Corruption in Sri Lankan Construction Industry

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Abstract

Construction industry plays a major role in the Sri Lankan economy. This research has been conducted to examine whether the construction industry of Sri Lanka is corrupted and is there any cost amplification due to corruption. In achieving the research aim and objectives, survey method was followed together with case studies where necessary. Data analysis was carried out mainly with the usage of statistical tools. Results show that the people involved in the sector believe that the construction industry of Sri Lanka is corrupted and corruption amplifies the cost of construction which finally cascade down to the general public. The research is also concerned about the situations where corruption occurs more frequently in the construction life cycles and the reasons for heavy presence of corruption within the industry. Further the researcher has identified the major effects of corruption. Through this research a model to calculate the cost amplification due to corruption has been formed and verified. With the foundation established, it is needed to concern more and discover suitable remedial measures to eliminate corruption from the Sri Lankan construction industry.

Keywords: corruption, construction industry of Sri Lanka, situations and reasons, effects, regression model

1. Introduction

Corruption is defined in a white paper by United States Agency for International Development (USAID 2008, p.4) as, "The misuse or abuse of entrusted power or authorities through practices such as embezzlement, fraud, extortion, bribery/kickbacks, nepotism or favouritism, including theft of state assets and diversion of state revenue, for their personal gain or of others connected to them."

CIOB (2006, p.23) states "It is apparent that corruption certainly did exist in the United Kingdom (UK) construction industry". Moderately, the studies done in countries like Africa (Schroth, and Sharma 2003), Hong Kong (ICAC, 1998), India (Vittal, 2002) and so on, have proved the identical reality. As Kawabena and Charity (2007, p.951) stated "The construction industry is often seen as a driver of economic growth especially in developing countries." In Sri Lanka, the Central Bank Reports (2005) bear the evidence, as almost 40% to 50% of the Gross Domestic Fixed Capital Formation and six percent to seven percent of the Gross Domestic Product is related with construction industry.

The link between the Sri Lankan construction industry and the impacts of corruption has not been scientifically recognized yet and needs to be found out immediately in order to cure and prevent its appalling effects on the economy as well as on society. Therefore this research is aimed to fill the identified knowledge gap.

2. Literature review

2.1 Corruption and Sri Lankan construction industry

Corruption comes in various forms. A study by Transparency International (2005, p.5) describes, "Construction projects normally have a large number of participants linked together in a complex contractual structure." As USAID (2006) stated, there is widespread perception that both public and private sector corruption is rife in Sri Lanka.

2.2 Situations prone to corruption in construction

Transparency International (2005, pp.39-42) has identified the instances where corruption may occur such as, the environmental impact assessment stage, when getting approval for public construction projects, contractor paying a fee to client's representative to secure the award of the contract, contractor bribes the consulting engineer who will advise the client that the briber's bid is the best, tender processes corrupted by international pressure, group of contractors ostensibly in competition may secretly collude, agreeing to share future projects between them so as to keep prices high, group of contractors bidding for a project may secretly agree that each will include a pre-agreed sum in their tender that reflects the estimated aggregate bidding costs of all the tenderers, group of suppliers of material may collude to fix the minimum price of the materials they supply or a bribe may be paid to a client's representative in order to obtain internal information on the expected budget, or to limit the number of bidders allowed..etc. Further, Kargbo (2006) describes these situations as awarding stage

of a contract, payment of bribes to win operation and maintenance contracts, making cost comparisons difficult, and increasing the opportunities for concealing bribes and inflating claims, in the bidding process may be linked to the over-specification of a project...etc. A study by TI – Bangladesh (2002) has uncovered corruption in procurement contracts in three forms.

In a study by SOFIMUN (2008, p.11), the significance of corruption is discussed follows:

"bid rigging occurs, shell companies are established, and procurement documents are falsified. Sub–standard materials are used in construction, regulators are paid off, and prices for infrastructure services are inflated."

These different studies explore a number of opportunities/ instances in which corruption can take place in the construction industry. Broadly these can be classified in to five areas as corruption in planning and design stage, in award of contract stage, in construction stage, in operation and maintenance and in procurement. Following section will highlight specific causes for corruption.

