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A REVIEW ON COST ESCALATION MA\NAGEMENT FOR CONSTRUCTION INDUSTRY

Nilesh D Patil*, B. A.Konnur, Pratik A Pol
* M.Tech scholar, Department of Civil Engineering, Government College of Engineering, Karad
Associate Professor, Government College of Engineering, Karad
M.Tech scholar, Department of Civil Engineering, Government College of Engineering, Karad

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ABSTRACT
The Construction Industry is an vital sector in any economy and significantly contributes to the development of a country. Cost escalation is one of the important identified risk faced by the construction industry. This can be accounted for a substantial part of construction cost especially in long term projects where the risk is more preponderant. Hence to overcome this problem there arise a need to access the risk of cost escalation in construction industry. Therefore the objective of the study is to propose new and modified techniques so that subject area inclines towards accuracy and perfection under the case study of construction project. The study throws light on existing method i.e. Whole Sale Price Index(WPI) along with their advantages and limitations that are being used in computation of cost escalation. The study propose new approaches and methods such as the Market Rate Method (MRM) that can be implemented in the field of cost escalation, So that different complexities and ambiguity in the current used techniques could be removed.

INTRODUCTION
In India cost escalation is one of the major phenomenon faced by the construction industry which has led to delay of several other projects associated with it. Thus there is require more realistic approach towards the management of cost associated with the projects. In general projects in construction industry ranges from several months to several years. Hence there is probability that the cost of material and labour increases, hence it is results into increasing the cost of project. Escalation is a risk that can description for a substantial part of construction cost, especially in long term projects where the variability and uncertainty is greater. In multi-project programs, the outcome of escalation can be the prime concern. Cost escalation in construction project refers to likely increase in cost of constructing a project over a period. Cost increase usually occur as a result of fluctuation of market forces and reflect increases in the cost of material/ labour and higher levels of construction activity.

LITERATURE REVIEW
Escalation reflects change in productivity, profit margins and market conditions such as high demand and so on. And complicating the situation price escalation varies by region and procurement strategy [1]. Cost escalation is directly relative to increase in price of all the construction element of the original contract. Escalation in construction market has been extremely unpredictable and is expected to continue in the near future due to demand for resources, skilled workers and continuous strong growth [2]. Nine out of every ten construction projects experience cost escalation and generally occur before construction begins. Escalation mainly attributes because of poor site management and supervision, speed of decision making and client-initiated variations at the construction phase of the project [3]. Delay in projects are the universal fact and construction projects are no exception. cost escalation can be categorized into two broad groups : uncontrollable and controllable factors [4]. Till now, many researchers have presented various risk management models and techniques to minimize risk of escalation. But the correlation among various risks associated with escalation and their interdependency is not yet reported. Therefore, the main objective of this study reflects methods by which participants in construction projects can both track the extent of escalation and work together to minimize the impact of cost escalation on the success of a project.

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COST ESCALATION

Escalation can be defined as change in price level driven by underlying economic conditions (John K. Hollmann an dLarry R. Dysert, 2007). Escalation reflects change in price-drivers such as productivity and technology, as well as change in market conditions such as high demand, labor shortage, profit margins and so on. Escalation also includes the effect of inflation which is general change in prices caused by debasement of the value of a currency. From an estimator's perspective, escalation is a unique "risk" cost that must be estimated. Complicating the issue , price escalation varies for different capital project components such as office and field labor, bulk material and equipment.

Escalation in Construction

Cost escalation in construction is the increase in the cost of any construction elements of the original contract or base cost of a project (Ali Touran and et al. 2005). Cost escalation in construction, is the increase in the cost of any construction elements of the original contract or base cost of a project due to passage of time (Christoper H Kiwus et al. 2001). Escalation is caused by many factors such as inflation, market conditions, risk allocation clauses in the contract, interest rates and taxes. "Cost escalation" in most international literature, is determined as the difference between the as-built project cost and the contract award amount (including contingency amounts). When this value is negative, it is called a cost under run (Abhishek Bhargava et al. 2010). It is worth noting that in a few cases, the actual contract award amount may be slightly higher or lower than the original bid amount because exigent circumstances may cause the owner to negotiate with the winning bidder to include or exclude some work

