

Determinants of Project Implementation Delay: The Case of Selected Projects Financed by Development Bank of Ethiopia

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Abstract

The objective of this study is to identify the major determinants of project implementation delay. The research targeted projects financed by the Development Bank of Ethiopia. The independent variables causing project implementation delay are poor project initiation, poor project planning/design system, improper implementation, poor project monitoring, evaluation and controlling system, poor communication, improper project closure, and the dependent variable is project delay. The study considered 125 projects through stratified sampling method from projects financed by the Bank. Data were collected from randomly selected project managers using structured questionnaire and secondary data were also used. Data were analyzed using linear regression method. According to the findings, a strong, positive and significant relationship was observed between delay factors considered as independent variables and project delay. Among the six delay factors (poor project initiation, poor project planning/design system, improper implementation, poor project monitoring, evaluation and controlling system, poor communication and improper project closure), poor project initiation was identified and concluded as the determinants with the highest influence on project completion delay. So that any business initiators should select project those are more familiar and interesting for them and scope of project should be established, controlled and must be clearly defined and be limited.

Keywords: Project Financing, Project Implementation and Project Completion Delay, Development Bank of Ethiopia.

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1. INTRODUCTION

1.1 Background of the Study

Projects are considered delayed when their stipulated completion durations have not been achieved. The inability to complete projects on time and within budget continues to be a chronic problem worldwide and is worsening (Ahmed *et al.*, 2002). According to Ashley *et al.* (2008) the trend of cost overrun is common worldwide and that it is more severe in developing countries. The subject of completion of project is therefore a universal concern that affects all parties to a construction project. It is thus in the interest of the project management as an emerging profession to address all the factors that affect completion of construction project. Indeed the idea of EPC contracts was conceived to partly transfer the risks involved in project implementation largely to the contractor charged with implementing it. The contractor usually has a limited ability to claim additional money which is limited to the circumstances where the project company has delayed the contractor or has ordered the variation of the works (McNair *et al.*, 2011).

Delay could be defined as an act or event that extends the time required to perform the tasks under a contract. It usually shows up as additional days of work or as a delayed start of an activity (Sweis *et al.*, 2007). Projects have a variety of reasons to experience delay. An investigation to find out the reasons for the delays was conducted in Hong Kong where a questionnaire was developed on factors that were identified in previous findings. The analysis of indicated the difference in perception of the factors that was between the key stakeholders of the project. There was general agreement about the relative importance of delay factors such as unforeseen ground conditions (Kumaraswamy *et al.*, 1998). The delays can be controlled by improving productivity and factors that affect productivity are dealt with the purpose of

further increasing productivity and thereby reducing delays. The conclusion of the investigation is ranking of the factors and factor categories that are considered by various project stakeholders. The areas of disparity between the stakeholders are indicated by their experiences, prejudices and ineffective communication. Thus the project scope factors can be supported by effective communications between all stakeholders.

According to Abdalla *et al.* (2002) projects encounter massive delays and thereby overshoot the initial time and cost estimates which in turn result in extensive delays providing a platform for claims and disputes. A survey done with the objective of finding the most important reasons for delays as per the traditional contracts indicate that contractors and consultants agreed that owner interference, inadequate contractor experience, financing and payments, labor productivity, slow decision making, improper planning, and subcontractors are among the top ten most important factors. According to Assaf *et al.* (2006) in construction, delay could be defined as the time overrun either beyond completion date specified in a contract, or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule and is considered as common problem in construction projects. In some cases, to the contractor, delay means higher overhead costs because of longer work period, higher material costs through inflation, and due to labour cost increases. Time, cost and quality are the basic of successful construction which include also the safety and it environment. Time and cost had parallel relationship which the increasing of the time will make the increasing of the cost. Then, the controlled of time is really important for avoid any loss to the contractor. The time that already discuss is the period which is the schedule for the activities from beginning until finish the process of planning.

Delay implementation of projects and cost increase are common phenomena in projects worldwide. However, these are especially severe in developing countries. Implementation delay gives a project a difficult start, unduly long time taken for project implementation results in time-overrun which is invariably followed by cost overrun. Cost-overrun has the ill effect of affecting the financial viability of the project. The problem of cost-overrun will get more compounded if the finance necessary to meet the increased cost cannot be arranged in time. Any delay in arranging for the finance needed to meet the cost overrun will only further tend to increase the cost and this may land the project in trouble leading eventually to the death of the project and the project may not take off (Adhikarib, 2002). Delays are endemic to the construction projects in Ethiopia. By examining 15 completed projects in different region of the country, the delay encountered in most projects range from 20.66% to 50% of original contract time. Project delays are the major causes of claims for time extension and associated cost (Abdissa, 2003). The authors further pointed out that the most common causes of delays and their associated costs, us shortage of spare parts, untimely payment, poor planning and control, increase in scope (design changes/extras), differing soil and site conditions, limited access to the site (partially or totally) not ready for work to progress, unusual and long rainy weather condition, war and instability, Poorly equipped contractors and public sector agencies lack of motivation, and lack of experience in project management.

1.2. Statement of the Problem

It is clearly stated in the Bank's credit policy that the major aim of the Development Bank of Ethiopia is to extend medium to long-term loans for investment projects in the priority areas set by the Government. All projects financed by the bank were approved taking into consideration the project

appraisal and its implementation schedule however, a good number of projects have not been executed in line with the designed implementation schedule. This trend has caused influence on project operational successfulness and the loan recovery performance of the bank significantly (Development Bank of Ethiopia, 2008). As it has been observed that most DBE financed agricultural and industrial projects implementation schedule lag behind from what was planned in the feasibility studies submitted by the project owners to the Bank and on revised appraisals studies of the Bank and as a result, there is frequently request for an additional loan for missing items and incomplete construction works and loan repayment rescheduling request by most huge and large sized projects due to delayed of implementation schedule derived mainly from external and internal causes (Development Bank of Ethiopia, 2008). In addition to this, currently it is common to watch foreclosure advertisement of different Banks on newspaper and television window every day and this simply indicate that the failure of many projects. Case example, Past Service projects like Hotels, Schools, and Hospitals and Agricultural project financed by DBE still under foreclosure (Development Bank of Ethiopia, 2011).