2.3 Causes for corruption in construction industry

According to Stansbury (2005 cited in TI, 2005) the inbuilt features of construction projects such as the number of contractual links and lack of due diligence ...etc makes them particularly prone to corruption. As discussed by Sum (2004) the Principal-Agent problem, complexity and uniqueness of output and its fragmented structure, the physical characteristics of construction output like large and heavy, complex unique and expensive and the fragmented structure ...etc are the causes for corruption. As Stansbury (2005 cited in TI, 2005) describes, uniqueness, lack of frequency of projects, entrenched national interests, government involvement with requiring numerous permits and no single organization governing the industry, number of phases makes project oversight difficult involving different management teams, cost of integrity, the complexity of projects ...etc are also create room for corruption.

Zou (2003) describes it as due to the large amount of money involved in a single transaction ...etc leads construction industry towards corruption. Banfield (1958 cited in Treisman, 2000) the "familism", which, in turn, may affect the level of nepotism (Treisman, 2000). According to Begovic (2003, pp.4-6), selfish interests of economic agents, law procedural legislation, complicated and non-transparent legislations and discretion of civil servants in the enforcement process, non presence of strong and unconstrained political will...etc creates a tremendous opportunity for corruption.

Chan (1998) argued that the causes for corruptive practices are discretionary power involving the decision-making, large number of approvals required, situations involving security or confidentiality that can be compromised and in situations where the standard operating rules and procedures are not clearly defined ...etc. Treisman (2000) explains that the greater flexibility in legal precedent, in countries with greater state intervention in the economy and corruption will be greater in countries that are more ethnically divided...etc. Kenny (2007, p.2) explains that, because the construction industry involves complex and because of its many close ties to government...etc, it is perhaps unsurprising that construction is frequently held up as one of the most corrupt industries worldwide.

The discretionary power of civil servants and decreased wages of civil servants ...etc is another important reason for corruption (Begovic, 2003).

These are the causes identified by various researchers which are being the reasons for corruption existence in the construction industry. The next section discusses about the effects of corruption.

2.4 Effects of corruption

A study by Mauro (1995 cited in Treisman, 2000) states the effects as the failures of certain "developing" countries to develop etc. As Transparency International (2005) describes, the cost of the bribes and false claims will often form part of the final contract price. As Khan (1998) explains the effects can reduce social value. In a study by Chan (1998, p.366-367) it was revealed that the most obvious effect is the directly incensement of the cost of a transaction and other legitimate considerations in the awarding and performance of contracts or in the provision of services. The result is that economic decisions are skewed; quality standards and safety are compromised.

Transparency International (2005) argues that aid to the developing countries will be cut back. As it has been pointed out by Begovic (2005), corruption violates the rule of law. Empirical studies by Kaufmann and Wei (1999) have shown the effects on economic growth, public expenditures, domestic and foreign investment, and the effect of corruption on driving firms to the unofficial economy. Begovic (2005) has identified that countries with widespread corruption cannot expect high growth rates. According to a report by Transparency International (2005), the consumers of a corrupted project will not receive the total expected output up to the quality.

As explained by Chan, (1998, p.367), the moral damage is perhaps more serious. According to Begovic (2005), corruption increases basic business uncertainty. According to Khan (1998), South Asian countries fit more closely with the perception that corruption is associated with poor performance. Corruption is not about an amount of money changing hands. It is about the future of the nation.

3. Aim and objectives

Aim of the research is to identify the impact of corruption in Sri Lankan Construction Industry. The objectives were to identify whether the construction industry of Sri Lanka is corrupted according to the views of the people who are involved in the sector, to understand the situations which are possible to encounter corruption, to investigate the dominant reasons leading towards corruption, to discover its effects in relation to Sri Lankan construction industry and to develop a model to calculate the cost of corruption.

