Effect of Delay on Profitability of Building Construction Projects

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Abstract- 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. The Indian construction sector has acted as an engine of growth for the Indian economy for over the past five-decades and becoming a basic input for the socio-economic development of the country. Construction is the second largest economic activity after agriculture, and has contributed around 6 to 9% of India's GDP over the past five years while registering 8 to 10% growth per annum. This paper refers to study effect of delay in construction industry particularly in profitability or economic factors.

Keywords: *Construction, Delay, Profitability, GDP, Economic factor*

I. INTRODUCTION

The construction industry is one of the main sectors that provide important ingredients for the development of an economy. The construction industry is the tool through which a society achieves its goals of urban and rural development. However it is becoming more complex because of the sophistication of the construction process itself and the large number of parties involved in the construction process, i.e., clients, users, designers, regulators, contractors, suppliers, subcontractors, and consultants. Modern construction projects are characterized by new standards, advanced technologies, multiparty participation, and frequent owner-desired changes. Coupled with this state are inherent uncertainties and complexities in the physical, financial, and economic environment in which most projects are performed. Such conditions have made completing projects on schedule and on budget a difficult task to accomplish often leading to claims on cost compensations and time extensions. This eventually leads to delay in the completion of the project. Delay could be defined as the time over run either beyond completion date specified in a contract or beyond the date that the parties agree upon for delivery of a project. It is slipping over its planned schedule and is considered as common problem in construction projects. Delay in construction project is considered one of the most common problems causing a multitude negative effect on the project and its participating parties.

II. CAUSES OF DELAY IN CONSTRUCTION

The causes of delays where categorized into eight related groups namely:

- Project group
- Owner group
- Materials and equipment group
- Laborers group
- External group
- Design group
- Contractor group
- Consultant group

The causes where ranked and recommendations to reduce time overrun in road construction where given to the government, owners, contractors, and consultants. Finally, the literature concluded with determining top five severe causes of delay as seen from the combined view of contractors and consultants. They are as follows:

- Political situation
- Segmentation
- Award project to lowest bid price
- Progress payments delay by owner; and
- Shortage of equipments

Conversely, the bottom five causes of delay as seen from the combined view of contractors and consultants are:

- Poor ground conditions
- Insufficient inspectors
- Inappropriate design
- Monopoly; and
- Natural disaster

The study identified ten most important causes of delay from a list of 28 different causes. Ten most important causes of delay were:

- Contractor's improper planning
- Contractor's poor site management
- Inadequate contractor experience
- Inadequate client's finance and payments for completed work
- Problems with subcontractors
- Shortage in material
- Labor supply
- Equipment availability and failure
- Lack of communication between parties
- Mistakes during the construction stage

A survey of contractors, owners, and architects/engineers was conducted on the causes of delay factors in large building projects in Saudi Arabia. The survey showed that all three groups generally agree on the ranking of individual delay factors. The factors were categorized into nine major groups and were ranked. The nine groups were material, manpower, equipment, financing, changes, government relations, scheduling and controlling, environment, and contractual relationships. Based on the contractors surveyed, the most important delay factors were:

- Preparation and approval of shop
- drawings
- Delays in contractor's progress
- Payment by owners and
- Design changes

III. REVIEW OF RESEARCH PAPER

Sadi A. Assaf, Sadiq Al-Hejji (2006), A survey on time performance of different types of construction projects in Saudi Arabia was conducted to determine the causes of delay and their importance according to each of the project participants, i.e., the owner, consultant and the contractor. The field survey conducted included 23 contractors, 19 consultants, and 15 owners. Seventy-three causes of delay were identified during the research. 76% of the contractors and 56% of the consultants indicated that average of time overrun is between 10% and 30% of the original duration. The most common cause of delay identified by all the three parties is change order. Surveys concluded that 70% of projects experienced time overrun and found that 45 out of 76 projects considered were delayed.

G. Sweis, R. Sweis, A. Abu Hammad, A. Shboul (2008), The construction industry is a major player in the economy, generating both, employment and wealth. However many projects experience extensive delays and thereby exceed initial time and cost estimates. A host of causes of construction delays in residential projects were identified and classified according to Drewin's Open Conversion System. The most common causes were evaluated by using both, the data collected in a survey conducted to residential projects consultant engineers, contractors, and owners, and interviews with senior professionals in the field. Most correspondents agreed that, financial difficulties faced by the contractor and too many change orders by the owner are the leading causes of construction delay. Severe weather conditions and changes in government regulations and

laws ranked among the least important causes. The findings of this research are discussed below emphasizing the most important delay causes according to Drewin's Open Conversion System. In addition, the discussion will emphasize the relation between the research findings and other comparable research in the field.