This situation resulted great apprehension on the part of potential investors not to look for Bank finance with the perception that credit is the main cause for project failure. Moreover, the failure of projects increases sunk cost of the country irrespective of their ownership since fixed investments of most projects are purpose oriented and require high switching cost. Understanding the prevailing perception in the country, Development Bank of Ethiopia has set zero tolerance for project failure in the year 2010 E.C. According to Assaf and Al-Hejji (2006) some key causes of delay according to clients are contractor's improper planning, contractor's poor site management, subcontractor issues, and skilled labor supply and productivity; contractors are insufficient client's payments for completed and ongoing work, acquiring difficulties for work

permit and approval, and availability and failure of equipment. When large projects deviate from their objectives (either in cost, completion time, performance, safety or environmental effects), the damage caused obviously transcends out of the contracting parties and affects the project stakeholders and the public at large. Emphasizing the completion time deviation factors as they are very common in our country's construction industry, lack of justified methodologies in quantifying and analyzing delays happens to be the greater challenge (Abebe, 2003). This is because, not also the delays come from a variety of sources, and they also have different effects and implications resulting in complex ramifications, creating considerable difficulty to practitioners in the claim resolution (Kumaaswany, 1997). A critical review of literature suggested that the reason for the continuing difficulty with delay claim resolution can be attributed to a number of problems including lack of uniformity in the application of delay identifying methodologies, lack of sufficient guidance from contacts and poor planning practice. After an in depth review of empirical literature the researcher has reached to a conclusion that there is no literature available on the factors influencing completion of projects in Ethiopian Country especially for industrial project. This study therefore aimed to investigate the actual factors influencing of project completion in Ethiopian Country the case are project financed by DBE.

In lights of these problems conducting this research on the case Bank is to determine delay factors in project implementation and also to adopt an appropriate framework for improving delay analysis and administration methods. The study focused projects financed between January 2012 to December 2014 in the core process of the Bank at Corporate level i.e. Credit Process was selected.

In a bid to fill the knowledge gap, the study attempted to address the following research objectives:

- ❖ To examine the relationships between poor project initiation and completion of projects.
- ❖ To investigate the relationships between poor planning and design system and completion of projects.
- ❖ To find out the relationships between improper implementation and completion of projects.
- ❖ To investigate the relationships between poor project monitoring, evaluation and controlling system and completion of projects
- ❖ To examine the relationships between poor communication and completion of projects.
- ❖ To investigate the relationships between improper project closure and completion of projects.

2. LITERATURE REVIEW

Different researchers in different countries investigate factors influencing project completion from different perspectives. In this sub section, the mythology used and findings identified on studies conducted on project completion influencing factors are reviewed.

2.1 Project Initiation and completion of projects

Chan and Kumaraswamy (1997) have determined and evaluated the factors causing delays for construction projects in Hong Kong. They have identified 83 hypothesized delay factors and grouped them into eight categories. The main reasons for delay were analyzed and ranked according to different groups classified on the basis of (a) role of the parties in the local construction industry (i.e. whether clients, consultants and contractors) and (b) the type of projects.

They collected data from 167 local construction organizations and analyzed it by using the relative impact index method in order to rank the determinant delay factors for different types of construction projects. The results indicate the principal and common causes of delays are: Improper define the project scope and Lack recruit appropriate staff , unforeseen ground conditions, low speed of decision making involving all the project team, Poor job description for a project manager, Lack of comprehensiveness of feasibility study and Analysis client initiated variations and necessary variations of works.

2.2 Project planning and completion of projects

Project planning comes into play at the shakedown phase in project development. Poor project planning can easily bring down response strategies where they are at the threshold or the completion stage. Achievements should be measured against project goals. The progress of the response strategies should be monitored actively through set milestones and targets. Two criteria may be used; project management based criteria should be used to measure against completion dates, costs and quality. Then operational criteria should be used to measure against the production system. Monitoring and feedback include the exchange of information between the project team members and analysis of user feedback. There should be an early proof of success to manage project. Reporting should be emphasized with custom report development, report generator use and user training in reporting applications (Sumner, 1999).

Project implementation are generally takes various stages. The first stage is usually project initiation where the project is identified and a feasibility study carried out to establish the viability and build a business case. The second stage is the project planning stage and in here the project design is carried out, resources and finances allocated. Project execution which is the third phase

involves implementing the designs within the allocated resources in the set duration and to the set specification and quality. Project closure involves handing over the final product to the customer, handing over the as is built drawings, giving the operation and maintenance plan, terminating the contracts and informing all stakeholders that the project is closed. If project completion date has been frozen without arranging inputs and proper planning, this can lead to hasty and unsystematic work towards the end of the project (JHA et al., 2006). Failure to clearly comprehend the project, all its aspects can lead to works being executed erroneously and the attendant correctional steps to remedy the errors will cause project delay. The consequences are actually 14 grave, ranging from litigation to claims and disputes, to outright abandonment of the project (Olatunji, 2010). When a project delay can no longer be absorbed by the client, the project is abandoned. It helps then to predict and identify problems in the early stages of construction (Hussin and Omran, 2011). Planning stage is therefore very key to success of construction project. Delivery of materials on site will quite affect the project progress. If that supply does not ensure that quality materials are delivered on site then it will cause delay of project completion (Wambugu, 2013). This is because material not meeting the quality of design will most likely be rejected and the process of getting the right material will be taking more project implementation time. When materials are lacking on site it means that the employees will not have work to do. This is quite demoralizing and will affect the project delivery negatively. This is largely a product of poor planning in the construction project. Indeed material availability is the most frequent problem that leads to delay in majority of the countries as identified by Olatunji (2010). Second to this is inadequate planning methods and ineffective coordination of resources. Failure at the conceptual planning and design stages, Inadequate resource and finance allocation, inadequate estimation of project completion schedule , lack of complete and

