (OP), project manager goal commitment (PMGC), project team motivation and goal orientation (PTMGO), project scope and work definition (PSWD), project manager capabilities and experience (PMCE), safety precautions and applied procedures (SPAP) and control systems (CS).

The variables were presented in a statistical equations as follows:

$$P(T) = \alpha_0 + \alpha_1 OP + \alpha_2 PMGC + \alpha_3 PTMGO + \alpha_4 PSWD + \alpha_5 PTMTC + \alpha_6 SPAP + \alpha_7 CS + \varepsilon \ldots (1)$$

$$P(C) = \beta_0 + \beta_1 OP + \beta_2 PMGC + \beta_3 PTMGO + \beta_4 PSWD + \beta_5 PTMTC + \beta_6 SPAP + \beta_7 CS + \varepsilon \ldots (2)$$

$$P(Q) = \mu_0 + \mu_1 OP + \mu_2 PMGC + \mu_3 PTMGO + \mu_4 PSWD + \mu_5 PTMTC + \mu_6 SPAP + \mu_7 CS + \varepsilon \ldots (3)$$

Logistic regression, which is similar with that of ordinary least square (OLS) regression, is used to estimate the model. Both methods can be used to determine which predictor variables are statistically significant. However, in OLS regression, the independent variable is continuous and in logistic regression, it is binary and coded as 0 and 1.

Thus, logistic regression is used in this study to find out the critical success factors that have a potential impact on real estate development construction projects and to accept and reject the study's hypothesis. Critical success factors those have significant impacts on project success at (0.01) 1%, (0.05) 5% and (0.10) 10% have proved the associated null hypotheses where the rest failed to do so indicating the existence of no significant impact on project success (dependent variable).

In the model estimation, beta/slope coefficients (β) and odd ratios (OR) for each variable are reported. The beta (β) coefficient indicates the expected change in the natural logs of odds ratio of dependent variable or project success because of one unit change in explanatory variable with

all of the other variables in the model held constant. A relatively unambiguous term odds ratio is the ratio of two odds. The odd of an event happening by itself is defined as the probability that the event occurs divided by the probability that the event does not occur. Odds ratio is the transformed log or an exponential of beta coefficients.

If a beta coefficient is positive, its transformed log value (odds ratio) will be greater than one, meaning that project success is more likely to occur. If a coefficient is negative, its transformed log value will be less than one, and the odds of the event occurring or the probability of project success decreases. A coefficient of zero (0) has a transformed log value of 1.0, meaning that this coefficient does not change the odds of the event or project success by one way or the other.

The likelihood ratio (LR) chi-square test is used to test the over significance of the model. The test has a null hypothesis of no difference between the model with only a constant and the model with independent variables. The null hypothesis of the test is that there is no difference between the model with only a constant and the model with independent variables.

Chi-square for the tested models is equal to 18.01 (0. 0119) for the first model, 24.89 (0.0008) for the second and 33.89 (0.00) forte third model. That means, the null hypothesis of no difference between the model with only a constant and the model with independent variables is rejected in all three models. Thus, there exist a significant relationship between the independent and the dependent variables.

The model goodness of fit is also evaluated through Pseudo R-square with a predicted values of 0.22 for the first, 0.19 for the second and 0.53 for the third models that may explain how much the variation in dependent variable is explained by explanatory variables. However, this measures of goodness of fit is not as reliable as R-squared that is found in OLS as of many authors (Hosmer and Lemeshow, 2000).

According to IDRI (2003), it is possible to detect a multicollinearity problem by examining the standard error for the beta coefficients. A standard error larger than 2 may indicates an existence of multicollinearity among independent variables. However, since robust regression is used in the estimation, there is no problem of heteroscedasticity in the models.

The diagnostic tests discussed so far indicates that it is pertinent to interpret the model in order to draw an inference from the tested models. Thus, the estimated result of the three models along

with diagnostic test result are presented in the table below followed by hypothesis testing and discussions on factors that are found to be significant in the models.

