Critical determinants of construction tender cost in New Zealand: Quantity surveyors’ standpoint

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Background

- High competition in construction industry
- Tender cost: Importance
- Cost estimating: experience based
- Construction cost:
  - Uncertain
  - Incompleteness
  - Unknown

Tender cost = actual cost + mark up

Actual cost: Labour + Material + Plant Cost

Mark up: Overhead + profit + risk

Qualitative cost influencing factors: Ignored

Few related research in New Zealand
Research Objectives

* Identify possible tender cost influencing factors
* Identify important factors in NZ market
* New forecasting estimating system
Research Method

* Literature review
* Quantitative research
* Online Questionnaire survey
* Target people: All members of NZIQS

Severity index: ranking importance of tendering cost factors

\[ SI = \left( \sum_{i=1}^{5} w_i \times f_i \right) \times \frac{100\%}{n} \]

- \( i \): rating 1 - 5
- \( f_i \): frequency of responses
- \( n \): total number for responses
- \( w_i \): the weight for each rating (2ed formula)

COV: Coefficient of variation for all participants

$COV = \frac{s}{\bar{X}} \times 100\%$

- $S$ = standard deviation
- $\bar{X}$ = weighted mean of sample

More than 150 valid questionnaires

COV: 12.71% ~ 25.91%

High agreement amongst participants
Project Characteristics

- Complexity: 65%
- Buildability: 70%
- Construction scope: 75%
- Construction techniques: 80%
- Construction location: 85%
- Project duration
- Type of construction
- Site storage limitation
- Type of structures
- Project size

Client Characteristics

- Financial ability: 65%
- Project brief certainty: 70%
- Deadline requirement: 75%
- Quality requirement: 80%
- Client Type: 85%
Contractor Characteristics

- Similar projects experience: 72%
- Management team: 74%
- Past relationship: 76%
- Current work load: 78%
- Need for work: 80%

Tendering Situation & Consultant & Design

Project information... 65%
Alterations & late change 70%
Procurement method 75%
Type of contract 80%
Tendering method 85%
Variation order

External factors & market condition

55% 60% 65% 70% 75% 80% 85%

- Level of competition
- Material cost
- Labour cost
- Number of bidders
- Market conditions Stability
- Inflation rate

Cost Estimating Inaccuracy

- Poor tender document: 70%
- Insufficient estimating time: 75%
- Insufficient analysing of tender document: 80%
- Shortage of project requirement standing: 85%

### Group Ranking

<table>
<thead>
<tr>
<th>Cost Estimating Inaccuracy</th>
<th>1</th>
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<tbody>
<tr>
<td>Client Characteristics</td>
<td>2</td>
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<tr>
<td>Contractor Characteristics</td>
<td>3</td>
</tr>
<tr>
<td>Project Characteristics</td>
<td>4</td>
</tr>
<tr>
<td>Tendering Situation &amp; Consultant &amp; Design</td>
<td>5</td>
</tr>
<tr>
<td>External Factors &amp; Market Conditions</td>
<td>6</td>
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</tbody>
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## Top 10 factors

<table>
<thead>
<tr>
<th>QS control</th>
<th>Other control</th>
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<tbody>
<tr>
<td>Poor tender document</td>
<td>Complexity of design and construction</td>
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<tr>
<td>Completeness of project information</td>
<td>Financial ability of client</td>
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<tr>
<td>Insufficient estimating time</td>
<td>Buildability</td>
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<tr>
<td>Certainty of project brief</td>
<td>Level of competition and construction activity</td>
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<tr>
<td>Deadline requirement</td>
<td></td>
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<tr>
<td>Insufficient analysing of tender document</td>
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Implication of Findings

- Enrich competition of QS
- More accurate and reliable tendering estimating
- Cost control

To practitioners & organisations:

* Some important factors: ignored
* Time-consuming & costly
* New cost estimating system
Conclusion

* Top 3 factors
  1. Poor tender documentation
  2. Complexity of design and construction
  3. Completeness of project information

* Cost Estimating Inaccuracy (Most important group)
* Enrich competition
* More reliable cost estimating
* New cost estimating system