

# IMPACT OF INEFFECTIVE TENDERING PROCESSES ON CONSTRUCTION PROJECTS

N.A.J.N. Srimal, Vijitha Disaratna and P. Ganeshu\*

Department of Building Economics, University of Moratuwa, Sri Lanka

## ABSTRACT

*Tendering process is the method adopting in procurement for the selection of the contractor, who is responsible for carrying out the construction works. The tendering process is built up with several functions, performed by main tendering stakeholders. Certain substandard practices of the stakeholders during the tendering process create an ineffective tendering process. It directly results in adverse outcomes during the post contract stage of a construction project. Due to the high involvement of these ineffective tendering outcomes, the construction project is impacted adversely and may fail in fulfilling the project objectives effectively. The research investigated the impact of the ineffective tendering process to the construction project and it was equipped by questionnaire survey while the analyses are carried out in a specific analysis method developed for this research.*

*Initially the research found the contribution of the substandard practices to cause the ineffective tendering process. Then the probabilistic impacts to the construction project were investigated through the probabilistic outcomes from the ineffective tendering process. Additionally, the research has brought some effective solutions to mitigate ineffective tendering process.*

*The findings of the research indicated that the effect from the ineffective tendering process to the construction project can be mitigated by properly following the governing tender rules, adhering to good codes of conduct and ethics, managing the future risks during the estimating process by the bidders and maintaining better communication during tendering.*

**Keywords:** *Ineffective Tendering Outcomes; Ineffective Tendering Process; Tendering Process; Tendering Stakeholders.*

## 1. INTRODUCTION

Tendering is a process starts with inviting the bids from interested contractors to carry out specific packages of construction work (Contracts & Law, 2011). Further, it is worth remembering that every activity in the tendering process has a time and cost implication. An appropriate tendering procedure should ensure that the client obtains a competent service at a realistic price (Brook, 2004). Tendering processes in the construction industry are fragmented and different with compared to other domains tendering practices. Managing tender procedure in construction procurement is often very complex (Mohemad *et al*, 2010). It is generally believed that wrong tendering practice is a major contributor to the construction industry's inefficiency (Ayeni, 1997). Mistakes, errors and other weaknesses occurred during the tendering process will be reason to turn the whole tendering process ineffective (Milne, 1980).

Any failures during the tender phase can cause problems during the operating or delivery phase (Business Teacher, 2008). Central Vigilance Commission-Government of India (2002) point out that the ineffective tendering process cause by some factors which contains conflicting, vague and ambiguous provisions especially in the tender documents. It results undesired outcomes such disputes, delays and financial losses in the post tender stage. Those outcomes create impact on construction projects such as cost overrun, time over

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\*Corresponding Author: E-mail – sunganesh21@gmail.com

run and quality issues (Sunday, 2010). The tendering process is subject to some legal actions and policy requirements as solution to avoid delays, complaints, criticism and even litigation (Ashworth, 2006; Business Teacher, 2008). Accordingly, it is clear that, various shortcomings can be occurred in the tendering process. Even though this is an undeserved for the construction project, tendering in an ineffective way is already visualized practically in Sri Lankan context. When taking in to the consideration of past researches on the topic of tendering, most of the researchers studied about estimation and not related to whole tendering process. It is hardly found a research concentrate on this impact on ineffective tendering process. Therefore, it clears a path to carry out this research on investigate the impact of ineffective tendering process to the construction project in order to propose solutions to mitigate the impact through identifying causes and outcomes of ineffective tendering.

## **2. LITERATURE REVIEW**

### **2.1. FACTORS LEADING INEFFECTIVE TENDERING**

Involvement of parties in construction industry creates the factors which leads ineffective tendering in construction industry. Accordingly, Ineffective selection of tendering method, it means incorrect choice of the method to selecting a suitable contractor resulting unsuccessful project. Selection method need to be considered carefully to select best among the available contractors (Smith, 2000), Poor participation of the bidders also leads improper contractor selection as potential contractors may not participate (Brook, 2004; Nkado *et al.*, 2009). Therefore, proper contractor selection is essential to the project success. Further, authors said that Changes in project requirement during the tender process after the bid submission also can lead the unwanted outcomes in projects as variation and delay. Issues with information (Brook, 2004), Ineffective tender evaluation (Business Teacher, 2008), Communication gaps between consultant and bidders, consultants need to pass all information regarding bid to bidders to get quality bids which helps to avoid outcomes such as cost overrun and time overrun (Ramus *et al.*, 2006; Business Teacher, 2008). Above factors are identified as consultants' drawback. Further, in tendering process, estimating errors (Smith, 2000; Potts, 2008), poor responsiveness of the bid (Business Teacher, 2008), are identified as bidders' drawbacks. Ethical problems (Ray *et al.*, 1999; Palaneeswaran & Kumaraswamy, 2000; Sidwell *et al.*, 2001), Documentation errors in the tender document and arithmetic and documentation errors of bidders can be lead ineffective tendering (Ramus *et al.*, 2006, Samantha, 2007; Business Teacher, 2008) are identified as both consultant and bidders drawbacks. Those drawbacks considered as the factor affects tendering process gives undesired outcome in the construction projects.

