Avoiding Claims in Egyptian Construction Projects: A Quantitative Survey

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Abstract

Construction claims are considered by many project participants to be one of the most disruptive and unpleasant events of a project. It is commonly recognized that the number of construction claims and disputes has been increasing and has become a burden to the construction industry. Avoiding claims and disputes requires the understanding of the causes of such claims. The purpose of this research is to quantitatively identify the causes of contractor claims in Egypt and suggesting methods of avoiding them. To achieve this objective, a literature review was conducted to identify the causes of claims in international literature, and a list of claim causes was synthesized. A questionnaire survey quantitatively evaluated the modified claim causes and investigated methods of avoiding / reducing them. The top reason for claims was found to be variations initiated by consultant / owner. Furthermore, suggestions to avoid claims include: using an appropriate and balanced contract; giving special consideration for contract clauses dealing with variations, disputes, inspections, approvals, payments and delays; and allowance for reasonable time for completion of design.

Keywords: Claims Avoidance; Construction; Questionnaire Survey; Egypt; Variations.

Introduction

Claims are considered one of the most important items that could cause a harmful effect in organizations and in the construction industry. Claims can be frequent in large projects and can cause budgetary difficulties to employers. They may cause financial difficulties, restriction of cash flow, and loss of liquidity to contractors. Claims in construction contracts may be defined as a request or application for something or notification of presumed entitlement to which the contractor considers, believes or contends (Revay 1990). The number of construction claims has been increasing and are in general a time consuming and costly element in construction projects. The increasing number of international companies contemplating construction projects in Egypt, in addition to the significant problems with regards to claims propagation and management, have given relevance to the studying of causes, management and efficiency of construction claims (Basha el al. 2007; Hassanein and El Nemr 2008). Adversarial approaches to public and private sectors of the construction industry in Egypt generate a substantial increase in the use of litigation and arbitration for the settlement of disputes (Marzouk, El-Mesteckawi, and El-Said 2011). Furthermore, claims recovery policy can have a considerable effect on bid profit reduction in Egypt (Mohamed, Khoury and Hafez 2010). Accordingly, the study of construction claims and their causes in Egypt are quite relevant to construction firms

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and developers working in the Egyptian market. Egyptian organizations should equip themselves to deal with claims efficiently, expeditiously and minimize the cost in terms of both money and staff resources. International literatures have researched the causes of claims and have proposed recommendations for avoiding them (Ip 2002). However, the Egyptian culture and nature of its construction industry has different characteristics, and therefore these causes might not be applicable. Avoiding claims need firstly, to define the causes of claims in the context of the Egyptian construction industry then suggest methods of avoiding them. Accordingly, the objective of this paper is to identify the major causes of claims produced by contractors towards owners in the Egyptian construction industry, and to quantitatively asses the relative importance of these causes from the different points of view of owners, consultants, and contractor. The paper is also to browse the participant's propositions, on how to avoid causes of claims.

The paper contains four further sections. First, the causes of claims in literature are then discussed, where a list of claim causes is reviewed. Second the administration of a questionnaire survey is discussed. Third the results of a questionnaire survey are reported to quantitatively rank the causes of claims and browse participant's suggestions as how to avoid them. Finally, a conclusion, recommendations and further work are discussed.

Causes of Claims in Literature

A plethora of authors have researched claims in international literature and analyzed their causes (Al-Momani 2000; Adrian 1993; Diekmann and Nelson 1985; Jergeas et al. 1994; Kumaraswamy and Yogeswaran 1998; Mcmullan 2003; and Semple et al.; 1994). As a result of the special nature of the Egyptian market in terms of the project parties' attitudes and the cultural, political and business environment, causes of claims may differ from other countries worldwide. A synthesis of the causes of claims in international literature has been presented in Abd El-Razek, Bassioni and Abd El-Salam (2007) and modified according to the Egyptian construction industry using semi-structured interviews with 10 experts. The results were in line with the findings of Awad (2005). Table 1 shows the modified causes of claims as per Egyptian construction.

