Financial Risk Analysis and Its Mitigation on Construction of Residential Building

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Abstract- *This dissertation report presents the work related to the study of delay in construction projects and management. The presented work consists of two main parts. The first part is related to the study of delay that encountered in recent projects and local survey of construction engineering and the second part is related to the construction management study with respect to delay and corrective process with recommendations.*

For the first part of study of delay in construction projects, the papers related to work are collected this papers and related work is helpful in understanding the construction project sand strategy behind the occurrence of delay. The prerequisite basics of the work is recorded also by conducting local survey to get opinions from contractors and engineers which has directed to plan the scope of work and add which is importantly required in terms of management.

Different manipulation is carried out. A questionnaire survey is prepared for local projects. These survey opinions are analyzed for different categories of projects and results are obtained in the form of ranks. For the second part, it consist of entirely as resolution of delay in construction a project which contributes to study the management, corrections, resolution which could be the idealistic result of research.

Keywords- Causes of delays, time overrun, cost overrun, Relative Importance Index (RII), Spearman's Correlation

I. INTRODUCTION

Risk can be defined as the intentional interaction with uncertainty. Uncertainty is a potential, unpredictable, unmeasurable and uncontrollable outcome and risk is a consequence of action taken in spite of uncertainty.

Risk management is the process by which risk or uncertainty in the project is minimized and the project is completed in optimum duration, qualitatively and with maximum return. It is used assertively to plan and reduce the adverse asserts in completion of project and possibility

Importance of Risk Management in Construction of Residential Projects

Though the term risk has got different meanings and from different angles, it can be defined as the potential that events expected or unexpected and which may have an adverse impact on a bank's learnings or capital or both .Both the risks having high probability low impact and low probability high impact are covered in this definition. It is useful to recall at this position that risk and expected return are positively related; higher the risk, higher the expected return and vice versa. The scope of risk management function in any organization is to ensure that systems and processes are set up in accordance with the risk management policy of the organization. The very basic objective of risk management system is to put in place and operate a systematic process to give a reasonable degree of assurance to top management that the ultimate corporate goals that are vigorously pursued by it would be achieved in the most efficient manner. In this way, all the risks that come in the way of the institution achieving the goals it has set for itself would be managed properly by the risk management system. In the absence of such a system, no institution can exist in the long run without fulfilling the objectives for which it was set up. This project is about why to carry out the risk and financial management in construction industry.

II. OBJECTIVES

- To know, what is management of risk
- To assess the common risks which cause bad effect on construction of project.
- To know the importance of financial management in the construction of Residential Buildings
- To find a solution to minimize these risks.
- To do Break Even Analysis of financial risk in residential Buildings Construction Project.

III. LITERATURE REVIEW

Nadeem Ehsan (2009) stated that the Construction industry is highly risk prone, with complex and dynamic project

environments creating an atmosphere of high uncertainty and risk. The industry is vulnerable to various technical, socio-political and business risks. In this paper, at the outset, general focus has been made on the general concepts of project risk management. A questionnaire was developed by going through literature on construction risk management. A discussion was made with Personnel working for the construction industry in Pakistan to identify and assess, the risk factors relating to construction industry in Pakistan. The aim of the this research is to identify and evaluate current risks and uncertainties in the construction industry through extensive literature survey and aims to make a basis for future studies for development of a risk management framework to be adopted by prospective investors, developers and contractors.

K. Jayasudha(2009) focused on the general methodology is to study relies largely on the survey questionnaire which will be collect from the various bridge project construction contractors and project manager of different sizes by mail or personnel meeting. The questionnaire prepared for the survey was formulated by seeing the relevant literatures in the area of construction management. This research seeks to identify the risk factors that affect the performance of bridge projects as a whole and analyze by using appropriate tools and technique and to develop a risk management framework. This questionnaire has been divided in to two factors namely time and finance management.