### **2.2. OUTCOMES OF THE INEFFECTIVE TENDERING PROCESS**

Dalrymple *et al.* (2006) indicated the implied message that the cost of tendering is significant among the project cost. Cost of preparation of tender documents by consultant, cost of preparation of response to tender by potential contractors and cost of assessment of submitted tenders are the costs occur during tendering process. Ineffective tendering is affect severely to the cost of tendering. More to the point, if these costs are not managed effectively then they can be quite significant and not provide proportionate returns from the tendering process (Dalrymple *et al.*, 2006). Retendering is more expensive process and much more expensive than the original transaction. The additional costs of re-tendering will affect not only the principal but also the new tenderers (Ray *et al* 1999). Improper tender process may cause inefficient tender submissions and leads retendering (Hutchinson, 2008; Northwest Territories, 2009).

Mohammad *et al* (2010) found some cases which the variations are required because of the consultant's failures during the tendering period. Those are changes in project requirements, errors and omissions in design, conflicts between contract documents, inadequate scope of work, and inadequate information given in tendering. Tendering issues are identified as main reason leads to delay and disputes on during the contract period due to tender document with any ambiguity, lack of facts or confusion, inviting tenders on incomplete drawings and inadequate information (Smith, 2000; Potts 2008; Sunday, 2010). The most tender-related claims against consultants involved alleged errors in the underlying design for the project (Berezowskyj, 2009).

### 2.3. IMPACT OF THE INEFFECTIVE TENDERING OUTCOMES

Time delay in completion schedule and variations in construction projects are the major reasons for time overrun and cost overrun (Central Vigilance Commission-Government of India ,2002; Sunday ,2010; Baloyi & Bekker 2011). Unethical behavior causes a consequential decline in the quality of project (Adnan *et al.*, 2012). On the other hand, variations in the project also may cause quality degradation of the project (Fisk as cited in Sunday, 2010). Consultant has to pay more attention on it whenever variation, claims and disputes arise in the project. (Arain & Pheng, 2006) argued that increasing variations, claims and disputes in the project is a ground to overburden the consultant's contract administration process (Potts, 2008). Kashiwagi and Murphy (2004) emphasized that disputes arisen in the construction project is a great potential for financial loss. Further, Potential bidding errors, reducing markup for winning tender will result in lower job profitability of the contractor (Davidson & Maguire, 2012). It is obvious to say that the disputes may result in minimizing the contractor's profit unless otherwise it results in financial loss (Semyalo *et al.*, 2012).

### 2.4. SOLUTIONS TO MITIGATE THE IMPACT

Avoiding ineffectiveness of the tendering process will reason for minimize the terrible outcomes and impacts in the project. For that, consultant has a legal duty to ensure that the tender rules are followed and that all bidders are treated fairly (Berezowskyj, 2009). Further author said that adhere good code of conducts and ethics helps to prevent from unethical issues with all parties in tendering process. When tendering, Contractors should manage the risk of being required to perform unexpected indispensable works (Business Teacher, 2008; Yeoh, 2010). A special care should be taken in the tendering process regarding the receipt, recording, assessment and confidentiality. Simultaneously, audits may be undertaken at any stage of the tender process for safeguard the employer (Capital Development Guidelines, 2011).

Since, the contractor will be reliant upon the information provided by the Principal. It is important to and communicates properly to manage the risk of being required to perform unexpected indispensable (Yeoh, 2010). Further, it has been mentioned that it is mandatory to the contractor to request further information or clarification from the Principal where the information is ambiguous, or appears to be incomplete and not rely fully upon the accuracy of any information provided by the Principal.