Table 4.14. *Results of logistic regression estimates of determinates of project management success*

	Model 1 Dependent variable: PSC 1 (Time)			**Model 2 Dependent Variable: PSC2 (Cost)**			**Model 3 Dependent variable: PCS 3 (Quality)**		
VARIABLES	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio
AVOP	-1.653***	.002	0.191***	0.246	.635	1.278	-0.12	.873	0.887
	(0.543)		(0.104)	(0.532)		(0.680)	(-0.456)		(0.404)
AVPMGC	-0.462	.47	0.630	-0.0631	.920	0.939	-1.301**	.102	0.272**
	(0.590)		(0.372)	(0.577)		(0.542)	(-0.602)		(0.164)
AVPTMGO	0.150	.80	1.162	0.482	.366	1.619	1.596***	.116	4.933***
	(0.591)		(0.687)	(0.520)		(0.842)	(-0.473)		(2.335)
AVPSWD	-0.0467	.92	0.954	-0.603	.175	0.547	-0.587	.424	0.556
	(0.471)		(0.450)	(0.467)		(0.255)	(-0.505)		(0.281)
AVPMCE	1.448***	.017	4.254***	-0.651	.289	0.522	0.941	.249	2.563
	(0.560)		(2.383)	(0.610)		(0.318)	(-0.585)		(1.499)
AVSPAP	-0.634	.15	0.530	0.977**	.044	2.656**	-0.231	.718	0.794
	(0.403)		(0.214)	(0.442)		(1.173)	(-0.352)		(0.279)
AVCS	1.186***	.002	3.274***	1.094***	.002	2.985***	2.959***	.000	19.28***
	(0.451)		(1.478)	(0.305)		(0.911)	(-0.591)		(11.38)
Constant	-0.383	.82	0.682	0.00621*	.013	-5.082*	-9.900***	.001	5.02e-05***
	(1.793)		(1.223)	(0.0165)		(2.664)	(-2.876)		(0.000144)
Observations	105		105	105		105	105		105
Wald chi2(7)	18.01			24.89			33.89		
Prob > chi2	0.0119			0.0008			0.0000		
Pseudo R2	0.2166			0.1869			0.5255		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

H1: Organizational planning effort has a significant positive impact on project management success in real estate construction projects.

Organizational planning (planning of designs and constructions) has been found to have a significant impact on the probability of project management success though the impact is negative and opposite to what is hypothesized and expected. The estimated odds ratio indicated the probability of project management success declines as organizational planning efforts are increased. When the agreement level of organizational planning increase by 1 unit, the odds ratio of timely project completion increase by 0.19. It is known that when the odds ratio is lesser than 1, it implies that the probability of an event occurring, in this particular case timely project completion, decrease. This rejects the null hypothesis as the impact organizational planning have towards project success is negative.

Planning practices in construction projects are argued by several authors and researchers to have a positive impact on project management success. Ashley and Jaselskis (1987), Sanvido et al (1992) and other many researchers have proven construction planning practices in one or another way have positive impacts in their investigations conducted in different countries. However, the findings of this study indicates organizational planning is not a success factor for construction project management success rather it impact the likelihood of successful project completion negatively.

H2: Project manager goal commitment has a significant positive impact on project management success in real estate construction projects.

Though project manager's goal commitment does not significantly impact successful project completion in terms of time and allocated budget, it has an unexpected negative impact on project completion meeting planned quality level. The model estimation indicated an odds ratio increment by 0.28 when respondents' level of agreement about project manager goal commitment increase by 1 unit. Once again here is an odds ratio values lesser than 1 indicating a decrement on the probability of successful project completion in terms of planned quality level.

This fining stands against the theory and the second hypothesis of the study which stated project manager's goal commitment has a positive impact on project management success which it doesn't in this particular case. Thus, the second hypothesis is disproved.

H3: Project team motivation and goal orientation has a significant positive impact on project management success in real estate construction projects.

Earlier in the analysis, respondents' response indicated that project team members lack the motivation and goal oriented-ness. Yet, this success factor found to possess a significant positive impact on project completion meeting the planned quality level. The model test indicate a 1 unit increase in the level of agreement by respondents' on project team members goal commitment and goal orientation leads to a 4.9 increase on the odds ratio of successful project completion in terms of quality.

The result leads in to a conclusion that the more project team members are motivated and goal oriented, the more will be the probability of the construction project meets planned quality requirements. This makes the null hypothesis acceptable which state project success is significantly and positively impacted by the project team members' motivation and goal orientation.