4. Methodology

4.1 Data collection

The study was carried out through a review of the literature available in the field, specifically relating to the construction industry. A questionnaire survey and unstructured interviews were carried out as means of collecting data. The sample was selected based on clustering procedure consisting directors, of consultant, contractor and client organizations for the questionnaire survey and the area was limited to the Western province, being the commercial hub of Sri Lanka. Sixty questionnaires were distributed and the respondent rate was at fifty percent. A lacquered scale of one to five was given to rank the importance of points given in the questionnaire. Thirteen case studies were used for the model formation and verification. Both the documentary surveys and unstructured interviews were carried out to collect the data regarding the cases.

4.2 Method of analysis

The data collected were subjected to frequency and severity index (SI) analysis, Kendall's concordance test and to the chi-squared tests to establish a rank for the ordering of facts obtained with relevance to each and every objective. Further, the ranks obtained according to the median were considered to identify the most significant situations, reasons and the effects. When ranking according to the median if the same rank obtained for many then the first quartile and the third quartile respectively were considered to finalize the rank. In this study, the cost amplifying effects regarding which the data were collected were supposed to be exhibiting strong correlation coefficient when their $r > +/- 0.71$ (1990 Elifson *et al*, p.208). Further, variables need to have $r < 0.30$ among them to avoid the presence of multicollinearity effect. T-Distribution was used while testing hypothesis with individual partial regression coefficient for zero and non zero for null and alternative hypothesis respectively. If any of the individual partial coefficients accepts the null hypothesis at a certain confidence level, the model has eliminated it. The coefficient of determination ($\overline{R}^2$) adjusts the measure of explanatory power for the number of degrees of freedom. Identification of most significant independent variables was achieved by taking all T-Values for each and every coefficient regard to the imminence to the zero, lowest variables is rejected from the model and recalculate the formula. To obtain most significant variables, same procedure was iterated till the model comprises variables all of which partial regression coefficients are not equal to zero at a given level of significance.

5. Survey findings

5.1 Sri Lankan construction industry's view on corruption

Eighty percent of respondents claimed that they believe the Sri Lankan construction industry is corrupted. The figure 1 clearly exhibits the finding.
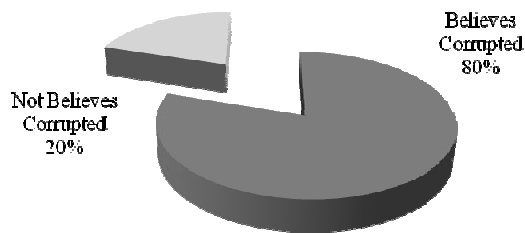
Figure 1-Whether the Industry is corrupted or not?

When considering the data collected in separated view points of the three categories, as illustrated in figure 2, there is a close similarity between the views of the respondent parties.
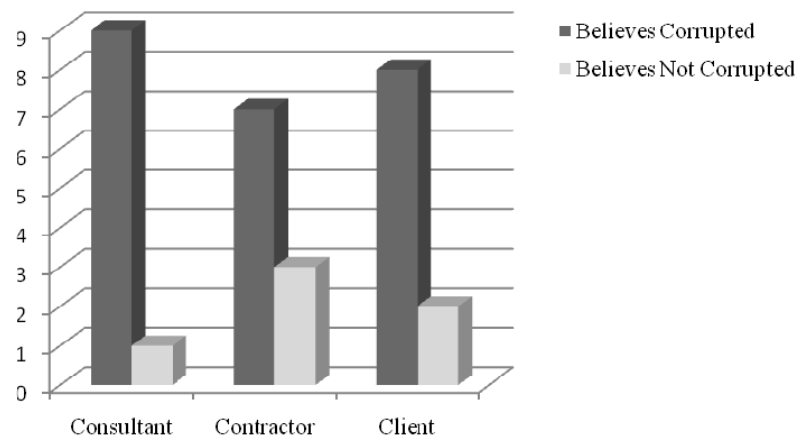

Figure 2-Whether the Industry is corrupted or not?-View according to parties

However, all the respondents agree with the fact that there is cost amplification in any case of corruption in the construction industry.

5.2 Selection of situations which are highly prone to corruption

Concerning both the Severity Indexes ranking and the ranks according to the median, considering the data set as a whole the followings were identified as the most significant frequent situations which lead to higher cost amplifications in the construction industry.