Table 1: Modified Causes of Claims as Per Egyptian Construction

No.	Causes of claims
1	Delays in payments to contractors and resulting cash problems during construction
2	Inferior quality of design, drawings and / or specifications
3	The contract documents have errors, defects and omissions
4	Delays of approval of shop drawings, instructions and decision making
5	Restricted access
6	Faulty and / or late Owner-supplied equipment and material
7	Unbalanced bidding , underestimation and incompetence of contractors
8	Stakeholders involved in the project
9	Relatively low profitability of the construction industry
10	Variations initiated by the owner/consultant (additive/deductive)
11	Acceleration and stop-and-go operations
12	Insufficient time for bid preparation and inadequate investigation before bidding
13	Changed conditions
14	Increase of complexity and scale of building process
15	Delay of Owner representative/ consultant in inspection work
16	Unexpected changes in exchange, interest, and inflation rate
17	Unexpected change in materials prices

Questionnaire Survey

The objective of the questionnaire survey is to measure the importance of each claim cause from the different points of view of project parties (contractor, owner and consultant). The objective is also to collect participants' responses on how to avoid the causes of claims. The degree of importance can be estimated through knowing the probability of occurrence of the cause and power of cause to deliver a claim. Multiplying the probability of occurrence by power of the cause can indicate the degree of importance.

Questionnaire Design

Questionnaire design is a long process that demands careful attention. A questionnaire is a powerful evaluation tool and should not be taken lightly. A questionnaire was designed in this research according to the modified list of causes. The questionnaire consists of four parts, as follows:

Part One

Contains the respondent's personal information, position, and work information.

Part Two

Contains sections for causes related to owner/consultant, contractor, and external conditions. In each section the respondent is asked to evaluate each cause of claims according to the probability of occurrence and power to produce a claim on a Likert scale in responses of: never; rarely; normally; frequently; and always, for probability of occurrence and responses of: none; weak; normally; strong; and very strong, for power to produce a claim.

Part Three

Respondents are asked to arrange causes of claims according to their importance from their points of view, and sought feedback on how to avoid such causes.

Part Four

Respondents are asked to explain a case of a claim that the respondent would like to share or review.

Pilot Survey

Before distributing the questionnaire, a pilot survey was conducted where the questionnaire was discussed with experts. Four experts reviewed the questionnaire for clarity, ambiguity and practicality. Experts' feedback was that participants may face some difficulty when filling this questionnaire. Also the researcher would face difficulty in finding participants capable of filling out this questionnaire. It was decided among the research team to conduct the survey through personal administration of the questionnaire, in order to overcome the aforementioned problems, which actually proved to be effective in overcoming them.

Sampling Approach

The questionnaire was distributed to a non-random sample of 300 participants representing the different specializations of contractors, consultants and owners working in different positions (head office and site). The choice of participants was achieved through the "Snow Balling" sampling technique. The questionnaire was personally handed over to

respondents, and the interviewer was available to answer questions about questionnaire and to ensure that the questionnaire is rightly administered. This mode of follow up communication led to the completion of 63 questionnaires, and a 20% response rate (10 owners, 15 consultants, and 38 contractors). The rate of response was due to the difficulties faced in gathering responses. The sample constituted of 60% contractors, 25% consultants and 15% owners. The sample could also be classified by 65% public companies and 35% private companies.

The scope of the research included different size public and private companies. The task of finding the appropriate person to fill the questionnaire was difficult, as different titles / positions handle claims in companies. For a head office of the organizations, firstly, the contracts department manager or claims department manager was sought. If that was inexistent the technical office manager or the engineer that transacts with that subject was sought. For sites the project manager was sought, and if it was difficult to meet, the technical office engineer was sought.