Understanding Escalation

In order to measure or manage escalation on construction projects, it is first important to understand the driving forces behind it(Peter Morris et al. 2006). This is especially critical in the current situation, where price fluctuations have been so volatile that it has been difficult to predict or estimate what bid prices might actually be. The most important factor is that construction must be viewed as a commodity in itself, not a collection of commodities. The selling price of a project is not the result of the sum of its inputs plus a profit, except in the very rare cases where all work, including sub-contracts, is procured through a cost-plus contract. In all other cases, the selling price of a contract is determined by the bidders based on their opinion of the competition. At a very basic level, it simply needs to be $1 less than the next bidder. The sum of the input costs will provide a floor below which a bidder is normally unwilling to go, and so changes in input costs will influence bids to some degree. The ceiling is, however, set by the bidder's opinion of the competition: the key here being the word "opinion". The bidder must not only estimate their own costs, but must also estimate what the other players will do. One further consideration is that of risk. Strictly speaking, this belongs on the input side of the equation, since it relates to how input costs might vary: Will materials be available at the estimated price? Will labor productivity match the estimate? Can I find sufficient labor? As risk increases so too does the floor below which bidders are unwilling to go.

Risk is very difficult to estimate, and few bidders do it systematically. Risk assessments are usually heavily influenced by short term perceptions based on the latest news, and as a result are often very inaccurate. Escalation, therefore, comes from the interplay of changes, real or anticipated, in input costs, perceptions of risk, and perceptions of the competition. In some cases it comes from real information, such as actual changes in the cost of critical materials like steel or copper. More often than not, however, it comes from the formation of market opinions, which may or may not have a basis in fact. Ultimately, the ability for contractors to raise prices depends entirely on the market conditions, and the expectation that all bidders are increasing their prices. Increased input pricing and increased risk can influence that expectation, but cannot on their own increase prices. There is no such thing as a "pass through."

Construction Project Cost Escalation Factors

Jennifer S. Shane et al. (2009) made an attempt by triangulation analysis from past studies and interviews to create a categorization for the causes of cost escalation. A better understanding of the cost escalation factors is achieved through understanding the forces driving each factor or where the factor originates. With this understanding it is possible to design strategies for dealing with these cost escalation factors. The factors that affect the estimate in

each project development phase are by nature internal and external. Factors that contribute to cost escalation and are controllable by the agency/owner are internal, while factors existing outside the direct control of the agency/owner are classified as external. It is important to note that one of the factors points to problems with estimation of labor and material cost, but most of the factors point to "influences" that impact project scope and timing.

Internal

Internal factors are cost escalation factors that can be directly controlled by the project's sponsoring agency/owner. While numerous internal factors can lead to underestimation of project costs during the planning and design stages of development seven primary internal factors are well documented: bias, delivery/ procurement approach, project schedule changes, engineering and construction complexities, scope changes, scope creep, poor estimating, and additionally there is the issue of inconsistent application of contingencies.

Cost escalation does not only occur during the planning and design phases of a project. Project cost growth often manifests itself during construction. Focusing early on internal factors will reduce cost growth at bid time or during construction. Internal factors that lead to the underestimation of project costs during the execution of a project stem from poor project management and defective design documents. More specifically, these factors can include inconsistent application of contingency, faulty execution, ambiguous contract provisions, and contract document conflicts.

External

External cost escalation factors are those factors over which the agency/owner has little or no direct control over their impact. However, the agency/owner needs to consider them when estimating project costs. During the planning and design phase of project development external factors such as local government concerns and requirements, fluctuations in the rate of inflation, scope change, scope creep, and market conditions can lead to underestimation of project costs. During project construction external factors such as local government concerns and requirements, market conditions, unforeseen events, and unforeseen conditions can be responsible for increases in project cost. The possibility of such incidents must be considered during estimate preparation. Again it must be recognized that each of these elements can act separately or in combination with others to cause significant project cost increases.

Modeling of Escalation Factor

The escalation factor is the rate of change of the indices from year to year and can be calculated from Equation 2.1(Ali Touran; and Ramon Lopez (2006))

$$\Delta_i=[(\frac{I_i}{I_{i-1}}) - 1] \text{ x } 100 \text{ \% ...} \quad (2.1)$$

Where i=percent of change of period i; Ii=index of period i; and Ii−1=index of the previous period (i−1). A positive value of i is an indication of increase in cost. In contrast, if the value of i is negative, that is because period i has experienced a deflation. i is then the escalation factor that we are trying to model as shown in Equation 2.2.

$$r =[(\frac{I_i}{I_b})^{1/n}\text{-}1] \text{ X } 100 \text{ \% ....} \quad (2.2)$$

Where r=average rate of change; Ie and Ib= index values in the ending period; and the beginning period, respectively; and n=number of periods

CONCLUSION

Construction cost escalation is important because escalation accounts for a substantial part of the costs of many construction projects. Different forecasting methods can be used for risk identification and minimization. In this paper importance of cost escalation in large long-term construction projects is examined. Various methods of forecasting escalation rate are reviewed and an approach is proposed that explicitly considers the random variations in the escalation rate.

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