When estimating, using a good estimating package and reviewing bid is must. Once the contract is awarded, the actual costs must be routinely compared to the original bid in order avoid profit minimization (Davidson & Maguire, 2012). Sub-contractors need to be reviewed for completeness as well as vendors should be requested to submit a written confirmation of their bids to avoid problems in post contract stage (Levy, 2002).

## 3. RESEARCH METHODOLOGY

This research is based on survey approach to achieve its aim and objectives. Convenience sampling is a common nonprobability method adopted for this research. Chief quantity surveyors, project managers, director/ general managers who are involved in tendering process and experienced participants on pre contract and post contract practices were involved in this survey from both contractors and consultancy organization. 40 questionnaires were issued and 32 of them were responded.

Required information was identified through literature review. Then all of those were listed out in questionnaire to identify the impotency of the findings identified from the literature in Sri Lankan context. Questionnaire was designed in a manner to get the maximum effective answers from the respondents. Descriptive statistics were utilized for analyzing. Descriptive statistics includes the methods of organizing, summarizing and presenting data in an informative way (Jayasinghe, 2010). Mode, mean, weighted mean and probability of occurrence were used as data analysis tools.

Weighted Mean was used to analysis the level of outcome from ineffective tendering and identify the level of impact of each outcome and rank the mitigate solution. Weighted mean calculation illustrated below.

$$\text{Weighted mean} = \frac{\sum(W_i \times F_i)}{\sum W_i} \quad \text{Eq. (01)}$$

Where,  $W_i$  = weighting factor and  $F_i$  = Frequency of response

In addition to that probability of happening these identified outcome and possibility of impacts were analyzed by probability theory as given below.

$$\text{Probability (P)} = \frac{n(A)}{n(S)} \quad \text{Eq. (02)}$$

Where,  $n(A)$  = number of responses and  $n(S)$  = Sample space

## 4. DATA ANALYSIS AND RESEARCH FINDINGS

### 4.1. CAUSES OF INEFFECTIVE TENDERING

The respondents have been asked to rate the given factors considering their relative influence to cause adverse effect to the tendering process based on a five point Likert scale where 1 to 5 rates indicated ‘poor influence’ to ‘significant influence’ respectively. Thus, the mean value of these ratings were analysed and the following results have been taken.

Table 1 : Rankings of the Causes of Ineffective Tendering

No.	Factor	Mean Rating	Rank
1	Ineffective evaluation of received bids	4.25	1
2	Wrong selection of the tendering method	4.13	2
3	Issues in provided tendering information	3.94	3
4	Errors in the tender documents	3.88	4
5	Changes in the project requirements by the employer	3.84	5
6	Poor communication	3.81	6
7	Bad ethics of the consultants	3.78	7
8	Design changes by the consultants	3.69	8
9	Poor responsiveness	3.63	9
10	Bad ethics of the bidders	3.59	10
11	Poor participation of the bidders	3.50	11
12	Estimating (pricing) errors	3.03	12
13	Arithmetic and documentation errors of the bidders	2.63	13

Errors in the tender documents and arithmetic and documentation errors of the bidders have been suggested by most of the authors in the literature review. Nevertheless, out of all the causes of ineffective tendering process, ‘Ineffective Tender Evaluation’ has become a crucial reason to create an ineffective tendering process followed by ‘wrong tendering method selection’ and ‘issues in providing tendering information’ respectively. Consequently, the factor ‘arithmetic and documentation errors in the bidders’ have least possibility to create ineffective tendering process.

### 4.2. INEFFECTIVE TENDERING OUTCOMES

Outcomes of the ineffective tendering which had been identified in the literature review were verified from the questionnaire survey in order to find out “to what extent ineffective tendering leads such outcomes?” The summary results are given in Table 2. Here weighted mean was calculated by considering the mean value of each factors identified in prior objective as a weighted value and frequent considered as how many responses were given by respondents under each outcome (respondents were allowed to mark more than one outcome due to each factor causing ineffective tendering). Probability of outcome was calculated to indicate the degree of possibility of forming such outcomes by the ineffective tendering process. It was arrived through dividing number of respondents responded for an outcome by total number of respondents.