H4: Project scope and work definition has a significant positive impact on project management success in real estate construction projects.

As the models tasted, the success factor project scope and work definition couldn't found to have any kind of significant impact in any of the dependent variables. This implies that a change in the respondents' agreement level in the project scope and work definition, any of the dependent variables (time, cost and quality) do not significantly impacted. This disprove the null hypothesis which states project scope and work definition positively and significantly impact project management success.

H5: Project managers' capability and experience has a significant positive impact on project management success in real estate construction projects.

When asked to rank the critical success factors according to their potential in successful project completion, most of the respondents ranked project managers' capability and experience as presented in table 4.2. While testing the models, a result that goes along with that finding have found. The odds ratio of the relationship between project managers' competency and experience and successful project completion in terms of time is 4.3. Meaning, a 1 unit increase in the agreement level of respondents response increase the odds ratio of timely project completion by

4.3. This indicates the strong positive impact project managers' competency and experience have over timely project completion that is project management success.

The fifth hypothesis is proven to be correct as it claims project managers' competency and experience has a significant positive impact on project success which actually has.

H6: Safety precautions and applied procedures has a significant positive impact on project management success in real estate construction projects.

The student researcher started the investigation hypothesizing safety precautions and applied procedures of the real-estate developing companies have a significant positive impact on the success of project management success. As expected, the variable found to have a significant impact on the probability of the dependent variable occurring. When the level of agreement about the existence of proper safety precautions and applied procedures, the odds ratio of successful project completion in terms of cost increase by 2.7.

Since the increment in the odds ratio is higher than 1, the impact of safety precautions and applied procedures over project success in terms of cost is positive. This supports the null hypothesis the student researcher stared the investigation with.

H7: The availability proper control systems has a significant positive impact on project management success in real estate construction projects.

Though it has ranked by respondents as the sixth important success criteria for project success, the presence of proper controlling systems found to have a significant positive impact over all the three dimensions of project success. For every 1 unit increment in the agreement level of the presence of proper control systems in the real estate developers, odds ratio of timely project completion increase by 3.3 and it increase by 2.98 and 19.28 respectively for successful project completion in terms of cost and quality. This makes control system the only variable that has a significant positive impact on all measures of project management success.

The finding proves the null hypothesis which states the control system has a significant positive impact on project success.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

With the intent of meeting the study's objective of finding out the existence level of critical success factors in real estate construction projects and their impact on successful project completion, the student researcher had presented in-depth analysis of findings in the prior chapter. In this final chapter, the findings of the study are summarized and presented along with their implications, concluding remarks and recommendations.

5.1. Conclusion

As confirmed from the sample taken for the analysis, only four out of the seven critical success factors are found to exist in the real estates from which only one have a significant positive impact on project management success.

Planning of construction and design works (organizational planning) are found to exist in the real estate yet the practice still lacks properly planning project schedules and construction completion time. The success factor also found to have a significant negative impact on project management success against what is theoretically right and expected. This indicates though organizational planning is practiced in the real estates, it is not being done correctly in a way that contributes for the success of project management.

However project managers believe they are fully committed for the attainment of goals of the projects, their effort in this dimension is hurting the success of project management than it is benefiting. Project managers also failed to motivate and initiate subordinate team members towards successful completion of projects.

Regardless of its significant positive impact over project management success, real estate developers have failed to motivate project team members and to make them and their effort goal oriented. Irrespective of the qualities project team members have in providing idea on how to increase the likelihood of project success, they lack the motivation and the willingness to take assignments that have greater importance for the project management success. The successful completion of the project is also found not to be the prior intention of the team members. These all led for the real estate developers to miss one of the most important success factor of

construction projects which is proven to have a significant positive impact on project management success.

Though it doesn't significantly impact project management success in any direction, a proper definition of work and scope definition is being practiced in the real estate developer. Works to be done in construction projects, what the projects are and are not about and responsibilities of project participants, what activities to be done and what outcome to expect and the criteria by which project success is measured are well clarified.

Once again, real estate developers have missed a critical success factor that is proven to have a significant positive impact on project management success. Notwithstanding of being considered the most prior critical success factor for construction project management success and proven to have a positive impact, project manager's competency and experience is found not to be adequate in the real estate development construction projects. Project managers are rich in technical capabilities though they lack the needed managerial capability. It is also true that project managers are assigned in the position without possessing the required capabilities and they fail to produce alternative directions when the project struggles to succeed.

