# The Effect of Winner's Curse on Post-Contract Management

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## Abstract

This study aims to identify whether there is an adverse effect to the client when a project is awarded to a bidder with a large winner's curse. The contractor is likely to run in to cash flow problems when he suffers from a large winner's curse. Therefore it is suspected that this would also have adverse effect to the client.

The study is interesting because large winner's curses are found to exist in Sri Lankan construction industry. Hence, some winning contracts may carry numerous problems due to very low or negative profits. The contractor may try to compensate his poor cash flow by submitting numerous claims and he may try to make profit by reducing the quality and time performance. Thus, this research intends to establish the relationship between the winner's curse and post contract management difficulties.

The research was designed as a correlation research with a survey based on 20 building projects. The winning bid range and winning margin are used to measure the winner's curse. Post contract management difficulties are measured using the contractor's claim attitude index.

The research finds that winning margin showed better correlation to claim attitude than the winning bid range. This indicates that the perceived winner's curse has higher impact than the real winner's curse on post contract management difficulties. Therefore the findings suggest that a client should be cautious when awarding the contract to a bidder with a large winning margin.

Keywords: Disaster Claim attitude index, Post contract management, Winner's curse, Winning bid range, Winning margin

## 1. Introduction

This paper presents a study conducted in Sri Lanka to identify whether there is an adverse effect to the client when a project is awarded to a bidder with a large winner's curse. The study is interesting because large winner's curses are found to exist in Sri Lankan construction industry [8] and the knowledge about their effect is limited.

## 1.1 Background

Awarding the contracts to the most appropriate contractor is one of the critical decisions to be taken by a construction client. This is very important to achieve successful project outcomes [11, 14, 15]. Awarding the contract to the lowest bidder is usually practiced in the public sector particularly because of its greater accountability. Many private clients also award contracts to the lowest bidder for cost reasons [4, 5, 6]. Therefore, the lowest bidder is typically the winner.

Successful bidders (that is, those who won the competition) tend to obtain returns that (on average) lie below initial projections. This discrepancy between realized and anticipated returns, and the possibility that winning bidders end up making losses, is called the winner's curse [1].

There is evidence that high probability for large winner's curse to exist in the Sri Lankan construction industry [7]. This means that the winning contracts shall either carry losses with below average profits or even negative profits. The contractor is likely to run in to cash flow problems when he suffers from a large winner's curse. Under the circumstance the contractor may try to compensate his poor cash flow by submitting numerous claims. He may also try to make profit by reducing time and quality performance [3]. Either context would lead to post contract management difficulties as the client and consultants would be required to take extra effort for corrective measures.

# 2. Winner's Curse

The Winner's Curse is a term originally apprehended in the oil industry and it described a phenomenon that occurred in common value auctions with incomplete information [2]. In common-value auctions, the value of the item is the same to everyone but different bidders have different estimates about the underlying value [9].

For example, an oil field had an actual intrinsic value of $10 million, oil companies might estimate its value to be anywhere from $5 million to $20 million. The bidder who erroneously estimated at $20 million would win in the auction, but will later find that it was not worth the amount he paid. Accordingly, even when a bidder's evaluations are correct on average, a bidder's evaluations on the tract he wins are not correct on average: they are biased upward [1]. If he wins, he loses money and thus he is cursed.

## 2.1 Winner's curse in the construction industry

Recall that the winner in the construction industry in competitive bidding is typically, the bidder who submits the lowest bid. When each bidder estimates the project cost and bids accordingly, the winner would probably be the bidder who has most underestimated project value. Thus he wins the contract and agrees to complete the project for a price which is less than the "right price" or the "true value" of the project. The winner therefore may become disappointed in the first instance of having largely underestimated; and later will look for means of rectifying it.

## 2.2 Detection of the winner's curse

The difference between the lowest and second lowest bids is often referred as "winner's curse." However, the correct quantitative measure of the winner's curse should be the difference between the "right price" of the project and the winning bid [13]. However, the "right price" is literally unknown and thus the measure is not practical.

To represent the winner's curse, winning margin is a useful measure. The term "winning margin" (*W*) is the difference between the second lowest bid and lowest bid. The "percentage-winning margin" (*PW*) is the ratio of the winning margin to the lowest bid and can be used to compare across projects of differing sizes [8]. These can be mathematically represented as:

$$W = (P_1 - P_0) \quad \text{, and}$$

$$PW = \frac{(P_1 - P_0)}{P_0} \times 100$$

where, P0 is the lowest bid and P1 is the second lowest bid. Since the winning margin is the obvious foregone profit to the winner, it represents the perceived winner's curse.

