Study of Price Escalation in Building Construction Industry on Basis of Basic Rate

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Abstract*—The Construction Industry has a major role in the development of India's economy. The industry shares about 45-50% of the ninth five year plan outlay and contribute 20% of GDP. However, the performance record in successfully implementing infrastructure projects in India has not been very encouraging. Cost overrun and cost escalation are part and parcel of the construction projects in India. Lack of adequate research in the area of the price escalation management have been the motivation for the current research. The research aims to trends in price of major building materials and cost in India. A mixed approach of interviews and case studies has been used for these purposes. Significant factor categories and factor influencing the cost escalation have been identified and evaluated through a structured questionnaire survey and have been validated through case studies. Most significant cost escalation factor categories are Steel, Cement, Teak wood door frame & Tiles. Most significant cost escalation factor are raw material input cost, demand and supply, power traffic, transportation cost, inflation, exchange rates and government policies. The major material component (Steel & Cement) contribute to about 50% of overall cost of the project. The escalation in price of these materials have a direct impact on the delay in project completion, quality and dispute.Finding from the research can provide a rich source of recommendations for construction organization and project participants working in the construction industry to enhance their project performance.*

Keywords— GDP, Steel & Cement, Industry

I. INTRODUCTION

In general, construction projects are usually of quite lengthy ranging from several months to several years. All projects are to be performed according to a pre-confirmed contract amount and contract agreement in principle. Therefore, there is a strong probability that the cost of labour and material will rise or fall periodically, to a greater or lesser extent during the life of project. Hence there is a possibility for most of contractor is that they have to bear damage at that particular period due to sudden change rise of international raw materials or exchange rates under lump sum or fixed price contract. Therefore, the provisions regarding contract price escalation should be rearranged 0systematically to cope with the sudden price changes.

Escalation is a term used in most countries, to indicate extent of these changes from the commencement of a project through any point during its life. As equivalent terms fluctuations rise and fall and contract price adjustments are used interchangeably.

In India during 1960s, for the first time normal concept of fixed value constructions contracts was modified and cost variations clause was provided in form of reimbursement of the part of excess expenditure incurred due to an effect of statutory rules, laws and order.

In 1980s, a formula based approach was adopted for compensating cost variations on account of variations in market rates of materials, labours, and fuel.

A. Need of Price Escalation

The wealth of a nation is measured by its performance in infrastructure provisions through its construction industry. The financial success of construction projects can be uncertain and at risk due to changes in escalation rates during construction. The success of a construction projects is mainly influenced by to what extent of cost escalation identified and allocated to the projects. Cost escalation is part and parcel of construction projects in India. Escalation in construction market in recent years has been extremely volatile, and this trend expected to continue in the near future due to competition for resources and skilled workers. This situation has created a great deal of uncertainty and nervousness among construction field.

B. What Is Escalation?

- Escalation can be defined as change in price levels driven by underlying economic conditions.
- Escalation is the provision in cost estimate for increase in the cost of equipment, material, labour etc. Due to continual and periodical price changes over the time.
- Escalation is used to estimate the future cost of project or to bring historical cost to the present.
- Escalation reflects changes in price-drivers such as productivity and technology, as well as changes in market conditions such as high demand, labour shortages, and profit margins as so on
- Escalation also includes the effects of, but differs from, inflation which is a general changes in price caused by debasement of the value of a currency.
- From an estimator's perspective, escalation it is a unique RISK cost that must be estimated.
- Complicating the issue, price escalation varies for different capital projects components such as office and field labour, bulk materials, and equipment it is also varies by region and procurement strategy.

C. What do you mean by Basic Rate?

A basic rate is the sum set in the Price column of a BOQ to cover the work described in the BOQ item. When multiplied by the quantity it gives the contract price for that item.

The basic rate covers everything required to complete the work which is set down in the drawings and specification and described in the BOQ.

Matters such as taxes and levies will be described in the pricing guide in the invitation to tender.

D. When is the Basic Rate decided?

A basic rate is decided by the owner, at the invitation of tender. The owner has the right to fix higher or lower quality of same material. The contractor have to submit the tender considering the same basic rate.