N. Hamzah, M.A. Khoiry, I. Arshad, N. M. Tawil and A. I. Che Ani (2011), Delay can be defined as time overrun or extension of time to complete the project. Construction delay is something that cannot avoided especially in government agencies in Malaysia. Therefore delay is a situation when the actual progress of a construction project is slower than the planned schedule or late completion of the projects. The causes of delay are taken from the pass literature review. There are two main type of delay: excusable delay and non excusable delay. The literature reviews are summarized and the delay framework is constructed based on the literature review summary in context of public higher learning institution.

Hemanta Doloi, Anil Sawhneyb, K.C. Iyer, Sameer Rentala (2012), Construction projects in India are experiencing widespread delays. Due to a dramatic shift in the capacity and volume of the Indian construction sector over the last decade, the need of a systematic analysis of the reasons of delays and developing a clear understanding among the industry professionals are highly crucial. Using a selected set of 45 attributes, this research first identified the key factors impacting delay in Indian construction industry and then established the relationship between the critical attributes for developing prediction models for assessing the impacts of these factors on delay.

Berrak Bahadir, Olena Mykhaylova (2014), Housing supply is subject to several types of delays. On average, it takes 6 months to get approved for a residential building permit and another 2–4 quarters to complete a construction project. We present a simple two-sector model that incorporates these observations and show that the effect of these delays is not uniform: while they amplify the response of house prices to demand shocks, they dampen the effects of housing supply shocks. Moreover, construction activity depends on the relative duration of the shocks and the construction delays: delays dampen construction booms following temporary shocks, but exaggerate building activity following permanent changes in demand or supply conditions. Our results highlight the importance of capturing the nature and the persistence of the shocks when studying the effects of construction sector delays on housing market dynamics.

Alfredo Serpell, José Ignacio Díaz (2016), As shown in the literature, numerous studies have been performed about ways to improve the performance of construction operations and, as a result, numerous interventions have been realized with this purpose, though many of them have only produced very reduced impact on site performance. It is stated here that one of the reasons of the mentioned results is the fact that the focus for those interventions has been put mainly at the site level without looking at the central business level of construction companies. This ongoing study is exploring the relationships between both, the site level and the central business level, and the way in which processes at the central business level of a construction company influence construction operations' performance. The final goal of this research is to find out how central business processes can leverage the worksite production system performance and how can this leverage be strengthened to improve site's production. It is expected that a new structure of requirements for business processes is going to be proposed in order to support a high, long-range on-site construction operational performance effectively.

Majed Alzara, Jacob Kashiwagi, Dean Kashiwagi, Abdulrahman Al-Tassan (2016), Saudi Arabia has been facing issues with completing construction projects on time and on budget. It has been documented that 70% of public construction projects are delayed. A case study was performed at a University campus in northern Saudi Arabia, identifying the major causes of project delays. The University was experiencing delays from 50% to 150%. The delay factors were gathered from the University Projects Director. The University's delay factors were

then compared to delay factors experienced on Saudi construction projects, identified by performing a literature research. The comparison identified nine causes of delays that both studies documented. The study also proposes a solution to minimize the nine major delay factors. Literature research identified one construction management method, the Performance Information Procurement System (PIPS), has documented multiple times its ability to improve project performance and minimize delays.

David Arditi, Shruti Nayak , Atilla Damci (2017), Delay is one of the most common problems in the construction industry. This study aims to explore the relationship between a construction company's organizational culture and delay. A questionnaire survey was administered to construction companies located in the U.S. and India in order to collect data on their organizational culture and the amount of delay that they experienced in their projects. The results of this study show that construction organizations in the U.S. are dominated by clan culture whereas those in India are dominated by market culture. The study also shows that the percentage of delay relative to project duration is lower in the U.S. compared to India.

IV. CONCLUSION

Delay is one of the biggest problems offer experienced on construction project sites. Delay in sites gets negative effect such as increased cost loss of productivity and revenue may low suits between owners and contractors and contract termination. There are many factors that induce delay on construction projects. However in some of identified factor, includes lack of funds of finance the project to completion change in drawings, lack of effective communication. Among the parties involved lack of adequate information from consultants, slow decision making and contractor's insolvency variations among others. Project management problems, mistakes during construction, bad weather, fluctuation in prices of building materials in appropriate overall organizational structure linking to the project and labour are some other main reasons behind delay of project. The study until now was carried out on the causes of delay and inflation of project cost. Many researchers defined different methods for optimizing cost of project after delay. This study will continue with framing a relationship between delay and profitability of the project facing delay problem.

V. REFERENCES

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