In order to calculate the standard error in the responses of the questionnaire according to Easterby-Smith et al. (2002):

Sample size = 2500/E2

If the sample size is 63, then

63 = 2500/E2

E2 = 39.68

Standard Error (E) = 6.29 %

Although the value of the standard error is above 0.05, it can yet be considered acceptable as it is still below 0.10.

Results and Data Analysis

To determine the ranking of different causes according to importance from the point of view of contractors, consultants and owners, the researchers used the following equation:

Importance index for cause of claim = Severity index of probability of occurrence * Severity index of power of this cause to produce claim.

In order the calculate the severity index, first, the data collected from the survey was distributed in tables to obtain frequencies for every response for every cause, in the probability of occurrence and the power of causes to produce claims. Secondly, the severity index is calculated, and finally the causes are ranked according to their importance indices. The formula for calculating the severity index is as follows (Dominowski 1980):

$$Severity\ Index = \left(\frac{\sum_{i=0}^{4} a_i * x_i}{5 * \sum_{i=0}^{4} x_i}\right) * 100\%$$

a_i = Constant expressing the weight given to i.

x_i = variable expressing the frequencies.

i = 0, 1,2,3,4

a_0 = 0, in case of a response of never for probability of occurrence, and never for power

a_1 = 1, in case of response of rarely for probability of occurrence, and weak for power

a_2 = 2, in case of response of normally for probability of occurrence, and normally for power

a_3 = 3, in case of response of frequently for probability of occurrence, and strong for power

a_4 = 4, in case of response of always for probability of occurrence, and very strong for power

The ranking of causes of claims according to the results of each project party is shown in Figure 1. It can be seen from the figure that the top cause of claims is "variations initiated by the employer / engineer". Other important causes in their rank order are: "unexpected changes in materials prices"; "unexpected bidding, underestimation and incompetence of contractors"; "contract documents having errors, defects, omissions, and poor management"; and "delays in payments to contractors and resulting cash problems during construction".

The least important reason causing claims was "restricted access". Other low important reasons were, in reverse ranking order: "increase of complexity and scale of building process"; "delay of owner representative / consultant in inspection of work"; "changed conditions"; and "faulty and / or late owner-supplied equipment and material". Intermediate ranking causes have been omitted in the figure for illustrative purposes.