II. LITERATURE REVIEW

1) Blair et al (1993) 'Forecasting construction cost escalation', Canadian Journal of Civil Engineering, Vol. 20, pp. 602-612.Have studied forecasting construction cost escalation is important, Escalation accounts for a substantial part of the costs of construction projects. Using forecasting software, many complex statistical forecasting techniques can now be used to forecast construction cost escalation. Univariate time series method, cannot predict turning points, as it is based on the existing pattern of the data. Multivariate forecast methods are dependent on the accuracy of the explanatory variables used in the forecasts. One the main difficulties in their use is the identification of statistically significant explanatory variables. The accuracy of the multivariate forecasts produced depends on the accuracy of the explanatory variables used to make forecasts. The analytical forecasting techniques are only valid for short-term forecasting in stable condition, generally less than one year ahead. No analytical forecasting technique is capable of long-term forecasting of cost escalation.
2) Touran (1993) have studied probabilistic cost estimating with subjective correlations. The study identified that difficulties in probabilistic estimating is accounting for the existing correlations among cost components modelled as random variables. They have discussed a methodology for generating correlated random numbers in a Monte Carlo simulation for construction cost estimating. A methodology is then suggested that simplifies the process of incorporating the effect of correlation coefficients in probabilistic estimating. This methodology consists of assigning subjective measures of correlation between variables. Also, a method is suggested for adjusting the covariance matrix in which correlation estimates are not accurate.
3) Hastak et al (1996) 'COMPASS – New paradigm for project cost control strategy and planning', Journal of Construction Engineering and Management, Vol. 122, pp. 254-264have carried out study on cost management planning support system for project Cost Control Strategy and Planning (COMPASS) was presented a new paradigm and a management tool for formulating effective strategies for project cost control. The study found that throughout the life cycle of a projectCOMPASS methodology assists management in evaluating the potential degree of cost escalation and identified attributes such as management errors, regulatory approvals, and error/rework that might be the cause for project cost escalation.

III. OBJECTIVE

1) To detail study of price escalation and its need.
2) To identify the factor affecting price escalation in building construction industry.
3) To identify the trend in price escalations.
4) To promote and apply the methodology of price escalation on construction site.
5) To analyse the trend in price of building material.
6) Compiling conclusion and benefits of price escalation regarding construction sites.

IV. PROJECT METHODOLOGY

Price escalation aims to maximize the benefit to both the customer and the contractor, By choosing a cost estimation and obtaining the benefit.

A. Factor Affecting Price Escalation in Building Construction Industry

1) Bias

Bias is the demonstrated systematic tendency to be overoptimistic about key project parameters. It is often viewed as the purposeful underestimation of project costs to ensure a project remains in the construction program.

2) Delivery/Procurement Approach

Delivery/procurement approacheffects the division of risk between the agency/owner and the constructors, and when risk is shifted to a party who is unable to control a specific risk, project cost will likely increase. The decision regarding which project delivery approach, e.g., design-bid-build, design-build, or build operate- transfer and procurement methodology e.g., low bid, best value, or qualifications based selection affects the transfer of project risks. In addition to the question of risk allocation, lack of experience with a delivery method or procurement approach can also lead to underestimation of project costs.

3) Project Schedule Changes

Project schedule changesparticularly extensions, caused by budget constraints or design challenges can cause unanticipated increases in inflation cost effects even when the rate of inflation is accurately predicted.

4) Engineering &Construction Complexities

Engineering and construction complexitiescaused by the project's location or purpose can make early design work very challenging and lead to internal coordination problems and project component error.

5) Scope Changes

Scope changeswhich should be controllable by the agent/owner management, can result in underestimation of project costs. Such changes may include modifications in project construction limits, alterations in design and/or dimensions of key project items such as adjustments in type, size, or location of project components, as well as other increases in project elements.

B. Phases of Cost Escalation

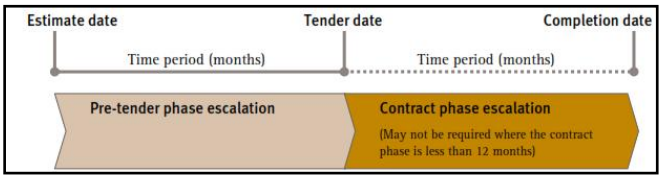

Fig. 1:Pase of Cost Escalation

C. Material to be taken in to Consider For Price Escalation in Case Study

In construction industry steel, cement are the basic items used for construction, the rate for the same items are in fluctuation due to which the customer and the contractor faces the losses in the contracts.

