

2006/45  
10/01/2013

# CAUSES AND EFFECTS OF CONTRACTOR ORIENTED COST OVERRUNS IN BUILDING PROJECT

Kandiah Chandramohan

08/8855



University of Moratuwa, Sri Lanka.  
Master of Science in  
Electronic Theses & Dissertations  
Construction Project Management  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

Department of Civil Engineering

University of Moratuwa  
Sri Lanka

April 2013

10029  
1  
08/12/13

# CAUSES AND EFFECTS OF CONTRACTOR ORIENTED COST OVERRUNS IN BUILDING PROJECT

Kandiah Chandramohan

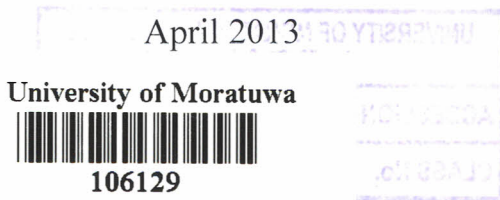
08/8855



Dissertation submitted in partial fulfillment of the  
Requirements for the degree Master of Science

Department of Civil Engineering

University of Moratuwa  
Sri Lanka



624 "13"  
-----  
69 : 005.8(043)  
106129  
+  
CD-ROM

## DECLARATION

I declare that, this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published, or written by another person, except where the acknowledgement is made in the text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works.



K.CHANDRAMOHAN.  
(MSc/CPM/08/8855)



Date.

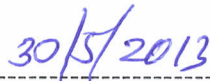


University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

The above candidate has carried out research for the Dissertation under my supervision.

### ***UOM Verified Signature***

Prof.A.A.D.A.J.Perera. (Research Supervisor)  
Department of Civil Engineering,  
University of Moratuwa



Date.



## ABSTRACT

One of the main problems, faced by the construction industry is cost overrun. The final cost at the completion of the project exceeds over the initial cost, during the time of inception of the project. As a result of this, the projects have to be stopped or reduced their scopes, without fulfilling the total requirements of the end users. So, it is necessary to analyze the main causes for the cost overrun in construction projects.

After the end of thirty years of war and recent Tsunami, there are many reconstruction projects, especially in building sector undergoing in Sri Lanka. It is observed that the cost overrun at the end of the project, created unpleasant situations among the clients, consultants and contractors. The contractors are the most affected by the issue of cost overrun, because they have to wait for their payments for a certain period due to the unavailability of excess fund.

The aim of the research project is to identify the main factors contributing the cost overrun in the view of contractors and how they are distributed. The other focusing area of this study is to find out the steps to mitigate the cost overrun in future.

The preliminary data for this research have been collected through a literature review from Sri Lanka and worldwide. The main factors causing cost overrun listed from the literature review, were modified using the facts obtained from the case studies and the opinions of some experts in the field. An article questionnaire form has been prepared using the modified factors and circulated island wide. 77 questionnaires were received, out of 180 issued questionnaires and the response rate of 43%. The data analysis was carried out using the relative importance index method. The Five point priority scale was used to rank the significant factors according to the rating of respondents. In addition to that, an open ended question was added in the last part of the questionnaire form to get the views of the mitigation of cost overrun in future.

From the results, "Cost due to extra work" is identified as the top most influencing factor of cost overrun in overall basis. "Cost due to extra quantity", "Changes in design", "Changes in scope", "Cost due to adverse weather" and "Price fluctuation of materials" are identified as the next five significant factors. The analysis was further carried out in relation with the project size and the type of the fund and almost similar results were obtained.

In the case of remedial measures of cost overrun, the respondents suggests that the adoption of proper planning and using efficient methods in estimate preparation are the best solution for avoiding the cost overrun in future. They further stress that the frequent changes in scope are to be avoided, in order to keep the contract value in control.

## ACKNOWLEDGEMENT

I wish to express my sincere gratitude to the Department of Civil Engineering, University of Moratuwa for offering the valuable opportunity to conduct this research study on “Causes and effects of contractor oriented cost overruns in building projects.”

I express my sincere gratitude to my research supervisor, Prof.A.A.D.A,J.Perera, Senior Lecturer, Department of Civil Engineering, University of Moratuwa, for his continuous assistance, guidance, encouragement and kindness rendered throughout the period of this study. Also I wish to extend my similar gratitude to Dr. L.L.Ekanayake, Dr.R.U.Halwatura and other academic staff of Department of Civil Engineering for their cooperation extended during the research project. I shall also thank the non academic staff of Department of Civil Engineering for their assistance and coordination provided during this period.



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations

[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

I express my sincere thanks to my supervisor, Eng.A.Velmanikam, Provincial Director of Buildings, Eastern Province and my fellow Engineers for their numerous supports extended during this period.

Also I wish to express my sincere gratitude to the contractors in Trincomalee, Batticaloa and Ampara Districts, who scarified their valuable time in helping me during the time of pilot study and questionnaire survey. Further I extend my appreciation to all contractors island wide who responded the questionnaire survey without hesitation.

Last but not least, I extent my sincere thanks to my staff in Department of Buildings in Trincomalee for their endless assistance, my friends, batch mates and family members who gives courage and guidance to make this event a success.