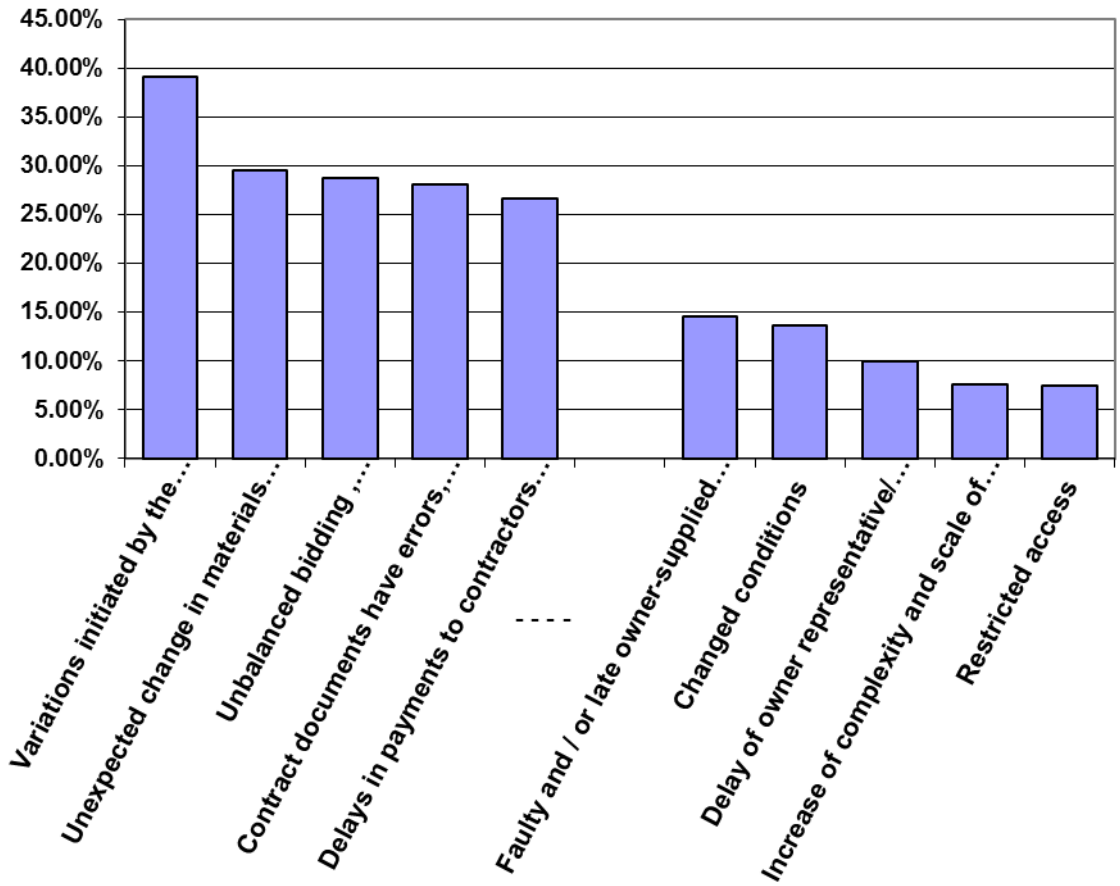

Figure 1. Highest and Lowest Overall Ranking Causes of Claims

Differences in Project Party's Responses

To quantitatively assess the differences among parties, the Spearman's correlation coefficient was applied to the ranking of contractors and consultants, contractor with owner and consultant with owner. By applying the equation between contractor and consultant, the correlation coefficient obtained was equal to 0.68736, which can be considered a medium to strong correlation. The correlation coefficient between contractor and owner was 0.7, which can be considered as a medium to strong correlation. The correlation coefficient between consultant and owner was equal to 0.79412, which can be considered as a strong correlation. The stronger correlation between the consultant and owner can be explained by consultant and owner being jointly responsible for some of the causes and the consultant working on behalf of the owner in projects. This can be seen in Table 2, where the responses of the consultant and owner being much closer to one another for the causes of "delays of approval of shop drawings, instructions and decision making", "delay of owner representative / consultant in inspection work", and "unbalanced bidding, underestimation and incompetence of contractors".

Table 2: Ranking of Causes according to their Importance from Contractor, Consultant and Owner

Rank	No.	Causes of claims	Ranking		
			contractor	consultant	owner
1	7	Variations initiated by the employer/engineer (additive/deductive)	1	1	1
2	17	Unexpected change in materials prices	3	6	2
3	10	Unbalanced bidding , underestimation and incompetence of contractors	9	2	4
4	3	Contract documents have errors, defects, omissions, and poor management	5	3	7
5	1	Delays in payments to contractors and resulting cash problems during construction	2	4	11
6	13	Relatively low profitability of the construction industry	10	5	3
7	16	Unexpected changes in exchange, interest, and inflation rate	7	8	6
8	2	Inferior quality of design, drawings and / or specifications	4	11	5
9	8	Acceleration and stop-and-go operations	8	9	8
10	6	Stakeholders involved in the project	11	7	9
11	4	Delays of approval of shop drawings, instructions and decision making	6	14	12
12	11	Insufficient time for bid preparation and inadequate investigation before bidding	14	10	13
13	5	Faulty and / or late owner-supplied equipment and material	12	12	14
14	14	Changed conditions	15	13	10
15	9	Delay of owner representative/ consultant in inspection of work	13	16	16
16	15	Increase of complexity and scale of building process	17	15	17
17	12	Restricted access	16	17	15

The most important cause of claims "variations initiated by the employer / engineer" received unanimous top ranking from all parties, which shows how important this cause is and the effect it might have in decreasing the number of claims in the industry. The opinions of all three parties were close for the four least ranked causes, such as in "insufficient time for bid preparation and inadequate investigation before bidding", "restricted access", "changed conditions", and "increased complexity and scale of building process".

