

Construction Claims' Impacts on Project Performance Baselines

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Abstract

Nowadays claims in construction projects became usual and expected during the construction procedure. In addition, claims are the most disruptive and unpleasant events of construction projects because of their impacts on project final cost and scheduled completion date. This study, as one of chain researches on construction claim management (the other researches were directed to study types of claims, the causes and the best management approach to prevent their impacts), identifies impacts of claims on construction projects in Jordanian construction industry. The actual data regarding claims and their impacts have been collected by using a questionnaire form distributed to selected number of stakeholders (clients, contractors, project managers) and arbitrators. In addition, more investigation were done on actual data collected from real life projects as case studies of actual claims up raised by contractors of finished construction projects. This study is expected to assist both, project management and contractors in identifying and manage contractual claims to mitigate their impacts on projects' completion costs and time.

Keywords: Construction management, claim management, project management, construction claims

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INTRODUCTION

Unfortunately claims in construction projects become a way of life. It is an indispensable part of most of construction contracts. They are considered by many project participants to be one of the most disruptive and unpleasant events of a projects^[1].

Construction claims may involve numerous issues as a result of; stakeholders behavior, engineer, designer and contractor and affected construction process, and that leads to disruption and conflicts between project parties with possibility of changes in the project scope, schedule and cost baselines^[2].

Early notification of expected claims has advantage of minimizing and even avoiding the impacts of such potential

claims, and that will prevent any possibility of changes in any of project performance baselines.

IMPACTS OF CLAIMS ON CONSTRUCTION PROJECTS

Many studies have researched the impacts of claims on construction projects which came out with conclusion that the impacts of claims vary from one construction project to another, based on different criteria.

Sample identified that half of construction claims that happened in construction projects in Canada constitute additional amount to the original contract cost by more than 30%, in addition to that, about one third of construction claims amounted at least 60% of the origin contract value^[3].

Another study has classified impacts of claims on construction projects to the following categories: changes in project performance baselines (scope, schedule and cost baselines), disturbing construction operations, changes in functions of projects, conflicts between project stakeholders, affecting contractor reputation, and finally changes in the required quality of project deliverables and products^[4]. Toor and Ogunlana had studied the problems that cause claims in large construction projects in Thailand and their impacts on project performance^[5].

They concluded that the main impacts were on the performance baselines of cost and schedule. In Oman Al-Mohsin found that construction claims extended completion time of construction projects by up to 75% to its original scheduled completion date^[6]. Al Jaloudi has done a research to evaluate the water and wastewater construction projects variations in Jordan^[7]. The research found that the most important two impacts of claims were the completion schedule delay (time delays) and increase in the project cost (cost overrun).

The literature review of the previous researches has classified the impacts of claims on construction projects to^[4];

1. Project performance baselines (scope, schedule and cost baselines).
2. Project stakeholders' relationship.
3. Operations progressing.
4. Quality of deliverables and products.
5. Possibility of conflicts between stakeholders.

This study has been conducted to concentrate only on two impacts of construction claims; project performance baselines (schedule and cost baselines), as they are usually the most essential concern of the projects' stakeholders.

SCOPE OF THE STUDY

To identify the real impacts of claims construction industry in Jordan (as a case

study), the scope of the study has been divided into two parts. The first part is conducted to collect actual data of existing claims and their impacts from twelve selected real existing construction projects in Jordan. The collected data then analyzed to identify types of claims, their impacts, and how they were settled. The selected projects were given alphabetic symbols for confidentiality reasons.

The second part of the study was conducted as a field survey in a form of a questionnaire which contains list of questions that were distributed to 153 of selected project stakeholders (clients, project managers, contractors and arbitrators). The responses to the questionnaire form were then collected, analyzed and evaluated to identify the actual impacts of claims on construction projects in Jordan, to be added to the results of the first party of the study.

Categorical scale was used as percentage of original project cost and time, which has two questions; cost and time questions, each of them divided into six answers that show impacts of claims in building projects in Jordan as percentage started by less than 10% and ended by more than 100%.

CHARACTERISTICS OF THE SELECTED EXISTING CONSTRUCTION PROJECTS

Twelve construction projects have been selected to collect actual data from regarding claims incurred in them, their types, causes and impacts on these projects performance baselines (cost and schedule). The characteristics of these projects are shown in Table 1.

SIZE AND CHARACTERISTICS OF THE RESEARCH SAMPLE

More than 153 questionnaire forms were distributed, only 153 were responded which was considered as the sample size in the study. The selection of the research

sample was based on selecting population size from Grade (A) of construction contractors and Grade (A) of consulting engineers in Jordanian construction

industry classification. The sample of 153 participants was distributed as 11 owners, 50 consulting engineers, 77 contractors, and 15 were arbitrators.

Table 1: Characteristics of the Selected Construction Projects.