proper design and specification of projects at right time may lead to significant problems in the successive stages of the project. Koushki *et al.* (2005) in a study carried in Kuwaiti illustrates that owner who carried out pre-planning phase prior to the commencement of the planning phase experienced shorter time delays than their counterparts who did not. The amount of time delay also increased with an increase in pre-planning time period. Sambasivan and Soon (2007) identify contractor's improper planning as one of the causes of project delay. If a contractor fails to come up with a workable work program at the initial stages, this will affect project timely completion. A similar observation is made by Jagboro and Aibinu, (2002) in Nigeria. Equally emphasizing on the need for proper planning of construction project is (Pakir *et al.*, 2012) in a study carried out in Sudan. McMinimee *et al.* (2009) stated that it was clear that investments in advance planning and project development paid off. Mojahed (2005) states that proper planning in all phases and components of construction project are necessary to avoid rework which in turn leads to delay in project completion.

Wideman (2001) concludes that the success of the execution phase of the project is highly dependent upon the quality of planning in the prior planning phase. Wambugu (2013) observes that planning affected the timely completion of rural electrification projects in Kenya and that the 15 qualities and importance of project planning had been considered a major cornerstone of every successful project. Tabishl and Jha (2011) in a study carried out in Singapore conclude that comprehensive site investigation helps in sound planning which in turn helps in clarifying the scope and developing a thorough understanding. This also helps minimize change of scope during construction.

2.3 Project implementation and completion of projects

Projects are influenced by a multiple of factors which can be external or internal to the organization responsible for its management and execution. These include poor project management, inadequate opportunities for potential beneficiaries to participate in project identification and design, poor linkages between project activities and project purpose, insufficient attention to external environment during project design, among others. It has also been recognized that projects were likely to succeed when account was taken of socio-economic context in which they operated (Batten, 1957).

According to Theodore (2009) the causes of delay are categorized into 7 groups. The first group has discussed the causes of delay occurred by client. Those are poor communication and coordination, delay in progress payments by owner, change orders by owner during construction, slowness in decision making process, delay to furnish and deliver the site, late in revising and approving design documents, delay in approving shop drawing and sample materials, Suspension of work, and conflicts between joint-ownership of the project. Second group categories of causes is delay occurred by contractor. Those are: difficulties in financing project by contractor, conflicts in sub-contractors schedule in execution of project, rework due to errors during construction, conflicts between contractor and other parties (consultant and owner), poor communication and coordination, ineffective planning and scheduling of project, improper construction methods implement, delays in sub-contractors work, inadequate contractor's work, frequent change of sub-contractors, poor qualification of the contractor's technical staff, and delays in site mobilization

The third group causes of delay is delays occurred by consultant. Those are: delay in approving major changes in the scope of work, poor communication and coordination, inadequate experience of consultant, mistakes and discrepancies in design documents, delays in producing design documents, unclear and inadequate details in drawings, insufficient data collection and survey before design, and un-use of advanced engineering design software. Fourth group causes of delay is delay occurred by materials. Those are: shortage of construction materials in market, changes in material types and specifications during construction, delay in material delivery, delay in manufacturing special building materials, and late procurement of materials.

The fifth group identified as causes of delay is delays occurred by equipment. Those are: equipment breakdowns, shortage of equipment, low level of equipment-operator's skill, low productivity and efficiency of equipment, and lack of high-technology mechanical equipment. The six group identified as causes of delay is delays occurred by labor. Those are: Shortage of labors, working permit of labors, low productivity level of labors, and personal conflicts among labors. The final group identified as causes of delay is delays occurred by external factors. Those are: effects of subsurface conditions (e.g. soil, high water table, etc.), delay in obtaining permits from municipality, hot weather effects on construction activities, traffic control and restriction at job site, accident during construction, changes in government regulations and laws, delay in providing services from utilities (such as water, electricity), and delay in performing final inspection and certification by a third party.

A study conducted in Korean, the causes of delay in mega projects are classified into five categories: insufficient planning, difficulties in acquiring right of way, inefficiency of project management and monitoring system, conflicts between organizations, and strong public resistance. All of the direct or indirect

participants tend to maintain different interests in the same project, making it extremely difficult to properly align them for project success. The sheer size and complexity of the project can easily lead to inefficiency and low productivity. Even though these causes, normally found in Korean mega projects, can be repetitive in any construction project, they tend to bring poorer results than those of smaller projects in both size and complexity (Han *et al.*, 2009).

Likewise, Al-Momani (2000) conducted a quantitative analysis of construction delays by examining the records of 130 public building projects constructed in Jordan during the period of 1990-1997. The researcher presented regression models of the relationship between actual and planned project duration for different types of building facilities. The analysis also included the reported frequencies of time extensions for the different causes of delays. The researcher concluded that the main causes of delay in construction projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions, and increase in quantities. Moreover, Assaf *et al.* (1995) for example, provide a concise summary of the methodologies used by transportation agencies to establish the contract duration used for highway construction projects, and also provide a schedule guide for field engineers during construction. Similarly, Mohammed & Isah (2012) conducted a review on project delays in developing countries during planning and construction stages. In their study they found that the delay and cost overruns of construction projects are dependent on the very early stages of the project.