The ranking of the cause "delays in payments to contractors and resulting cash problems during construction" in the owner's point of view (11th) is much lower than that of the contractor and consultant (2nd and 4th, respectively). This is probably due to the owner being responsible for such payments.

Avoiding Construction Claims

Part three of questionnaire asked the participants to give suggestions for how to avoid claims. As a result of these responses and of discussions within the personal administration of the survey, a number of suggestions have been compiled. In general, avoidance of claims needs real desire and complete coordination between parties. A policy of claims avoidance should be adopted by all concerned with the project. This policy should apply like quality assurance from the day the owner takes the decision to build until the final account is agreed. The compiled suggestions of participants to avoid causes of claims are as follows:

- Special consideration should be given to an appropriate contract type with a well-balanced contract.
- Special consideration for contract clauses dealing with variations / extras, disputes, inspections, approvals, payments, and delays.
- Owner must allow reasonable time for design team to produce clear and complete drawings and specifications.
- Reasonable investigation is required from the owner in choosing consultants.
- Provision of a proper mechanism for processing and evaluating variations.
- Use of critical path scheduling, cost control, and productivity analysis to monitor progress and detect any changes in schedule, cost and productivity.
- Enforcing liquidated damage clauses and offering incentives for early completion.
- Developing human resources in the construction industry, through proper training. This calls for providing incentives such as offering a tax deduction on money spent on training. Also developing human resources applies to construction engineers who lack adequate managerial skills. There is an urgent need for offering training courses in scheduling, time and cost control, information systems, contracting, quantity survey and management of human resources.
- Contracts should mention the maximum or anticipated time for owner / consultant replies to contractor requests.

Conclusion and Recommendations

The number of construction claims has been increasing and has become a time-consuming and costly element in construction projects in Egyptian. There is no guarantee that claims can be avoided entirely. However, avoiding claims and disputes requires the understanding for causes of claims, and thus this research aimed to identify these causes and possible methods of avoiding claims.

A questionnaire survey was used to quantitatively evaluate the causes of claims from literature. The questionnaire was designed and reviewed for clarity, ambiguity and practicality. There was agreement among all parties on choosing "variations initiated by the employer/engineer (additive/deductive)" to be the most important cause of claims in Egypt. Other important causes in their rank order are: “unexpected changes in materials prices”; “unexpected bidding, underestimation and incompetence of contractors”; “contract documents having errors, defects, omissions, and poor management”; and “delays in payments to contractors and resulting cash problems during construction”. The least important reason causing claims was “restricted access”. Other low important reasons were, in reverse ranking order: “increase of complexity and scale of building process”; “delay of owner representative / consultant in inspection of work”; “changed conditions”; and “faulty and / or late owner-supplied equipment and material”.

A medium to strong correlation existed between the opinions of the contractor and owner and between the contractor and consultant, whereas, a strong correlation existed between the consultant and owner. This can be explained by the joint responsibility between the consultant and owner towards some of the causes or by the consultant working on behalf of the owner.

The recommendations to industry to avoid or at least reduce claims in Egyptian construction are:

- using well balanced contracts, in terms of the contractor / consultant / and owner rights and responsibilities, such as FIDIC contracts;
- giving special consideration to contract clauses especially those related to times of owner/consultant replies, approvals, variations, inspections and payments;
- owner to choose appropriate tendering and awarding methods, as well as appropriate contract types;
- good choice of experienced consultants, especially in construction management;
- owner to allow reasonable time for design team to produce clear and complete drawings and specifications;
- provision of a proper mechanism for processing and evaluating variations and claims in the contract;
- use of proper project management and control techniques;
- enforcement of liquidated damage clauses and offering incentives for early completion;
- presence of a maximum or anticipated time for owner / consultant to reply to contractor request; and
- all parties to develop their human resources capabilities, especially in the areas of construction and general management skills.