Project Code	Type of the Project Work	Type of Contract Conditions	Type of Contract	Project Original Cost (JD*)	Project Duration (Days)
A	Residential Building	Jordanian	Unit Price	2500000	1095
B	Residential Building	Jordanian	Unit price	240000	120
C	High Rise Commercial Building	FIDIC 99 (international)	Lump sum	5000000	365
D	Commercial offices Building	Jordanian	Lump sum	20000000	730
E	Shopping Center	Jordanian	Unit price	1578675	270
F	Residential Complex Project	FIDIC 99 (International)	Unit price and lump sum	7279806	304
G	School Building	FIDIC 99 (International)	Unit price	7000000	274
H	University Complex Project	FIDIC 99 (International)	Unit price	14000000	365
I	University Students Residential Buildings	FIDIC 99 (International)	Unit price	5000000	304
J	Residential Housing Complex	Jordanian	Lump sum	5299424	456
K	Civil Services for residential Buildings	Jordanian	Unit price	2000000	183
L	Commercial Offices Building	Jordanian	Unit price	18000000	240

*JD=\$1.75 CND.

The characteristics of the sample have been identified from the responses of the participants on the questions in the general information section as follows;

1. The academic qualification of participant distributed as; 77.8% of respondents holding BSc degree, while 19% holding MSc degree and 3.2% holding Ph.D. degree.
2. For the experience level among the participants, the responses showed that 7.9% have site experiences between 6 and 10 years, 9.5% have 11 and 15 years of experience; where as 82.5% of the participants have more than 15 years of site experience.
3. The responses on a question regarding the type of contracts they usually award their projects showed that unit price contract and lump sum contract were the most common type in use by building projects in Jordan, while

cost reimbursable contracts are rarely in use in Jordan.

DATA ANALYSIS OF SELECTED REAL EXISTING CONSTRUCTION PROJECTS

The impacts of claims on the selected existing construction projects were identified as changes in project cost and time performance baselines.

Impact of Claims on Project Cost Baseline

The data analysis of the selected projects, as shown in Table 2, has identified that;

1. All the selected projects were unit price contracts, except project F, which was unit price and lump sum at the same time.
2. Total claims cost impact percentage on original project cost is less than 10%, except in two projects where it reached

- to 50 and 13% respectively of the project original cost.
- The analysis indicates that there is a difference between the claimed cost

and what was approved by the project manager, except in one project when the claimed cost was approved exactly as claimed.

Table 2: Claims Cost Impact on the Selected Projects.

Project Name	Type of Contract	Project Original Cost JD*	Cost of Claims as Demanded JD*	Cost of Claims as Approved JD*	% of Claimed Cost to Original Project Cost	% of claimed Cost to Approved Cost	% of settled Cost to Original Project Cost
A	Unit Price	2500000	600000	40000	24	6.7	1.6
B	Unit price	240000	120000	120000	50	100	50
C	Lump sum	5000000	150000	0	14	0	0
D	Lump sum	20000000	0	0	0	0	0
E	Unit price	1578675	150000	100000	9.5	66.7	6.3
F	Unit price and lump sum	7279806	1700000	500000	23.4	29.4	6.9
G	Unit price	7000000	300000	0	4.3	0	0
H	Unit price	14000000	230000	0	1.6	0	0
I	Unit price	5000000	100000	0	2.0	0	0
J	Lump sum	5299424	1000000	700000	18.9	70	13.2
K	Unit price	2000000	0	0	0	0	0
L	Unit price	18000000	1000000	0	5.6	0	0

*JD: Jordanian Dinner=\$1.75 CND.

Impact of Claims on Project Schedule Baseline

The claims have impacts on the twelve selected project schedule baseline more

than cost, as shown in Table 3. Analysis of the collected data from the twelve selected projects has identified that:

Table 3: Claims of Total Time Impact on the Selected Projects.

Project Name	Type of Project Contracts	Project Duration Days	Claimed Time Days	Settled Time Days	% of Claimed Time to Original Project Duration	% of Claimed Days to Settled Days	% of Settled Days to Original Project Duration
A	Unit Price	1095	183	183	16.7	100	16.7
B	Unit price	120	120	60	100	50	50
C	Lump sum	365	91	91	24.9	100	24.9
D	Lump sum	730	365	365	50	100	50
E	Unit price	270	43	43	15.9	100	15.9
F	Unit price and lump sum	304	120	120	39.5	100	39.5
G	Unit price	274	205	205	74.8	100	74.8
H	Unit price	365	425	425	116.4	100	116.4
I	Unit price	304	183	183	60.2	100	60.2
J	Lump sum	456	183	183	40.1	100	40.1
K	Unit price	183	121	121	66.1	100	66.1
L	Unit price	240	120	120	50	100	50

*JD: Jordanian Dinner=\$1.75 CND

- Three projects were extended in their duration by less than 25%, whereas five projects had time extension between 25 and 50%, and the rest four

- projects had more than 50% extension in time of the project original duration.
- It can be noticed also that all the claims of time extension had been

approved in eleven projects out of twelve selected projects.