2.4 Monitoring, Evaluation, and Controlling system and completion of projects

The competence of the project manager during project implementation will also affect the timely completion of a project. Positive attitude of project manager and project participants has emerged to be the most important success attribute for quality compliances at project sites (JHA & IYER, 2006). The authors additionally observed that some of the attributes are with high importance are all related to the project manager. For example effective monitoring and feedback by the project manager, project managers technical capability, leadership quality of the project manager, effective monitoring and feedback by the project team members and authority to take day to day decisions by the project managers' team at site. Furthermore, the success of project hinges on the efficacy of the project team in managing the process (Olatunji, 2010). This indicates adequate capacity of the project manager as well as the project team to ensure proper inspection and investigation of work done on site. A weak link in the process such as a lack of project management experience, could adversely affect timely execution/ timely completion of the projects (Dainty *et al.*, 2003) as cited by Olatunji (2010). When there is no proper inspection/supervision, quality control is greatly compromised. Chism and Armstrong (2010) agree by stating that inspection and workmanship standards are quite important to achieve quality. Fapohunda and Stephenson, (2010) state that to achieve the pre-determined project objectives, the construction site manager should have a significant influence over cost, time, scope and quality which make it paramount for the manager to have ability of exercising authoritative and absolute control.

Wambugu (2013) concluded in a study that inadequate supervision and inspection of work in construction project led to rework in instances of poor

workmanship and this led to delay in project timely completion. This also leads to project cost overrun and may result to project abandonment. Inadequate site inspection is one of the factors identified as causing project delays 16 in timely completions according to (Jagboro & Aibinu, 2002). Mojahed (2005) states that occasion of rework are mainly attributed to incompetent craftsmen because of insufficient working skills and knowledge of drawings or to incompetent supervisors because of lack of experience leading to deficient supervision. The study clearly emphasized the impact of management and supervision on the overall success of the construction project. If there is no proper supervision, workers will tend to take break whenever they desire and work will tend to delay. Timely inspection is of great importance to ensure effective operation, material quality, and timely progress of the project schedule. Subsequent activities on a construction schedule may not be carried out before the required inspection is carried out on the preceding activities. Chai and Yusof (2013) identify poor site management and supervision as ranking high in the order of causes of construction project delay.

2.5 Communication in project teams and completion of projects

Communication plays an important role in leading, integrating people, and taking decisions to make a project a success. There must be shared project vision, where the project manager identifies the interests of all relevant stakeholders and ensures that there is buy in to the project (Yang *et al.*, 2009). According to (Zwikael 2009) once the project objectives are set and the scope clarified, there must be constant update as the project progresses. Progress on activities assigned to individuals or groups needs to be monitored with a view to achieving overall goals. These updates must be communicated to the relevant parties. Newton (2005) believes that a detailed communication plan is necessary for the effective dissemination of information. To this end, frequent

project meetings are necessary. Apart from consulting with the community, local direct involvement is a key element for project success. Given the relatively high unemployment rates in South Africa, consideration must be given to local residents. This could include sourcing materials from local suppliers and employing local residents. It is advisable to use an influential community member as a liaison between the project manager and the community (Teo, 2010). Finally, proper handover procedures need to be developed. This is an important consideration, given that the construction industry is being increasingly viewed as a service industry (Karna *et al.*, 2009)

Project communication management ensures timely and appropriate generation, collection, dissemination, storage, and disposition of project information. Open and clear communications are required among planners, implementers, and all levels of the organization for project success. It includes having a communication plan, information distribution path, progress reporting, and information sharing system for management and customers (Kwak & Ibbs, 2002). Project communication management should also include methods and techniques to build trust and relationships among team members, as well as propagate desirable personal behaviors and clear communication rules.

Findings indicate that, in case of many projects, activities in the field of communication management are disordered, supported mainly by project managers' intuition or neglected (Paasivaara & Lassenius, 2003; Adera, 2013). Research on project communication management in industrial enterprises in Slovakia revealed that in 66% of them no written document (methodology, process steps) to manage project communication has been prepared (Samakova *et al.*, 2013).

2.6 Project closure and completion of projects

Project delivery system will also affect project timely completion or not. Project delivery system refers to the various processes required in materializing the goals and objective of a client into a project through integrated project team efforts (Chen *et al.*, 2011) the same authors also state that the project delivery system acts as a management function of the owner in project execution. It is quite important that the right choice on the project delivery system is made. The decision made in the selection of the project delivery system for a project impacts all phases of execution of the project and greatly impacts the efficiency of project execution (Oyetunji & Anderson, 2006). The choice of the project delivery system largely depends on the funding available. A funding agency will most likely determine the project delivery system that will be able to guarantee the cost control and in the end the project control. This choice is based on past practices, traditions and experiences, advice of consultants, funding sources and constraints. Other project stakeholders' views will also be factored. When the project is closed, ensure that any outstanding tasks in the project plan that are to continue after the project is closed are included in the formal project close tasks which are addressed in the Close phase. These outstanding tasks may need to be included in post-project implementation planning and may have an impact on the business outcomes and benefits realization from the project.