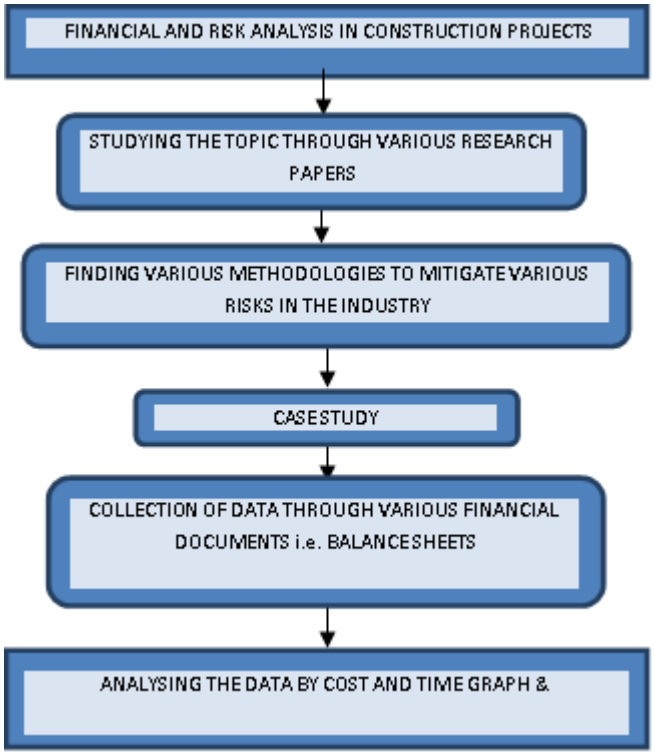
Shankar Neeraj, Balasubramanian (2010) stated that risk is a multi-facet concept. In the context of construction industry, it could be the likelihood of the occurrence of a definite event/factor or combination of events/factors which occur during the whole process of construction to the detriment of the project a lack of predictability about structure outcome or consequences in a decision or planning situation, the uncertainty associated with estimates of outcomes – there is a chance that results could be better than expected as well as worse than expected etc. In addition to the different definitions of risk, there are various ways for categorizing risk for different purposes too.

Patel Ankit Mahendra, Jayeshkumar R. Pitroda (2012) explained risk management as a process which consists of identification of risks, assessment with qualitatively and quantitatively, response with a suitable method for handling risks, and then control the risks by monitoring. This study proposes to apply the risk management technique which includes well – documented procedures for the one stop solution all types of hazards most likely to occur during any construction project lifecycle. In this paper, general focus has been made on the general concepts of risk management. Risk identification has been done with the study of literature. A questionnaire was developed after the identified factors affecting risk. A risk assessment can be done with the aid of

IV. RESEARCH METHODOLOGY

The general methodology of this study relies largely on the survey questionnaire which will be collected from the local building contractor by personnel meeting. A thorough literature review was initially conducted to identify the risk factors that affect the performance of construction industry as a whole. This study has adopted the more general and broad definition of risk and more risk factors from other literature. Also some interviews with industrial practitioners were conducted to produce to check effectiveness of questionnaires. After receiving the responses a model is used to evaluate the risk. The final step is to create a module for risk assessment.

The methodology adopted for this study is dramatically represented through the flow chart:



Break-Even Analysis

Break-Even analysis is a costing technique which shows the relationship between total cost and levels of output by classifying various cost elements, into fixed and variable. This analysis shows the amount of cost and profit or loss at various levels output.

The analysis is based on the following equation:

Sales (-) Variable cost = Fixed (+) Profit

The break -even points and break-even charts are the two by products which are:

Excellent tool of managerial control over business profits. The results of such analysis are usually presented in the form of break-even charts.

Essentially, it is a tool of financial analysis. It helps in showing the impact on profit position of the change in cost, price and volume with reasonable accuracy.

Break-Even Point:

It is the level of activity at which the total cost equals to the total selling price. The point is also known as 'No Loss Point'. It indicates the volume of sales from which the concern starts making profit.

Calculation of Break-Even Point:

There are two techniques used for calculating the Break-Even point, first one is equation technique and the other one is contribution technique.

According to this, the break-even point is calculated by using the following equation.

$$PQ = F + VQ$$

Where,
P = Selling price per unit
Q = Quantity of goods sold
F = Fixed Cost
V = Variable cost per unit

The Break-Even Analysis involves the following principles.

To find the safety margin with proposed volume.
To find the quality needed to have desired profit.
To find the effect of change in price.
To find the effect of change in cost.
To find whether to accept an order or not.
To find whether to add or drop a product.
To find whether to make or buy.

V. RESULTS AND DISCUSSIONS

As per the data collection and further calculation work, we have got cash inflow and outflow of a construction project and details of the same is mentioned in following table.