3. Many contractors agreed to concentrate their claims on having extension in time rather than extra cost. An extension in time will protect them from paying penalties.
4. On the other side, there was no relation between type of contract and cost or time impacts of claim for the selected projects, but it was shown that the unit

price contract were most of repeated contract types in twelve projects.

DATA ANALYSIS OF SELECTED STAKEHOLDERS' RESPONSE TO FIELD SURVEY

Impact of Claims on Project Original Cost

Data analysis of the responses of the selected 153 stakeholders to the distributed questionnaire forms, as shown in Table 4, shows that:

Table 4: Claims Impact on Construction Projects Original Cost.

Impact of Claims	Category	Client	Project Manager	Contractor	Arbitrator	Total
Changes in project cost baseline	<10%	0.0	27.3	17.4	18.2	19.0
	10 – <25%	100.0	59.1	60.9	54.5	63.5
	25 – <50%	0.0	13.6	21.7	18.2	15.9
	50 – <75%	0.0	0.0	0.0	9.1	1.6
	75 – <100%	0.0	0.0	0.0	0.0	0.0
	>100%	0.0	0.0	0.0	0.0	0.0

1. 63.5% of the responses agreed that the Impact of claims caused the original project cost to increase from 10 to over 25%, while 19 of the responses agreed that the claim causes the cost to increase to less than 10%. Only one response mentioned that the claim could cause an increase between 50 and 75%.
2. All the responses of the participated clients agreed that the claims increase project original cost between 10 and 25%. While 59% of the responses of participated project managers agreed on that, and 27% of them agreed that claims usually increase project original cost by less than 10%, and the rest of project managers consider that

construction claims increase project cost between 25 and 50%.

3. 61% of the responses of the participated contractors agreed that the claims increase project cost between 10 and 25%.
4. Also 55% of the responses of the participated arbitrators agreed that the claims increase project cost between 10 and 25%, and only 9% of arbitrators agreed that claims increase project original cost between 50 and 75%.

Impact of Claims on Project Schedule Baseline

Analysis of the responses of the 153 participants on the impact of claims on project's duration has come out with the following remarks, as shown in Table 5.

Table 5: Impact of Claims on Project Schedule Baseline.

Impact of Claims	Category	Clients	Project Manager	Contractor	Arbitrator	Total
Extending in Project Schedule Baseline	<10%	0.0	13.6	8.7	0.0	7.9
	10 – <25%	28.6	50.0	26.1	27.3	34.9
	25 – <50%	14.3	31.8	47.8	45.5	38.1
	50 – <75%	14.3	0.0	8.7	9.1	6.3
	75 – <100%	28.6	4.5	8.7	0.0	7.9
	>100%	14.3	0.0	0.0	18.2	4.8

1. 38.1% of the total responses agreed that claims usually increase completion time from 25 to less than 50%, while 34.9% of the total responses agreed that claims increase completion time between 10 and 25%.
2. 28.6% of the responses of the participated clients agreed that claims increase completion time between 10 and 25%. The same percentage of participants of clients agreed that construction claims can increase completion time by 75–100%. The other responses agreed claims can increase completion time between 25 and 75%.
3. 50% of the responses of the participated project managers consider that claims increase project completion time between 10 and 25%. While 32% of the responses agreed that claims usually increase project duration between 25 and 50%.
4. 48% of contractors and 46% of arbitrators agreed that claims usually increase project completion time between 25 and 50%.
5. 14.3% of the clients' responses and 18.2% of Arbitrators' responses agreed that claims can increase project completion time up to 100%, or even more.

CONCLUSION

The study has come out with significant conclusions. The main construction claim impacts on the project in Jordanian construction industry are changing performance baselines of project cost and schedule. It is also concluded that the contractors concentrate their claims on

having extension in time rather than extra cost, as an extension in time will protect them from paying penalties. The other reason for making the contractors are concentrating in their claims on extension in time; is that because it is rarely that they get what they claimed of extra cost, while they usually get what they claimed of extension in time. The other conclusion is that the type of contract does not have any influence on the impact of claims, as most of the researched projects were of unit price contract.

It is also concluded that the schedule impact of construction claims has higher influence than that the cost impact on the construction project in Jordanian construction industry. Settlement of claims by project management is usually much less than what contractors are usually claiming for.

Cost claims increase project expected costs between 10 and 25% as most of the participants agreed on these percentages, while time claims can increase project completion time up to 50%, and even arbitrators expect such claims can increase the time up to 100%, or even more.

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