However in a case where the owner needs professional design services and construction services, design bid build may be the preferred option. Design Bid Build (DBB) gives the owner a high degree of control. The owner can also closely monitor projects. It is also applicable if the owners are public owners and must account in detail for expenditures. The manager uses procedures that will guide on how best the resources will be best used during the construction

process with the aim of achieving timely and efficient application in the construction process. Wambugu (2013) avers that a construction manager will generally be trained in the management of construction processes. Yet another project delivery system is the Design Build (DB). In this type the owner contracts a single entity to provide the design and implement the design. This system enables the owner to deal with a single contact and so eliminate the various conflicts that occur when a team of consultants in design team on one hand differ with the contractor on the other hand. In DB the design builder makes many of the decisions that the owner would otherwise be required to make in DBB. There is therefore a quite delegated authority by the owner. There are variations in the type of design build arrangements. They may be lease develop operate where the owner gives the operator a long term lease to develop, operate and then revert to the owner. Public private partnership is another arrangement for project implementation where a public sector authority enters into a contract with a private party. The private party provides a public service or project and assumes a substantial financial, technical and operational risk in the project. In a typical case a private sector consortium forms a special company vehicle called “a special purpose vehicle” (SPV) to develop, maintain and operate the asset in the contracted period. The PSV then signs the contract with the public entity and then signs a contract with sub-contractors to construct the project and then maintain it.

Turnkey contracts or engineer procure construct projects. In these contracts, the owner prepares the principle and basic design of the construction on a functional basis (FIDIC, 1999). The owner exercises limited control over and should in general not interfere with the contractors work. A feature of this type of contract is that the contractor has to prove the reliability of the project after completion at the turn of the key (FIDIC, 1999).

2.7. Research Hypotheses

Based on reviewed literature the research hypothesis was identified as follows:

H1: Poor project initiation is expected to have significant negative impact on project completion.

H2: Poor project planning/design is expected to have significant negative impact on project completion.

H3: Improper implementation is expected to have significant negative impact on project completion.

H4: Poor project monitoring, evaluation and controlling system is expected to have significant negative impact on project completion.

H5: Poor communication is expected to affect project completion negatively.

H6: Improper project closure is expected to affect project completion negatively.

3. RESEARCH METHODOLOGY

3.1. Research Approach and Design

The study intends to assess the determinants of project implementation delay of the case bank. The cause and effects (causal) relationship between variables are assessed throughout the study. This makes it appropriate for the study to implement explanatory research design. In this study both qualitative and quantitative data types were collected. This leads for the study to use a mixed research approach which combines both qualitative and quantitative research methods.

3.2. Study Population and Sampling

DBE is a project-based lending institution. Projects financed by the Bank are carefully selected and prepared through appraised, and they are closely supervised and systematically evaluated. In this study, the population are

industrial projects financed by the head office (corporate level). The head office is engage in financing mega project. The study considered project financed by the Bank between January 2012 and December 2014. The total number of project financed for during the mentioned period were 232. From these only 50 projects were completed successfully on scheduled time and the remaining 182 projects experienced delays in their implementation. However, even if the implementation delay occurred in project financed by DBE, the time of delay is different from project to project. Therefore, the total population of the study are 182 projects with their time of delay since the bank schedule project implementation time on monthly based. It is very expensive in terms of money and time to collect data from these entire projects or contacts. Sekarar (2003) presented a simplified formula to calculate sample sizes of finite population. A 95% confidence level is assumed for this formula to determine the sample size, at $e=0.05$ and the sample size for the study is determined as follows:

$$n = \frac{N}{1 + N(e)^2}$$

where 'n' is the required sample size,

N is the population size and

E is the level of percision

Applying the above formula, $n = \frac{182}{1 + 182(0.05)^2} = 125.085 = 125$ rounding to nearest integer. Hence the sample size for this research included 125 projects financed by Development Bank of Ethiopia. Therefore, the project managers of 125 projects are considered to be the population of the study.

3.3. Data Type and Source

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 manager who are selected from the project financed by case bank. The

secondary data was used (referred) from project file or recorded documents by case bank.

3.4. Data Collection Instruments and Data Collection Procedure

The instrument of data collection employed was a questionnaire. The questionnaire has part I giving the background information of the respondent. They were also requested to state Company/Project currently you manage. Part II ranking of determinants mentioned based on their contribution in project delay. Part III of the questionnaire sought the data on previous projects that the respondent had handled. The specific data asked included project initiation, project planning/Design system, implementation, project monitoring, and evaluation and controlling system, communication, project closure related issues. Also asked was the reason for each project delay. A last question sought the respondents' personal opinion on the cause of projects completed delay.

Because of the pre-determined sample population and the nature of the study, the sampling methodology used was non-probability. Purposive or judgmental sampling and snow-balling sampling methodologies were therefore applied in this study. The sampling procedure was also guided by the records available on the registered professionals in the construction industry who formed the population. The identified project managers were issued with the questionnaire. When they recommend fellow project managers that the researcher could give questionnaires they were further requested to fill the research questionnaire.

3.5. Data Analysis Method

After collecting data from primary sources it was appropriately checked. In addition to that in-house editing was made by the researcher to detect errors committed by respondents during completing the questionnaires. Then the edited data was coded and manually enter in to the computer. In the study both qualitative and quantitative methods of data analysis techniques was employed.

Analysis of data in this research was done by using statistical tools like correlation and multiple regressions. In the study six hypotheses were analyzed using methods of statistical inference. Multiple regression analyses were also conducted to determine by how much percent the independent variable i.e. delay factors explain the dependent variable which is project implementation delay. Tables were employed to present the data and statistical package for social science (SPSS) version 24 were used to support the analysis.

4. RESULT AND DISCUSSION

4.1. Ranking of Delay Factors

Table 1 shows the ranking of the delay factors based on the mean values. The factors with mean values exceeding 3.8 present a fairly high agreement of the respondents. Based on the ranking, the three most influential factors of project completion are: Poor Project Initiation (PPI) (mean = 3.847); Poor Project Monitoring, Evaluation and Controlling System (PPMECS) (mean = 3.661); and Poor Project Planning/Design System (PPPDS) (mean = 3.657). It is easy to find that PPI is the factor having the highest value of the means. The information delays and lack of information exchange between the parties are serious problems when the project is running and encountering with deadline or important milestones. These problems lead to the different understanding about the project objectives between the parties. Conflicts can occur when the information is not updated in time to one of the parties. The old information could be done by the contractor. Completed works could not meet the owner's requirements, also caused schedule delays and cost overruns. The two factors that have the lowest means with comparing to other factors are: (IPC) improper project closure (mean = 3.592), and (II) improper implementation (mean = 3.567).