Table 1: Highly ranked situations

Rank ⟍ Situation	SI Rank	Median Rank
Approval of public construction Projects (Corruption in planning and design)	*1*	*1*
Contracts granted in response to political party influence (Award of contracts)	*1*	*1*
Group of contractors ostensibly in competition may collude, agreeing to share future projects so as to keep the prices high (Award of contracts)	*5*	*2*
Contractor bribes the consulting engineer who will advise the client in such a way to convince him that the briber's bid is the best (Award of contracts)	*8*	*3*
Contractors allocate too many staff on a claim, charge for many hours, give clients over-optimistic advice (Corruption during construction)	*1*	*1*
Checkers certify that defective or non-existent work is acceptable(Corruption during construction)	*3*	*2*
Client bribe the architect to falsely certify that the contractor delayed the project in order to deduct liquidated damages from payments to contractor (Corruption during construction)	*5*	*3*
High-technology projects, monopoly of supply during maintenance period, making the cost comparisons difficult (Corruption during operation and maintenance)	*1*	*1*
Corruption in the bidding process linked to over-specification of a project, which increases the costs of operation and maintenance (Corruption during operation and maintenance)	*3*	*2*
Payments for recommendation and approval of contracts (Corruption in Procurement)	*1*	*1*

5.3 Identification of the foremost reasons for corruption

After considering both the calculated Severity indexes for the reasons identified through the obtained data, ranks obtained from the three parties separately and the ranks obtained by the median consideration followings were identified as the most critical reasons for corruption in Sri Lankan construction industry.

Table 2: Highly ranked reasons

Rank ⟍ Reasons	SI Rank	Median Rank
Difficulty in monitoring expenditure	*1*	*1*
Government involvement requiring numerous permits	*2*	*3*
Non presence of strong and unconstrained political will	*3*	*4*
Lengthy and complicated construction process	*4*	*2*
Large amount of money involved in a single transaction	*5*	*6*
Discretionary power of civil servants	*10*	*5*

5.4 Detection of the drastic effects of corruption

Considering the Severity Index analysis rankings and the rankings from the median consideration the following effects were identified as the most drastic effects of corruption in relation to the construction industry of Sri Lanka.

Table 3: Highly ranked effects

Rank Effects	SI Rank	Median Rank
Loss of faith in the integrity of decision makers	*1*	*1*
Increased public expenditures	*2*	*3*
Low growth rates directly related to entrepreneurship and innovations	*7*	*2*
Reduction in social value	*5*	*4*
Damage to confidence, reputation and image	*9*	*5*
Wrong suppliers and/or contractors are selected; and material, quality standards and safety are compromised	*3*	*6*

5.5 Regression model formulation for cost amplification calculation

According to the statistical analysis results, corruption in procurement is maintaining a higher correlation coefficient with the other factors and thus it had to be eliminated from the model. All the other four areas have correlation coefficients higher than 0.71 with the dependent variable of the cost amplification due to corruption.

The first tentative model:

Cost Amplification due to Corruption = 2345 +0.09 cost of planning and design   + 0.12 cost of award of contracts + 0. 21 cost of construction + 0.14 cost of operation and maintenance

Model evaluation as a whole:

The ANOVA table which was created with the model has been used to evaluate the model as a whole.

Table 4: ANOVA table for 1st tentative model

Source Source	DF	SS	MS	F-value	P-value
Regression	*4*	*254369*	*63592*	*26.52*	*0.000*
Residual Error	*6*	*14386*	*2398*		
Total	*10*	*268755*			

The ANOVA procedure was used to test whether at least any one of the independent variables has a relationship with the dependent variable.

H0: All partial regression coefficients are equal to zero

H1: At least one partial regression coefficient is not equal to zero

According to the derived model, the degrees of freedom for which F-test needs to be performed are 4 and 6. At the 5% error level, F value of F0.05, 4,6 derived from the F distribution table was 4.53. Considering the fact that the F-value obtained from the model was 26.52, null hypothesis was rejected at the 95% confidence level. Therefore it can be understood that, out of the four independent variables used to the model, at least one variable having a partial regression which is not equal to zero has been rejected with 95% of certainty. Hence, at least one variable would have the explanatory power of the dependent variable.