A recent study has shown that the winner's curse in the Sri Lankan industry is a serious issue. The average percentage-winning margin was equal to 9.323 [7]. This means that a second lowest bid is 9% larger than the lowest in general and this is significantly a high figure. The study further found that the distribution of bid prices was symmetrical and close to the normal distribution. Most of the bids were scattered closely around the average bid. With the conjecture that the majority is correct, the right price lies in the centre. When the lowest bid that lies in tail of the distribution, is the winning bid; there is a high probability for large winner's curse to exist.

With the presumption that the majority is correct, the winner's curse measured based on the average bid price would be a better representation of real winner's curse. Therefore to measure the winner's curse "winning bid range" (*B*) can be used and it is the difference between the average bid and the winning bid. The percentage- winning bid range (*PB*) is the ratio of the winning bid range to the winning bid. These are mathematically represented as

$$B = (P_a - P_w)$$

$$PB = \frac{(P_a - P_w)}{P_w} \times 100$$

Where, $P_a$ is the average bid and $P_w$ is the winning bid; and $P_w$ is equal to $P_0$ when the lowest is the winning bid.

# 3. Research Methodology

The research was design as a correlation research based on an industry survey. The sampling population was Sri Lankan building projects, which were awarded to Grade M4 or above contractors and completed during last five years. A random sample of 20 projects was used for collection of data. All data was abstracted from the project documents. Both winning margin and winning bid range were used to measure the winners curse.

The challenge was to measure the project management difficulties. Current literature did not produce an appropriate quantitative measure. Thus, it became necessary to unfold a new measure.

Claim management is one of the main issues of the post contract management activities. And also cost performance is one of the main concerns when considering the contractor's performance [12]. If the contractor runs into the cursed context and tries to rectify it at the expense of client's time and money; the key strategy he would use, is to make numerous claims [10]. This would yield additional paperwork and negotiations for client and his consultants; and also cause adversarial relationships. Therefore the contractor's Claims Attitude Index ($Y$) was identified to measure the level of post contract management difficulties. It was the ratio between the amount claimed for the contractual claims such as variations, fluctuations and cost headings under time extensions by the contractor, and the actual amount approved for payment:

$$\text{Claim attitude index } (Y) = \frac{\text{Quoted amount by contractor}}{\text{Approved amount}}$$

# 4. Data Analysis

The correlation between variables was tested using the Pearson Correlation Coefficient. Two independent variables: Percentage Winning Margin ($PW$) and Percentage Winning Bid Range ($PB$), were analysed for correlation with dependant variable: Claims Attitude Index ($Y$). The analysis results are presented in Table 1 below.

*Table 1: Pearson correlation analysis*

| Independent variables \ Dependent variable | | Claim Attitude Index (Y) |
|---|---|---|
| **Percentage Winning Bid Range (PB)** | Pearson correlation coefficient | 0.051 |
| | Confidence level (1- tailed) | 0.584 |
| **Percentage Winning Margin (PW)** | Pearson correlation coefficient | **0.274** |
| | Confidence level (1- tailed) | **0.856** |

Both independent variables (*PB* and *PW*) showed a positive correlation with the dependent variable (*Y*). However, PB showed poor level of correlation and confidence. Percentage Winning Margin (*PW*) showed a better level of correlation at 85.6% confidence level. Even though confidence level is little below the general statistical norms to conclude the correlation is significant; for a research of this nature, it is a significant figure.

# 5. Conclusions

The evidence of high probability for existence of large winner's curse in the Sri Lankan construction industry, urged the need to identify if a contractor with a large winner's curse is an adverse selection. The winners curse was quantitatively measured by two variables: Winning Margin and Winning Bid Range. Claims Attitude Index measured the post contract management difficulties to test whether the contractor is an adverse selection.

The Pearson Correlation Analysis results showed both the winning bid range and the winning margin are correlated positively with the claim attitude. Thus, the relationship between Winner's curse and post contract management difficulties found to be positive. Therefore, awarding a contract to a bidder with a larger winner's curse could be an adverse selection. However, the correlations are not significant enough to statistically theorise this as a fact. But, the results provide clear indication about the relationship.

The Pearson correlation coefficient was 0.051 between winning bid range and claim attitude with poor confidence level; but it was 0.274 between winning margin and claim attitude with confidence level of 85.6%.

Since the winning margin is a measure of perceived winner's curse; it can be now concluded that the perceived winner's curse has larger adverse impact to the post contract management

activities than that from the real winner's curse. This is because winning bid range, which is the selected measure for the real winner's curse shows a very weak relationship to the claim attitude. This is pragmatic because, the large perceived winner's curse gives the feeling to the contractor that he losses a significant amount from the contract. He would have bid 1$ less than the second lowest and still could win the contract. Thus, the Winning Margin is obviously a foregone profit.

With the conclusions of the research it is advised that a client should not award a contract to a bidder with a large winner's curse, especially when there is a large perceived curse.

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