One of the very critical issues in any kind of construction, that is safety, is overlooked is real estate development construction projects. Safety precautions and applied procedures are also found to have a significant positive impact on project management success, yet are still not properly being thought of. Real estate construction projects found to lack adequate trainings on the safety of machineries and personals, properly designed safety standards and follow-up on the proper implementation of the safety standards. Accidents those could have been prevented if proper safety precaution were taken also seen to happen in the real estate development construction projects.

The one and only success factor that has a positive significant impact on project success and existed in the real estate development construction projects is control systems. Proper controlling systems monitoring the successful completion of projects in terms of time, cost and quality are implemented in the real estate development construction projects. Luckily, this is also the one and only success factor that positively impact all the three measures of project success which are time, cost and quality.

In general, only one of the critical success factor that possesses a significant positive impact is found to exist in the real estate construction projects though there are three others which the real estate development construction projects have missed. Also among the critical success factors that are existed in the projects, some are found to have a negative impact in project management success against what is theoretically right. The cumulative effect of this have made real estate development construction projects' management to most likely fail than succeed in all three measures.

5.2. Implications and Recommendations

Along with other stakeholders, real estate developers responsible of playing greater role in the reduction of the critical housing problem in the city. However, according to the findings of this study, real estate development construction projects are failing in every measure of project success. Real estate development construction projects take longer time than planned to be completed which by itself is a cause for cost overruns of projects. This leads the construction projects in to failure in being completed in the allocated budget. Planned quality standards are also found to be compromised.

Struggling with all these, it is wrong to expect for the real estate development sector to properly discharge its responsibility in reducing the housing problem. This calls for critical assessment of current practices and improvement in areas those are causing such failures. Implications and some possible recommendations on how to improve the identified problems are tried to be provided by the student researcher with the intention of improving project management success probability. The implications and recommendations are presented below.

- ✓ The planning practice of construction and design works which the real estate construction project managers argue to do right are negatively harming the likelihood of conation project management success. A reconsideration is due on the designing and construction planning to find out why it is harming the likelihood of project management success when it is supposed to positively contribute to the project success.
- ✓ What the project managers are believed to make their commitment for the project goal attainment is negatively affecting the probability of project management success. Project managers need to evaluate their commitment and shall try to find out which part of their activity that they believe to make them committed but causing failure and work on personal development for improvement.

- ✓ As most of the practical activities of construction projects are carried out by project team members, their motivation and goal oriented-ness is very critical for successful project management. It is also proven to be true in the findings of the study magnifying the importance of focusing on motivating project team members. Yet, before making any move, the specific problems that caused the lack of motivation by the project team members need to be identified. This calls for an investigation to be conducted on employees' motivation which the real estate developers take the initiative of. Furthermore, the real estate developer should not hesitate in taking corrective actions as to be recommended by the study.
- ✓ The more project managers are competent, the higher the probability of attaining project management success. This calls for capacity building activities on the current project managers and recruitment of only-and-only capable new project managers. For existing project managers, capacity building shall be done through:
    - ⇨ Facilitating trainings for the project managers,
    - ⇨ Availing sponsorship in tuition fees of the managers educations, and
    - ⇨ Uninterrupted updating project managers on improvements in the construction sector.

  In recruiting new project managers, real estate developers shall critically evaluate the experience and credentials of applicants which they claim to have. Applicants who are professionals and equipped with the required credentials should be hired.

- ✓ The safety standard which is overlooked by the real estate developers need to be focused on as employees are more productive when their safety at work place is not questionable. What safety practices need to be practiced that best protect employees and machineries from harm in Ethiopian construction need to be assessed and a safety procedure that feats best need to be designed. The Personal Protective Equipment (PPE) for Construction recommended by Environmental Health Safety (EHS) recommend construction workers on duty should at least:
    - ⇨ Protective gloves,
    - ⇨ Hearing protection,
    - ⇨ Full face shields when cutting, grinding, or chipping,
    - ⇨ Chemical splash goggles,

- ⇨ Respiratory protection, and
- ⇨ Fall protection equipment when working above 6 feet

For the machineries and equipment also, the development and practice of safety precautions and applied procedures will extend years of service maintaining the quality.