Individual partial regression coefficient evaluation:

Every individual partial regression coefficients was tested with the T-test to ascertain the significance of each independent variable. The following table demonstrates the results received.

Table 5: Statistics of individual components of 1st tentative model

Predictor Variable	Coefficient	Standard Deviation	T-value	P-value
Constant	2344.965	60.67	0.03	0.003
Cost of planning and design	0.104	0.76	5.98	0.045
Cost of award of contracts	0.123	2.67	6.66	1
Cost of construction	0.221	1.90	6.96	142
Cost of operation and maintenance	0.140	1.54	8.37	142

The evaluation was done following the hypothesis.

H0: Individual partial regression coefficient of a variable is equal to zero

H1: Individual partial regression coefficient of a variable is not equal to zero

At the 95% confidence level the null hypothesis is rejected and consequently all four factors can be continued with the model. The other relevant statistics which are related with the coefficient determination were the S at 57.8975 and the R-Sq at 85.7%. Accordingly, the first tentative model can be identified as the finalized regression model given below for the research.

Finalized regression model:

Cost Amplification due to Corruption = 2345 +0.10 cost of planning and design + 0.12 cost of award of contracts + 0. 22 cost of construction + 0.14 cost of operation and maintenance

Consequently the four independent variables have received the VIFs summation is equal to 4.83 which is > 1 and <5. Therefore it is proven that the effect of multicollinearity is not an existing shortcoming of the concerned independent variables and the residuals are randomly dispersed in a normal distribution with a zero mean. The finalized model was tested with three separate corruption cases from the industry to measure the validity of the model.

6. Conclusions

The construction industry of Sri Lanka is a major sector of the economy. According to the research findings, a majority of eighty percent of the sample believes that the industry is prone to corruption. Hundred percent of the respondents accepted that corruption leads to cost amplifications. Hence the construction industry has created a burden of unnecessary cost to the general public through the corruption prevailing within the industry.

The approval of public construction projects at the planning and design stage, contracts given as a result of political party influence at the award of contracts stage, contractors allocate too many staff on a claim, charge for many hours, give clients over-optimistic advice at the construction stage, High-technology projects, monopoly of supply during maintenance period, making the cost comparisons difficult at the maintenance stage and the payments for recommendation and approval of contracts at the Procurement stage were the highest cost amplifying situations which frequently occur in the Sri Lankan Construction industry.

Since corruption and the due cost amplification are present, it is essential to identify the reasons for corruption. Therefore the probable reasons were outlined and were tested with statistics. According to the obtained results the ***difficulty in monitoring expenditure, government involvement requiring numerous permits, non presence of strong and unconstrained political will, lengthy and complicated construction process, large amount of money involved in a single transaction and the discretionary power of civil servants*** were the most significant and dominant reasons for the existence of corruption in the construction industry of the Sri Lanka. Realization of these reasons has a very high worth in relation to the mitigation of corruption.

In relation to the construction industry of Sri Lanka the most dangerous effects of corruption are ***the loss of faith in integrity of decision makers, increased public expenditures, low growth rates directly related to entrepreneurship and innovations, reduction in social value, damage to confidence, reputation and image, wrong suppliers and/or contractors are selected and material, compromised quality standards and safety.*** These are very detrimental issues in relation to the reputation of the whole industry as well as the financial system of the industry.

The cost amplification calculation model was finalised as;

Cost Amplification due to Corruption = 2345 +0.10 cost of planning and design + 0.12 cost of award of contracts + 0. 22 cost of construction + 0.14 cost of operation and maintenance

Sri Lanka, as a country which is developing in a rapid manner after ending the ethical war and exhibiting exceptional economic performances in such an era where the world economy is under a crisis, will surely be able to remove this hassle of corruption from the country. Therefore the researcher suggests the next step towards development of Sri Lanka is to fight to eliminate the corruption which will not only be a dream.

Acknowledgement

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