Table 1: Ranking of Delay Factors

Code	The Delay Factors	Mean	Rank
PPI	Poor project initiation	3.847	1
PPMECS	Poor project monitoring, evaluation and controlling system	3.661	2
PPPDS	Poor project planning/Design system	3.657	3
PC	Poor communication	3.616	4
IPC	Improper project closure	3.592	5
II	Improper implementation	3.567	6

Source: Author's survey result

4.2. Relationship between Project Implementation Delay Factors and Project Delay

The regression analysis was conducted to know by how much the independent variable explains the dependent variable. In this study, regression was employed to examine the effect of the independent delay factors such as poor project initiation, poor project planning/design system, improper implementation, poor project monitoring, evaluation and controlling system, poor communication and improper project closure on dependent variable project delay. The model was checked for multicollinearity problem using VIF (Variance Inflation Factor). According to Pallant (2007), the inverse of tolerance value should have a value of less than 10 to avoid any concerns of co-linearity. Hence, the values in the Table 2 indicated low co-linearity.

The multiple regression analysis model the relationship between the independent variable and dependent variable. The coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between the two. The results of the adjusted $R^2=0.943$ indicates that there is a positive relationship between independent variable (and dependent variable (project delay)). Further, it can be argued that poor project initiation, poor project planning/design system; poor project monitoring, evaluation and controlling

system, poor communication and Improper project closure jointly determine (explain) 94.3% of the variance in project delay. Whereas 5.7% of the project implementation delay/project completion delay was explained by the variables which were not included in the study.

Table 2: Determinants of Project Implementation Delay (n=125)

Variables	Unstand. Coeff.		Stand. Coeff.	t	Collinearity Statistics	
	B	Std. Err.	Beta		Tolerance	VIF
Constant	1.35***	0.10		13.44		
Poor project initiation	0.24***	0.04	0.24	5.93	0.29	3.41
Poor project planning /design	0.18**	0.03	0.07	2.12	0.49	2.03
Poor project monitoring, evaluation and controlling system	0.47***	0.04	0.55	10.85	0.12	5.38
Poor communication	0.36***	0.04	0.47	10.21	0.23	4.33
Improper project closure	0.14***	0.03	0.17	4.47	0.33	3.0

***Significant at $p < 0.01$ and **Significant at $p < 0.05$

Source: Author's survey result

The values of the unstandardized Beta Coefficients (β) indicate the effects of each independent variable on dependent variable. Furthermore, the values of the unstandardized Beta Coefficients in the Beta column of the Table 4.10 above, indicate which independent variable (determinants of delay) makes the strongest contribution to explain the dependent variable (project delay), when the variance explained by all other independent variables in the model is controlled. The t value and the sig (p) value indicate whether the independent variable is significantly contributing to the prediction of the dependent variable.

The study's hypothesis testing was made based on β , t , and P values. Hence using those coefficient results, the proposed hypotheses for this study were tested as follows.

Hypothesis 1: Poor project initiation and project completion

The results of multiple regressions, as presented in Table 2 revealed that poor project initiation had a positive and significant effect on project delay with ($\beta = 0.235$, $t = 5.934$ & $p < 0.01$). Thus, the proposed hypothesis was accepted. This statistics infer that if the owner of the project increased its focus to project initiation by one %, then its project delay would decreased by 23.5%. Therefore, poor project initiation had a negatively affect the project completion time. The findings agree with Chan and Kumaraswamy (1997) who argues that the factor that always happen relate to the poor project initiation are: improper define the project scope, lack recruit appropriate staff, unforeseen ground conditions, low speed of decision making involving all the project team, poor job description for a project manager, lack of comprehensiveness of feasibility study and Analysis.

Hypothesis 2: Poor project planning/design and project completion

The results of multiple regressions, as presented in Table 4.5 above, revealed that poor project planning/design had a positive and significant effect on project delay with values ($\beta = 0.176$, $t = 2.199$, $p < 0.01$). Thus, the proposed hypothesis was accepted. Here also the beta coefficient implies that if the attention is given to poor project planning/design by one %, by keeping the other variables constant its project delay would decreased by 17.6%. Therefore, poor project planning/design had a negatively affect the project completion time. The findings concur with Olatunji (2010), Wambugu (2013) and

Sambasivan & Soon (2007) that points out the factors always happen relate to poor project planning/design are; inadequate resource and finance allocation, inadequate estimation of project completion schedule, lack of complete and proper design and specification of projects at right time, contractors improper planning.

Hypothesis 3: Poor project monitoring, evaluation and controlling system and project completion

The results of multiple regressions, as presented in Table 2 revealed that poor project monitoring, evaluation and controlling system had a positive and significant effect on project completion with values ($\beta = 0.469$, $t = 10.854$, $p < 0.01$). Thus, proposed hypothesis was accepted. In this case the beta coefficient describe that keeping the other variables constant, in this model a one % change in the overall project monitoring, evaluation and controlling system, the consequence would be made change time in project completion by 46.9 %. Therefore, poor project monitoring, evaluation and controlling system had a negatively and significant effect on project completion. The findings concur with Chism and Armstrong (2010) and Kwak & Ibbs (2002) that points out the factors always happen relate to poor project monitoring, evaluation and controlling system are; no proper inspection/supervision, poor quality control, inadequate supervision and inspection of work, inadequate site inspection, lack of effective monitoring and feedback.