The item rate contract between the AtharvaBuildcon (Contractor) and the MKSSS (Owner) is taken for the case study .As we are going to follow basic rate escalation the following items are been taken in to consideration with their basic rate. As these item contribute the most cost to the construction of the building as per A,B,C analysis.

Sr.No.	Description	Unit	Rate
1	Steel	M.T.	47000
2	Cement	Bag	310
3	Teak Wood Frame	CU.M.	10500
4	Flush Doors	SQ.M.	1200
5	PVC Doors	SQ.M.	2350
6	Laminate For Doors	SQ.M.	1147.50

Table 1: The Items with the Basic Rate

Steel is the one of the main consumed item in the construction industry and the rate for the same are different daily due to the fluctuating markets.

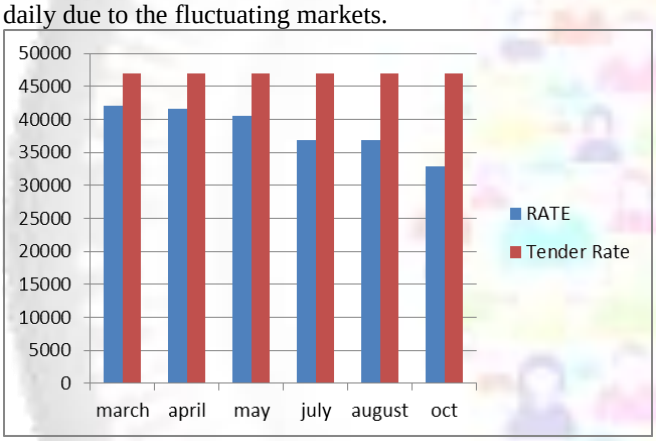

Fig. 2: The Table Shows the Fluctuation in the Rate of Steel per Ton's to the Basic Rate

Cement is the highly consumed component in the construction industry.

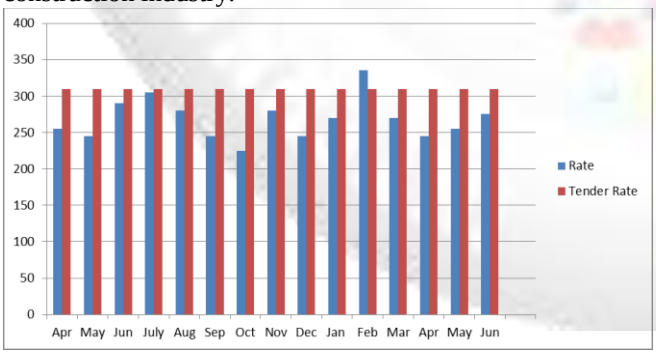

Fig. 3: the table shows the fluctuation of the rate of cement per bag to the basic rate

Sr. No.	Description	Amount (Rs.)
1	Cement	-9,12,634.00
2	Steel	-21,39,878.00
3	Teak Wood Door Frame	2,89,113.77
4	Flush Door Wooden	-12,013.50
5	Laminate	1,02,306.24
6	PVC Door	-22,591.32
	Total Amount Difference	-26,95,696.81

Table 2. Final Price Escalation

V. CONCLUSION

The data was collected at the end of the contract, the Table 2. shows following results

1) The steel and cement are major contribution to the construction industry and the rate of this item are varying.
2) The price escalation helps in computing the cost of project as per the trending price of the item.
3) The application of price escalation on construction site benefit both the contractor and the owner at the end of the contract.
4) After applying the basic rate price escalation the contractor can claim the extract amount for the specific item and owner can retain the extra amount from giving to the contractor.

ACKNOWLEDGEMENT

The author of this paper is highly obliged to the Department of Civil Engineering, PadmabhushanVasantdadaPatil Institute of Technology, Bavdhan, Pune and the Management of TSSM. Author would like to express their deep scene of gratitude towards P.G. coordinator Department of Civil Engineering, PadmabhushanVasantdadaPatil Institute of Technology, Head of the Department and the other staff of the Institute.

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