It should be noted that many of these recommendations apply to activities happening in the procurement phase and so, more care should be given to this phase of the project. In

general, it can be said that the owner's choice of contract, procurement strategy, consultants, and contractor sets the tone for claims. Furthermore, a policy of claims avoidance should be adopted by all parties concerned and should be applied in a manner similar to quality assurance from the day the owner takes the decision to build until the final account is agreed.

This research opens the door to possible future research. Examples are investigating the causes of change / variation orders, investigating the causes of claims in other Arabic, African, Asian and developing countries, comparing the causes in different countries in light of their surrounding environment. Furthermore, the processes and procedure used in international contracts, such as FIDIC contracts can be investigated as to their application in Egypt, and the effect this might have on claims. Finally, each of the claim causes and suggestions for reducing claims can be researched so as to quantify their effect.

References

Abd El-Razek, M. E., Bassioni, H. A. and Abd El-Salam, W. A., 2007. Investigation into the cuases of claims in Egyptian Building Construction. *Proceedings of the 23rd Annual Conference of the Association of Researchers in Construction – ARCOM*, September 3rd – 5th, University of Ulster, Belfast.

Al-Moumani HA., 2000. Construction delay: a quantitative analysis. *International Journal of project Management*, 18, 51-9

Awad, A., 2005. *Measuring the Efficiency of Construction Claim Administration in Construction Companies in Egypt*. Master Thesis, Faculty of Engineering, Zagazig University.

Basha, I. M., Askar, M. M., Amer, M. I., and Saleb, A. L., 2007. Measuring the efficiency of construction claim administration in construction companies in Egypt. *Housing and Building Research Center – HBRC – Journal*, 3 (1), 72 – 82.

Diekmann, J. E. and Giraed, M. J., 2001. Are Contract Disputes Predictable. *Journal of Construction Engineering and Management*, 121 (4), 355-363.

Dominowski, R., 1980. *Research Methods*. Prentice Hall, Englewood Cliffs, New Jersey, USA.

Easterby-Smith, M., Thorpe, R. and Lowe, A., 2002. *Management Research: An Introduction.* Sage Publications, London, UK.

Hassanein, A. A. G., and El Nemr, W., 2008. Claims management in the Egyptian industrial construction sector: A contractor's perspective. *Engineering, Construction, and Architectural Management,* 15(3), 246-259.

Ip, S. S., 2002. An overview of construction claims: How they arise and how to avoid them. *Loreman Seminar for Construction Contracting for Public Entities in British Columbia*, Canada, October 31, 2002.

Jergeas, G. F. and Hartman, F. T., 1994. Contactors' Construction-Claims Avoidance. *Journal of Construction Engineering and Management*, 120 (3), 553-561

Kumaraswamy, M. M. and Yogeswaran, K., 1998. Significant sources of construction claims. *International Construction Law Review*, 15 (1), 144-160

Marzouk, M., El-Mesteckawi, L. and El-Said, M., 2011. Dispute resolution aided tool for construction projects in Egypt. *Journal of Civil Engineering and Management*, 17 (1), 63-71.

McMullan, j., 2003. *Trends in construction contract disputes*. Electronic Construction Law J., [online] http:/www.mcmullan.net/eclj/frmain.htm.

Mohamed, K. A., Khoury, S. S., and Hafez, S. M.,, 2011. Contractor's decision for bid profit reduction within opportunistic bidding behavior of claims recovery. *International Journal of Project Management*, 29 (1), 93-107.

Revay, S.G., 1990. "Claim Seminar." Special seminar prepared for Macmillan Bloedel Limited, Revay and Associates Ltd., Vancouver, british Columbia.

Semple, C. et al., 1994. Construction Claims and Disputes: Causes and Cost/Time Overruns. *Journal of Construction Engineering and Management*, 120 (4), 785-795