Table 2: Summary of the Analysis on Ineffective Tendering Outcomes

Outcomes	Weighted Mean	Probability of Outcomes	
High tendering cost	5.19	1/6	16.23%
Re-tendering	8.30	1/4	25.95%
Variations and extra-works	11.52	1/3	36.00%
Disputes	14.49	4/9	45.28%
Delay	12.13	3/8	37.92%

Specially, Claims and disputes could be able to identify as the most probable outcome from these outcomes of the ineffective tendering process. On the other hand, high tendering cost is relatively lower probable outcome due to ineffective tendering process. Identically in the literature findings, most of the authors suggested claims and disputes and less number of authors suggested high tendering cost. Hence the percentage of the outcomes was calculated considering probabilities of all five outcomes together.

#### 4.3. IMPACT ANALYSIS OF INEFFECTIVE TENDERING

Each respondent had to compare between identified outcomes and the impacts in order to decide the possibility of causing each impact by each outcome separately in a value from 0 to 10. To identify impact value, all given value for particular impact due to each outcome was added and multiplied with probability of Outcome. Impact value identified by using following formula,

Impact Value = Total of Possibility values x Probability of Outcome

For example, given total possibility value of cost overrun due to high tendering cost = 96 , Probability of high tendering cost outcome =  $1/6 = 0.17$  , therefore, impact value =  $96 \times 0.17 = 16.32$  as given below.

To identify the probability of impact, total impact value of each impact from all outcomes were calculated and divided by total possible impact value. (Total maximum possible impact value is arrived by considering Maximum value 10 for 5 out come from 32 respondents =  $10 \times 5 \times 32 = 1600$ ).

For example, Total impact value of cost overrun due to all five outcome = 306.78, Total maximum possible impact value = 1600. Thus, probability of impact =  $306.78/1600 \times 100 = 19\%$

Impacts of ineffective tendering due to each outcomes and calculation of impact value of each impact and probability of impacts are shown in Table 3.

Table 3: Impact Values and Probability of Impacts

Outcomes	Impacts	Impacts					Less profitability
		Cost overrun	Time overrun	Lower project quality	Overburdened contract administration	Financial loss	
High tendering cost		16.32	3.57	8.5	9.01	4.76	4.93
Re-tendering		29	55.75	11.25	16.25	9.25	6.75
Variations and Extra works		93.06	82.83	22.44	54.78	16.17	18.81
Claims and disputes		109.12	98.12	51.48	85.8	62.48	53.24
Delay		59.28	116.28	48.26	53.96	50.16	52.06
<b>Total impact value</b>		<b>306.78</b>	<b>356.55</b>	<b>141.93</b>	<b>219.8</b>	<b>142.82</b>	<b>135.79</b>
<b>Total possible impact value (Maximum)</b>		<b>1600</b>	<b>1600</b>	<b>1600</b>	<b>1600</b>	<b>1600</b>	<b>1600</b>
<b>Probability of Impact</b>		<b>19%</b>	<b>22%</b>	<b>9%</b>	<b>14%</b>	<b>9%</b>	<b>8%</b>