In general, taking into consideration what it could contribute for the nation and the society if project managements would be more successful in real estate development construction, greater emphasis shall be given for improvement. In that process, experience sharing between domestic and international companies (real estates) on how to successfully manage construction projects would play a significant role. Closely working with local and international academic institutions will also help to access improvements and updates in the construction sector.

Overall, the real estate developers and all stakeholders need to understand the critical nature of the responsibility they are bearing and act unreservedly for an improved successful project management.

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APPENDICES

APPENDIX -A

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This questionaire is prepared for the purpose of collecting data for the study to be undertaken under the title of "Investigating Success Factors For Real Estate Development Construction Projects With Special Reference To Real Estates In Addis Ababa City." The questionaire is prepared only for acadamic purpose and its confidentiality is well protected. The student researcher respectfully request dear respondents to follow the instructions and provide honest answers for the questions. Should you have any enquiry, please be free to contact the researcher at the following addresses:

E-mail: **melove.girma@gmail.com**

Telephone: **0937-986896**

Thank you for your cooperation!

1. BACKGROUND OF RESPONDENTS

Instruction: Please provide your response for the questions related to your personal background by putting 'X' sign in the circles.

Sex: ◯ Male ◯ Female

Age: under 25 ◯ 26-35 ◯ 36-40 ◯ 46-65 ◯

Educational Status: ◯ Diploma ◯ 1st Degree ◯ 2nd Degree and above

Experience as a project manager: ◯ below 3 Years ◯ 3-6 Years ◯ 6-10 ears ◯ above 10 Years

2. PROJECT SUCESS

Instruction: Rank the items presented in the table from 1st to 7th based on their importance for project success. You may leave item/s unranked that you believe have no importance for successful project completion.

No.	Items	Rank
1.	Project manager goal commitment	
2.	Clarity of the project's scope and work definition	
3.	Project team's motivation and goal orientation	
4.	Use of proper control systems	
5.	Safety precautions and applied procedures	
6.	Proper organizational planning(Construction and design planning effort)	
7.	Project manager's capabilities and experience	

3. PROJECT SUCCESS FACTORS

Instruction: Read the statements in the table and show to what extent you agree with them by marking (X) sign. The numbers represent: 1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree.

Project Success Factors

No.	Items	1 SD	2 D	3 N	4 A	5 SA
Organizational planning						
1.	Adequate consideration and attention is given in designing buildings.					
2.	Constructions are throughly planned in advance before they are started.					
3.	Resources needed to carry out construction projects are well recognized in advance.					
4.	There is a proper estimation of the cost that will be needed to complete the construction.					
5.	Project schedule and construction completion time are well planned.					

Project manager goal commitment		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**
6.	Project managers are devoted to meet goal of the project they have assigned on.					
7.	Project managers initiate their team members for successfully completing the project.					
8.	The goals set for projects are perceived to be attainable by project managers.					
9.	Project managers often evaluate if the project is on the right path to meet its intended goal.					
10.	Project managers resist interferences and influences that might challenge project goal achievement.					
Project team's motivation and goal orientation		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**
11.	Project team members are motivated enough to turn the project they are assigned on in to a success.					
12.	Ideas of how to improve project performance are forwarded by project team members.					
13.	The effort of project team members is directed on activities that contribute for the project success.					
14.	Attaining the project goal is the priority for of the project team members.					
15.	Project team members accept any assignment as long as it would help for project goal attainment.					
Clarity of the project's scope and work definition		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**
16.	What projects are and aren't about is well clarified.					
17.	Works to be done in construction projects are listed and defined properly.					
18.	Responsibilities of project participant parties are well illustrated.					
19.	What major activities need to be done and to what end result does they lead is clearly defined.					
20.	Criteria to measure whether a project is successful or not is placed in advance.					
Project manager's capabilities and experience		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**