Hypothesis 4: Poor communication and project completion

The results of multiple regressions, as presented in Table 4.5 above, revealed that poor communication had a positive and significant effect on project

completion with values ($\beta=0.361$, $t = 10.212$, $p < 0 .01$). Thus, the proposed hypothesis was accepted. Here also the beta coefficient implies that if communication is changed by one %, by keeping the other variables constant its project completion would increase by 36.1%. Therefore, poor communication had a negatively and significant effect on project completion. This finding is also supported findings of by (Bilczynska and Wojcik, 2014 and Kwak & Ibbs, 2002) in which identified that distance and lack of face-to-face communication, lack of common rules, misinterpretation of written text, lack of communication expectations, lack of communication plan, information distribution path, progress reporting, and information sharing system for management have a negatively and significant influence on project completion time.

Hypothesis 5: Improper project closure and project completion

The results of multiple regressions, as presented in Table 4.5 above, revealed that improper project closure had a positive and significant effect on project completion with values ($\beta=0.140$, $t = 4.466$, $p < 0 .01$). Thus, the proposed hypothesis was accepted. Here also the beta coefficient implies that if the project closures improper differ by one %, by keeping the other variables constant its project delay would increase by 14%. Therefore, improper project closure had a negatively and significant effect on project completion. The findings concur with Oyetunji and Anderson (2006) that points out the factors always happen relate to improper project closure are inadequate project delivery system and incomplete a post implementation review.

Generally the results of multiple regression analysis supported the six hypotheses constructed to test a positive and significant influence that each determinants have on project delay.

4. CONCLUSION AND RECOMMENDATIONS

The study concludes that poor project initiation, poor project planning/design system, poor project monitoring, and evaluation and controlling system, poor communication and improper project closure was affect the project completion negatively. This is in line with past findings (see for example, Chan and Kumaraswamy 1997; Wambugu, 2013; Theodore, 2009; Dainty *et al.*, 2003; Bilczynska and Wojcik, 2014; Oyetunji and Anderson, 2006). Lack of project planning/design system seems to be the main constraint which project completion. It has also shown that improper implementation; the constraints of building materials, labor, and construction equipment's have been unable to provide adequate funding to a reasonable and affordable standard schedule time.

The results of this study revealed that poor project initiation, poor project planning/design system, poor project monitoring, and evaluation and controlling system, poor communication and improper project closure negatively influences project completion. Hence, it can be concluded that project completion time scheduled was affected due to poor project initiation, poor project planning/design system, poor project monitoring, and evaluation and controlling system, poor communication and improper project closure negatively. Regarding the relative influence of an individual component of delay factors on project completion is concerned; the result of multiple regression coefficient shows that poor project initiation is the most dominant factors in determining the project completion. The study also concludes that the practices that lead to reduction in delay on implementation of projects financed

by DBE are use of efficient project-specific activate, assigning well trained workers for specific tasks, good project planning and controlling, conflict resolution during project implementation, establishment of good governance, good public accountability, management and good forecasting of work plan, estimation project duration, assigning specific tasks to project teams and also assigning projects to specific teams. Aligned with the above conclusion, the researcher proposes the following corrective measures that should be considered by concerned stake holders in order to reduce project implementation delay regarding DBE financed projects. These include:

- ❖ As finding of the study shows poor project initiation is the most determinants of project delay so that any business initiators should select project those are more familiar and interesting for them and scope of project should be established, controlled and must be clearly defined and be limited. This includes the amount of the systems implemented and amount of projects process reengineering needed.
- ❖ As far as planning/design system, monitoring, and evaluation and controlling system, communication and project closure should be improved to have basic indicators for project implementation as opposed to the current practice where mostly observation and project manager appointed staff are solely relied on to certify a project as duly completed. In addition an individual or group of people who participate in those activities should be given responsibility to drive success in project implementation.
- ❖ Further, there should be stringent monitoring and evaluation at all stages of project implementation including concept and design stages, thorough project feasibility studies, formulation of appropriate planning, monitoring of procurement process, adequate and proper design of projects, proper specialization of duties, tasks and

responsibilities, transparency and accountability of workers, proper closure of project and capacity building for staff.

- ❖ As far as those deterrents are identified as factors for project delay the lending bank and project owners should be committed to improve the deficiency and to enhance the project completion against its time schedule.

REFERENCES

- Abebe D. (2003). Construction Management and Finance, Addis Ababa University Press, Addis Ababa, Ethiopia.
- Abdalla M. O. & T B. Hussien (2002). Causes of construction delay: Traditional contracts. *International Journal of Project Management*, 20(1): 67-73.
- Ahmed, S., S. Azher, M. Castillo & P. Kappagantula (2002). Construction delays in Florida: An empirical study. Available at: https://www.researchgate.net/profile/Salman_Azhar3/publication/228584635_Construction_Delays_in_Florida_An_Empirical_Study/links/53f3f2830cf256ab87b79be6.pdf
- Aibinu A.A & G.O. Jagboro (2002). Effects of construction delays on project delivery in Nigerian construction industry. *International Journal of Project Management*, 20(8):593-599.
- Agaba E. (2009). Poor Planning Delaying Government Projects (Business News Pullout), the New Vision, 24: 6.
- Al-Momani H.A. (2000). Construction delay: A quantitative analysis. *International Journal of Project Management*, 18(1):51-9.
- Ashley, D.B., S. C. Lurie & J. E. Jaselskis (2008). Determinants of construction project success. *Project Management Journal*, 18(2). 69-79.
- Assaf, S.A., M. Al-Khalil, & M. Al-Hazmi (1995). Causes of delay in large building construction projects. *Journal of Management in Engineering*, 11 (2): 45-50.
- Assaf, S. A. & S. Al-Hejji (2006). Causes of delay in large construction projects. *International journal of project managements*, 24(4): 349-357.
- Chai, S.C. & A.M. Yusof (2013). Reclassifying Housing delivery Delay Classification. *International Journal of Business Management*, 8 (22): 107-117.