## CONTENTS

Declaration.....	ii
Abstract.....	iii
Acknowledgement.....	iv
List of Tables.....	ix
List of Figures.....	x
Abbreviations.....	xi
Chapter One –Introduction.....	01
1.1 Background.....	01
1.2 Cost overrun in Projects.....	02
1.2.1 Pre contract cost overrun.....	02
1.2.2 Post Contract overrun.....	02
1.2.3 Technical based cost overrun.....	03
1.2.4 Psychological based cost overrun.....	03
1.2.5 Political based cost overrun.....	03
1.2.6 Economical based cost overrun.....	03
1.2.7 Length of the project implementation phase.....	03
1.2.6 Size of the project.....	04
1.2.7 Type of Project ownership.....	04
1.3 Problem state me.....	04
1.4 Research Objective.....	05
1.5 Research method.....	05



1.6	Limitations of the Project.....	06
1.7	Framework of the study.....	07
1.8	Organization of the report.....	08
	Chapter Two- Literature Review.....	09
2.1	Introduction.....	09
2.2	Past studies of cost overrun in worldwide.....	10
2.3	Studies carried out in Sri Lankan Context.....	14
2.4	Identification of key factors of cost overrun.....	17
2.4.1	Client related factors.....	20
2.4.2	Consultant related factors.....	20
2.4.3	Contractor related factors.....	21
2.4.4	External factors.....	22
2.5	Role of Contractor.....	23
2.6	Summary.....	24
	Chapter Three- Methodology and Data Collection.....	25
3.1	Introduction.....	25
3.2	Methodology.....	25
3.3	Data collection.....	26
3.3.1	Identification of Information.....	26
3.3.2	Identification of sources of data.....	27
3.3.2.1	Primary data.....	27
3.3.2.2	Secondary data.....	27
3.4	Selection of Target Group.....	27



University of Moratuwa, Sri Lanka.  
 Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

3.5 Method of data collection.....	28
3.5.1 Literature Review.....	28
3.5.2 Case study.....	31
3.5.3 Interviewing.....	31
3.5.4 Questionnaires.....	32
3.6 Sampling.....	36
3.6.1 Simple random sampling.....	37
3.6.2 Systematic sampling.....	37
3.6.3 Stratified random sampling.....	37
3.6.4 Quota sampling.....	37
3.7 Population Vs Sampling.....	38
3.8 Sampling and Data collection.....	38
3.9 Summary.....	39
Chapter Four- Data Analysis and Discussion.....	41
4.1 Methods of Data Analysis.....	41
4.2 Selection of Data Analysis Method.....	42
4.3 Selection of Data Analysis Method.....	43
4.4 Results and Discussion.....	51
4.4.1 Identification of the most significant cost overrun factors.....	52
4.4.2 Effect of the project size on cost overrun factors.....	57
4.4.3 Effect on ownership on cost overrun.....	58
4.4.4 Effect on Procurement method on cost overrun factors.....	58
4.4.5 Possible remedial measures of avoiding cost overrun.....	59



University of Moratuwa, Sri Lanka.  
 Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)



4.5 Summary.....	59
Chapter Five- Conclusions and Recommendations.....	61
5.1 Conclusions.....	61
5.2 Comparison with other research works.....	61
5.3 Recommendations.....	62
5.3.1 Avoid Changes.....	62
5.3.2 Avoid Delays.....	63
5.3.3 Ensure the availability of funds.....	63
5.3.4 Competent personnel.....	63
5.3.5 Continuous monitoring.....	64
5.3.6 Capacity Building.....	64
5.3.7 Project Evaluation.....	64
References.....	65
Annexure.....	69
Annexure 1: Model Questionnaire Form.....	69
Annexure 2; Summarization of data obtained in data collection.....	73



University of Moratuwa, Sri Lanka.  
 Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

## List of tables

Table 2.01-Summary of Literature Review in Worldwide context.....	18
Table 2.02-Summary of Literature Review in Sri Lankan Context.....	19
Table 3.01 Key factors of cost overrun from literature review.....	33
Table 3.02 Cost overrun factors after case studies and expert discussions .....	35
Table 3.03 The distribution of questionnaires and the responses.....	39
Table 4.01 Responses regarding the project size.....	43
Table 4.02 Responses regarding the type of contract.....	43
Table 4.03 Responses regarding the funding.....	44
Table 4.04 Relative important index and respective ranks for each factor on overall basis.....	45
Table 4.05 Relative important index and respective ranks for the projects of value less than 20 Mn.....	46
Table 4.06 Relative important index and respective ranks for the projects of value between 20Mn-100Mn.....	47
Table 4.07 Relative important index and respective ranks for the projects of value greater than 100Mn.....	48
Table 4.08 Relative important index and respective ranks for GOSL funded projects GOS.....	49
Table 4.09 Relative important index and respective ranks for the projects funded by Donors.....	50
Table 4.10 The educational background of the respondents.....	51
Table 4.11 The experience of the respondents in the construction field.....	51

## List of figures

Figure 01 The main process of the research.....07



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)



## ABBREVIATIONS

BOQ -Bill of Quantities

GOSL -Government of Sri Lanka

ICTAD -Institute for the Construction Training and Development

TEC -Total Estimated Cost

RII -Relative Importance Index

RIW -Relative Importance Weight

WA -Weighted Average



University of Moratuwa, Sri Lanka.  
Electronic Theses & Dissertations  
[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)