21.	Project managers are rich in technical capabilities that are needed to manage the project.					
22.	Project managers are rich in managerial capabilities that are needed to manage the project.					
23.	Alternative direction that leads to project goal achievement is provided by project managers when the first plan fails.					
24.	Project managers strongly bargain for the interest of the project not to be affected.					
25.	Project managers are assigned on projects only when they are believed to possess the required capabilities and experience.					
Safety precautions and applied procedures		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**
26.	The real estate pays greater attention for the safety of personnel and machineries throughout its operation.					
27.	Trainings on how to keep personnel and machineries from harm is facilitated by the real estate.					
28.	Accidents that could have been prevented if safety procedures are implemented are not observed in the real estate's projects.					
29.	The real estate has a well-designed safety standard.					
30.	The real estate monitors the implementation of its safety standards.					
Use of control systems		**1 SD**	**2 D**	**3 N**	**4 A**	**5 SA**
31.	Control systems to assure projects' timely completion are implemented.					
32.	Control systems that assure projects' completion within the cost limit are implemented.					
33.	Control systems that assure projects' completion based on the intended quality level are implemented.					

4. PROJECT SUCCESS CRITERIA

Instruction: Read the statements in the table and show if the last project you have completed meet the three success criteria by marking (X) sign. The numbers represent: 1 Yes and 2 No.

Project Success (Time, Cost, Quality)

No.	Items	Yes 1	No 2
1.	I have completed the most recent project I managed on the scheduled time.		
2.	I have completed the most recent project I managed on the budget alloted.		
3.	I have completed the most recent project I managed meeting the quality standard assigned.		

- If there is anything that you would like to add?

_____

_____

_____.

APPENDIX -B

Model Testing

Time (PS1)

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	106.750[a]	.245	.337

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AVOP	-1.653	.536	9.516	1	.002	.191
	AVPMGC	-.462	.635	.530	1	.467	.630
	AVPTMGO	.150	.592	.064	1	.800	1.162
	AVPSWD	-.047	.440	.011	1	.915	.954
	AVPMCE	1.448	.607	5.691	1	.017	4.254
	AVSPAP	-.634	.439	2.087	1	.149	.530
	AVCS	1.186	.382	9.620	1	.002	3.274
	Constant	-.383	1.713	.050	1	.823	.682

a. Variable(s) entered on step 1: AVOP, AVPMGC, AVPTMGO, AVPSWD, AVPMCE, AVSPAP, AVCS.

Cost (PS2)

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	102.157[a]	.200	.287

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AVOP	.246	.517	.226	1	.635	1.278
	AVPMGC	-.063	.632	.010	1	.920	.939
	AVPTMGO	.482	.533	.818	1	.366	1.619
	AVPSWD	-.603	.445	1.838	1	.175	.547
	AVPMCE	-.651	.614	1.123	1	.289	.522
	AVSPAP	.977	.486	4.048	1	.044	2.656
	AVCS	1.094	.346	10.013	1	.002	2.985
	Constant	-5.082	2.045	6.177	1	.013	.006

a. Variable(s) entered on step 1: AVOP, AVPMGC, AVPTMGO, AVPSWD, AVPMCE, AVSPAP, AVCS.

Quality (PS3)

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	68.049[a]	.512	.688

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AVOP	-.120	.747	.026	1	.873	.887
	AVPMGC	-1.301	.795	2.678	1	.102	.272
	AVPTMGO	1.596	1.014	2.476	1	.116	4.933
	AVPSWD	-.587	.735	.638	1	.424	.556
	AVPMCE	.941	.817	1.327	1	.249	2.563
	AVSPAP	-.231	.641	.130	1	.718	.794
	AVCS	2.959	.724	16.703	1	.000	19.276
	Constant	-9.900	2.969	11.118	1	.001	.000

a. Variable(s) entered on step 1: AVOP, AVPMGC, AVPTMGO, AVPSWD, AVPMCE, AVSPAP, AVCS.

APPENDIX -C

Declaration

I Melat Girma declare that this thesis conducted under the title *Investigating Success Factors For Real Estate Development Construction Projects with Special Reference to Real Estates in Addis Ababa City* is my original work, prepared under the guidance of Solomon Markos (PHD). All the sources of materials used for thesis have been full acknowledged. I further confirm that the study has not been submitted in part or in full to any other higher learning institutions for the purpose of earning a degree.

Melat Girma _____

St. Marry's University, Addis Ababa **January, 2017**

Endorsement

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as university advisor.

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