- Chism, N., & G. Armstrong (2010). Project delivery strategy getting it right. KPMG International, pp.1-24.
- Development Bank of Ethiopia (2006). Risk Management process: Report on Loan Recovery Performance of the bank, Addis Abab, Ethiopia.
- Fangel M. (1998). Best Practice of Project Start-up. In: Proceedings of the 14th World Congress on Project Management, IPMA, Ljubliana project, 354-361.
- Fapohunda J.A & P. Stephenson (2010). Optimal construction resources utilization: Reflections of site managers' attributes. *Pacific Journal of Science and Technology*, 11(2) 353-365.
- Geraldine J. K. (2012). Causes and Effects of Delays and Disruptions in Construction Projects in Tanzania. Ardhi University, Tanzania. Available at:
<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.844.5717&rep=rep1&type=pdf>
- Jha K.N. & K.C. Iyer (2006). Critical Factors Affecting Quality Performance in Construction Projects. *Total Quality Management*, 17(9): 1155–1170.
- Kouklakis, P.A. & N. Karta (2004). Impact of construction materials on project time and cost in Kuwait. *Journal of Construction and Architectural management*, 11(2):126-132
- Koushki P. A., K. Al-Rashid & N. Kartam (2005). Delays and cost increases in the construction of private residential projects in Kuwait. *Construction Management and Economics*, 23(3):285–294.
- Komi S. S. & M. Tihinen (2005), Lessons learned by participants of distributed software development. *Knowledge and Process Management*, 12(2): 108-122.
- Kraiema Z.M. & J.E. Dieknam (1987). Concurrent Delays in construction project. *Journal of Construction Engineering and Management*, 113(4): 591-602.
- Kwak Y. H. & C.W. Ibbs (2002). Project management process maturity (PM) 2 model. *Journal of Management in Engineering*, 18(3): 150-155.
- Kumaraswamy, M. M. & D.W.M. Chan (1995). Determinants of construction duration. *Construction Management and Economics*, 13(3): 209-217.
- Le-Hoai L., Y.D. Lee & J.D. Lee (2008). Delay and cost overruns in Vietnam large construction projects: A comparison with Other Selected Countries. *KSCCE Journal of Civil Engineering*, 12(6):367–377.

- Lee S., & F. Pena-Mora (2007). Understanding and managing iterative error and change cycles in construction. *SYSTEM DYNAMICS REVIEW*, 23(1): 35-60.
- Manavazhia M.R. & D.K. Adhikarib (2002). Material and equipment procurement delays in highway projects in Nepal. *International Journal of Project Management*, 20:627-32.
- Mengistu B. (2010). Project Management Practices. The case of EECMY-DASSC focusing on planning, scheduling and controlling phase. MBA Thesis Submitted to Unity University, Ethiopia.
- Mohammed A.K. & A.D. Isah (2012). Causes of delay in Nigeria construction industry. *Interdisciplinary Journal of Contemporary research in business*, 4(2): 785-794.
- Mojahed, S. (2005). A project improvement system for effective management of construction projects. Master's Thesis Submitted to Louisiana State University, Louisiana, USA.
- Ndekugri, I., N. Braimah & R. Gameson (2008). Delay Analysis within Construction Contracting Organizations. *Journal of Construction Engineering and Management*, 134(9):692-700.
- Odeh, A.M., & H.T. Battaineh (2002). Causes of construction delay: Traditional contracts. *International Journal of Project Management*, 20: 67-73.
- Paasivaara, M. & C. Lassenius (2003). Collaboration practices in global inter-organizational software development projects. *Software Process: Improvement and Practice*, 8(4): 183-199.
- Samáková, J., J. Šujanová & K. Koltnerová (2013). Project Communication Management in Industrial Enterprises. In: P. Lech (Ed.), Proceedings of the 7th European Conference on Information Management and Evaluation (pp. 155-163). United Kingdom.
- Sambasivan M. & Y.W. Soon (2007). Causes and Effects of Delays in Malaysian Construction Industry. *International Journal of Project management*, 25 (5): 517-526
- Sumner, M. (2009). Critical success factors in project wide information management systems projects. Proceedings of the Americas Conference on Information Systems (AMCIS) Pp.232-4
- Tabishl S. Z. S. & K.N. Jha (2011). Important Factors for Success of Public Construction Projects. A paper presented at the 2nd International

- Conference on Construction and Project Management. September 16-18, Singapore.
- Trauner, T. J., W. A. Manginelli, J. S. Lowe, M. F. Nagata & B. J. Furniss (2009). *Construction Delays: Understanding Them Clearly, Analyzing Them Correctly*. Elsevier Inc., USA.
- Uma S. (2000). *Research methods for business: a skill building approach*. 3rd Ed. New York: John Wiley.
- Wambugu D. M. (2013). Determinant of successful completion of rural electrification projects in Kenya: A case study of Rural Electrification Authority. *International Journal of Social Sciences and Entrepreneurship*, 1(2): 549-560
- Yang, J., Q. Shen & M. Ho (2009). An overview of previous studies in stakeholder management and its implications for the construction industry. *Journal of Facilities Management*, 7(2): 159-175.
- Zinabu T. (2016). Construction Projects Delay and Their Antidotes: The Case of Ethiopian Construction Sector. *International Journal of Business and Economics Research*. 5 (4)113-122.
- Zwikael O. (2009). Critical planning processes in construction projects. *Construction Innovation*, 9(4): 372-387.