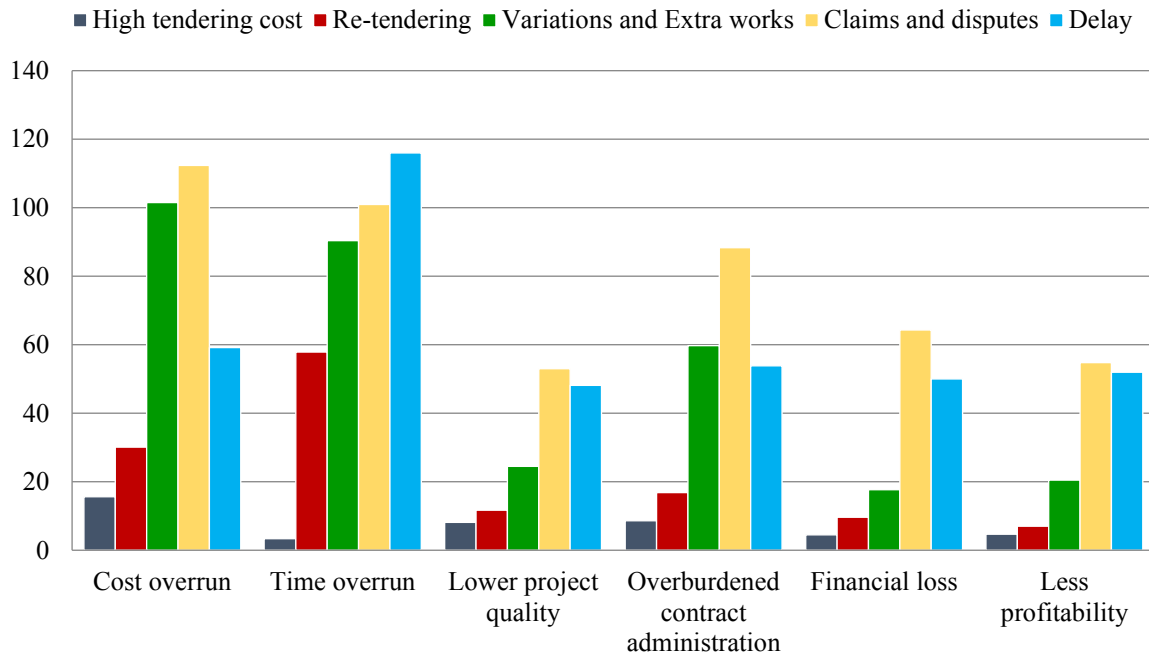


Figure 1: Comparison between Outcomes and Impacts

The comparison between all five outcomes in each impact as well as each outcome in all six impacts simultaneously. Above chart has drawn based on the impact values given in Table 3. Therefore, the height of a column represents the possibility of occur an impact due to an outcome.

According to Table 3 and Figure 1, it can be said that time overrun and the cost overrun are relatively most possible impacts among the others. As per findings from the literature, each outcome creates the impact in construction industry. Variations and extra works and claim and disputes are identified as most undesired outcome as it's create high level impact in construction projects. High tendering cost and Retendering provides comparatively low impact.

As per the literature review, financial loss and less probability were suggested by most of the authors. On the other hand, time overrun, cost overrun and overburdened contract administration were suggested by respondents. Respectively, lower project quality, financial loss and less probability took place.

#### 4.4. EFFECTIVE SOLUTIONS FOR MITIGATING THE IMPACT OF INEFFECTIVE TENDERING

According to Table 4, the solution 'Following the governing tender rules in proper way' has become the best solution to mitigate the impact of the ineffective tendering process being most significantly effective solution out of all the solutions. In that order, adhere proper code of conduct, managing future risk during the estimation process, drawn a special care on receipt, recording and assessment in the tendering process, and maintain a better communication during the tendering took place. The analysis stresses that none of the identified solutions are poorly and lowly effective with having the mode of 1 or 2. Similarly, based on the literature findings also, following the governing tender rules in proper way and adhere code of conduct & ethics were suggested by comparatively large number of authors than other solutions. Thus, following those solutions help to mitigate the drawbacks causing ineffective tendering.

Table 4: Analysis on Solution for Ineffective Tendering

No.	Solution	Mode
1	Following the governing tender rules in proper way	5
2	Adhere code of conduct & ethics	4
3	Managing the future risks during the estimating process by the bidders	4
4	Drawn a special care on receipt, recording and assessment in the tendering process	4
5	Maintain a better communication during the tendering	4
6	Requesting further information & clarification where the information is ambiguous	4
7	Using a good estimating package	4
8	Holding frequent audits in tendering process	4
9	Cost monitoring & controlling during construction with the cost plan of the tender	4
10	Not fully rely upon the information provided by the consultants	3

## 5. CONCLUSIONS AND RECOMMENDATIONS

Even though the tendering process is more important, less care and attention is drawn towards the tendering process by the practitioners that results several issues. This research has identified those issues as factors causing ineffective tendering process. Due to these factors, the effectiveness of the tendering process is decreased. Outcomes, impacts due to these factors and solutions to mitigate those factors are researched through this study.

According to the overall view of the professionals, time overrun, cost overrun and overburdened contract administration were identified as most critical impact on construction projects due to ineffective tendering. Claims and disputes, variations and Extra works and Delay are the undesirable outcome which causes those impacts.

Ineffective evaluation of received bids, Wrong selection of the tendering method, Issues in provided tendering information, Errors in the tender documents, Changes in the project requirements by the employer were identified as most critical factors which cause adverse outcome and impact on construction project.

Those factors or drawbacks need to be avoiding in tendering process to achieve proper tendering process and mitigate the impacts. This research recommends some solutions to overcome from these drawbacks such as following the governing tender rules in proper way, Adhere good code of conduct & ethics, managing the future risks during the estimating process by the bidders, drawn a special care on receipt, recording and assessment in the tendering process and Maintain a better communication during the tendering. These are the high ranked solution by the respondents as per the practical situation of the Sri Lankan construction industry. Thus, implementation of this strategy leads to achieve proper tendering process as well as successful projects.

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