TIME PERIOD (MONTHS)	CASH OUTFLOW (LAKHS)	CASH INFLOW (LAKHS)	FLATS SOLD
JUNE	2.55	0	0
JULY	5	0	0
AUGUST	10	9	1
SEPTEMBER	15	13.5	0
OCTOBER	20	22.5	1
NOVEMBER	25	22.5	0
DECEMBER	30	31.5	1
JANUARY	35	45	0
FEBRUARY	40	54	1
MARCH	45	54	0
APRIL	50	63	1
MAY	55	79	0
JUNE	60	88	1
JULY	63.8	88	0

Table 4: Inflow and Outflow in 13 Months

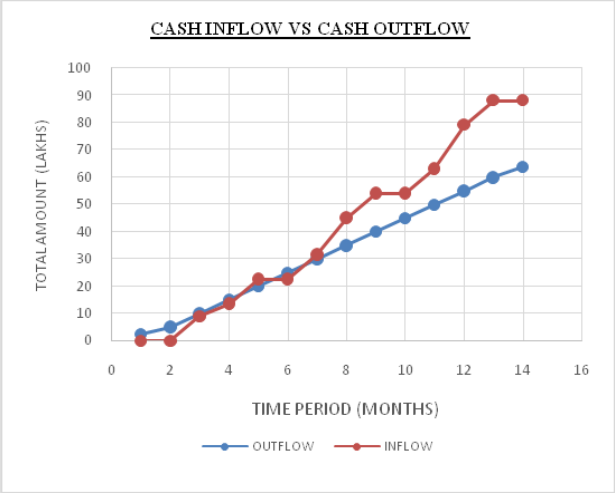


Fig 1. Graph of Inflow vs Outflow

Explanation of Graph:-

The above drawn graph is a graph of cash inflow vs cash outflow for the taken case study.

1. The X axis represents the time period from the start of the project since June 2015.
2. The Y axis represents the Total amount spent in (lakhs).
3. The graph represents the risk involved in the project at various stages during the construction of the project in the past one year.

4. At some coordinates, the points on both axis intersect each other which shows Break-Even Points. These are those points at which there is no loss and no profit. At some points the inflow is more than outflow which shows profit and at some points, the outflow is more than inflow which shows loss condition for that respective point.
5. The Blue Line represents the line of Outflow and the orange line represents the line of inflow.
6. The line of out flow is mostly constant because the money needed every month was almost the same.
7. The inflow line varies at different points, because the inflow at varies at different positions. The inflow totally depends on the number of bookings that were done and hence there is a risk because the builder has invested his money in the project which he cannot get back until the bookings are done.
8. There can be various reasons such as market slacks, for the bookings not done by people which results in the increase of probability of risk.

VI. RESULTS

It is found from the study that the project suffered a high amount of financial risk in the initial 7 months of its start of construction, as the money of the builder was at stake due to less number of bookings of the flats.

The project faced problems like absence of labors, time lag in procurement of materials, even after proper payment. Hence, there occurred a time lag in the initial 3 to 4 months.

As the project got delayed, may it be on a small scale, the amount of finance required increased, which directly brings on financial risk and pressure on the builder. Hence proper strategic planning needed to be done here.

In practice, this phenomenon is expected to reoccur in the future, hence proper management actions are to be taken to control these causes within the planned element of design and construction works. Thus, good practice in planning, coordination and change of control procedures with respect to finance needs to be recognized and its implications need to be understood.

Recommendations:

Referring study strategies can be adopted to eliminate the impact of financial risk and its impact and pressure on the concerned authority. The use of Work Breakdown Structure and Risk Breakdown Structure can be extremely beneficial for the elimination of this problem.

The study is limited regarding to the tracking process in terms of start variance and finish variance, schedule variance and cost variance indicators for the construction of residential project, which is a real estate project cost. A study of other large scale residential projects could give a quite different picture as it may have a different scenario. Moreover, there is usually reluctance from the part of the project authorities to revel the data. More number of samples could give us a much clearer picture.

VII. CONCLUSION

- India is a developing country, and population of the country is tremendously increasing. This intern increases the pressure on the infrastructure and residential construction field. There are a large number of residential projects going on across the country. Government as well as the private sector are working hard for such development and are running behind the same objective.
- In field of Civil Engineering, construction is a process that consists of assembling the infrastructure. Far from being a single activity, large scale construction is a feature of multi-tasking. Normally the job is managed by the construction manager, Design Engineer or the Architect. For the successful execution of the project, successful planning is essential.
- Besides successful planning, according to a survey carried out by the government of India it has been reported that more than 80% of the projects suffer from severe financial risks. Reasons for such delays which cause cost and time overruns and high level of financial risk are huge and enormous. Financial risks are often the result of unclear contracts, quarrel between partners, project overruns and the major reason being loans which are given on a large interest rates. The impact of financial risks can be disruptive and expensive.
- Even though there are plenty of management techniques for financial risks, most of the projects do face this problem on a very large scale. Some of the projects have been shut down leaving the construction work incomplete taking money from people. All these problems makes it very difficult to complete the project on time and within the estimated budget.
- The use of better strategies for management of financial risks and proper analysis of this particular factor can improve the situation and can lead to achievement of

more growth and development of the economy as a whole.

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