Factors Influencing Claims Management practices in the Nigerian Construction Industry

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Abstract

The management of construction claims is a vexing problem for stakeholders in the construction industry. Despite research efforts, there remains no agreement over how much should be paid to the contractor when a claim is established. The problem is further complicated by the client's desire to complete the project at the minimum possible cost while the contractor intends to maximise profit at the project's conclusion. There is, however, a consensus that the best approach to managing construction claims involves adopting claims management processes. The purpose of this study is to identify and categorise positive and negative factors. A survey approach was used in gathering information and 197 valid responses were collected through structured questionnaires administered to industry practitioners. Data collected were analysed using mean item score and factor analysis. The result shows that 42 factors with a mean score above 2.00 contribute positively while 2 factors with a mean score of less than 2.00 contribute negatively to construction claims management. The result of factor analysis identifies six groups of positive factors influencing which are the drivers that contribute meaningfully to successful construction claims management. These groups were planning control and organisation factors; quality and schedule factors; procurement and environmental factors; contractor's motivational factors, contractor's management capabilities factors; and cost and time management factors. It also identifies four groups of negative factors that must be mitigated before claims could be settled amicably, namely: societal; contractor's liability; lowest bid; and people. It implies that the identification and application of these positive factors influencing construction claims will strengthen the relationship between clients and contractors and subsequently improve construction claims management. The study recommends that the negative factor should be mitigated to achieve robust construction claims management practices.

Keywords: Construction claims management; Construction project success; Dispute management; factors; Risk management.

INTRODUCTION

Several studies have confirmed that construction claims management is an integral part of project management, notable among such studies are Bramble and Callahan (2011) which concluded that claims are an integral part of almost all civil and building contracts. Yates and Epstein (2006), and Banwo (2016) also asserted that claims have become an integral part of the building process. Tochaiwat and Chovichien (2004) described construction claims management as the process of dealing with or controlling "the seeking of consideration or change by one of the parties involved in the construction process". Kululanga, Kuotcha, McCatter & Edum-Fotwe (2001) concluded that, although the construction business has moved toward partnering arrangements in recent years, the number of claims management difficulties continue to rise. Diverse approaches have been proposed to ensure effective construction

claims management in the industry. Khekale & Futane (2015) proposed step-by-step administration of construction claims based on a claims management process. Mohamed, Khoury, & Hafez (2011) and Ho & Liu (2004) proposed an analytical model for managing claims while Fidan, Dikmen & Birgonul (2010) suggested that construction claims should be managed through multi-agent negotiation. These studies focus primarily on approaches to construction claims management without considering factors influencing the management of the claims. Also, several research studies have been conducted to assess either success factors or factors influencing construction project performance such as (Cha and Kim, 2011; Enshassi, Mohamed & Abushaban 2009; Eriksson & Vennstrom, 2009; Saraf (2013); Chan, Scott, & Chan (2004); Eriksson & Westerberg, 2010; Ogunsanmi, 2013; and Soewin & Chinda 2017). The above studies provide insight into factors influencing performance at the project level while studies that focus on factors influencing construction claims management as a knowledge area still lack. This paper, therefore, aims at assessing factors influencing construction claims management practices.

Table 1: Positive Factors influencing Construction Claims Management

S/N	Factor	Sources	Code
1	Stakeholder's ability to manage conflicts, political, economic, social; legal, and environmental influences on the project.	Takim & Akintoye, (2002); Soewin & Chinda (2017); Chan *et al.*, (2004)	SD1
2	Adherent to budget	Blindenbach, (2006); Aje, (2012); Ajibade, (2006)	SD2
3	Meeting aesthetic value and appearance of the project by the construction team	Takim & Adnan, (2008); Ogunsanmi, (2013)	SD3
4	Limited bid invitation by the stakeholders which encourage long term relationship Incentives for the workforce by the contractor to increase productivity	Eriksson & Vennstrom, (2012); Eriksson & Westerberg, (2010)	SD5 SD6
5	Adequate control of the size and complexity of the project through design	Stansbury, (2005); Chan *et al*, (2004); Saraf (2013)	SD7
6	Reduction in site risk factors by the construction team	Ogunsanmi, (2013)	SD8
7	Degree of innovative technology and awareness or "best practice" that can improve the construction process by the stakeholders	Ogunsanmi, (2013); Fincham & Clark, (2002); Saraf (2013)	SD9
8	The ability of the contractor to make a profit which will enhance his productivity	Al-Tmeemy *et al.*, (2011); Roper & McLin, (2005); Saraf (2013)	SD10
9	Effective communication and reporting of activities by the consultants	Takim & Akintoye, (2002); Soewin & Chinda (2017);	SD11
10	Compliance with safety requirements by the construction team	Ogunsanmi, (2013); Wai, *et al.*, (2012)	SD12
11	Effective planning, reasonable design, and construction time under a procurement method	Ogunsanmi, (2013); Soewin & Chinda (2017); Chan *et al.*, (2004)	SD13
12	Early start, speedy construction, and early occupation of a project using a particular procurement method	Ogunsanmi, (2013); Takim & Adnan, (2008); Chan *et al.*, (2004)	SD14
13	Elimination of time and cost overruns, minimum capital and maintenance cost in using the procurement method	Ogunsami, (2013); Chan *et al.*, (2004)	SD15
14	Transparency and accountability in the use of a procurement method by the stakeholders	Takim & Akintoye, (2002); Public Procurement Act, (2007)	SD16

15	Consideration of equipment base and previous contractor business records under a procurement method to ensure quality work.	Public Procurement Act, (2007); Chan *et al.*, (2004); Saraf (2013)	SD17
16	The use of open invitation in public projects, which hampers long-term relationships	Eriksson & Westerberg, (2010)	SD18
17	Absent of claims from the client due to compliance with contract terms	Al-Tmeemy *et al.*, (2011); Soewin & Chinda (2017)	SD19
18	Committed fund by the contractor to ensure early completion	Roper & McLin, (2005); Chan *et al.*, (2004)	SD20
19	The degree to which the contractor is environmental friendly in the choice, use, and processing of materials	Tam *et al.*, (2006b); Chan *et al.*, (2004)	SD21
20	The implementation and amount included as liquidated/ascertained damages in a contract	Lynch (2003); Soewin & Chinda (2017)	SD22
21	A fixed payment schedule that increases the risk opportunism, conflicts and hampers cooperation	Kadefors (2005); Soewin & Chinda (2017)	SD23
22	A reimbursable payment schedule that facilitates contractor performance	Tang, *et al.*, (2006); Eriksson (2009); Dulaimi, *et al.*, (2003),	SD24

Many research studies have been carried out to evaluate factors influencing project performance in the construction industry. Enshassi *et al*., (2009) identified 63 factors and grouped them into cost, time, quality, productivity, client satisfaction, regular and community satisfaction, people, health and safety, innovation and learning, and environmental factors. Chan *et al.*, (2004) identified 44 factors and grouped them under five main categories namely project-related, procurement-related, project-management, project participants-related and external factors. Saraf (2013) identified 20 factors influencing project performance and concluded that the most important factors are improper planning, improper design, and site management. Soewin & Chinda (2017) assessed 64 factors and hypothesized it into nine groups which include time, cost, quality, safety and health, client satisfaction, environment, financial performance, people, and information, technology & innovation. Several factors influencing project performance was identified by various authors but in this study 44 factors influencing construction claims management were classified into positive and negative based on the researcher's experience as shown in Tables 1 and 2 respectively.

Table 2 Negative Factors Influencing Construction Claims Management

S/N	Factor	Sources	Code
1	Inclusion "kickback" in tender	Alutu, (2007)	SD25
2	Ignoring of excessive prices by officials due to vested interests	Alutu, (2007); Chan *et al.*, (2004)	SD26
3	Allowing multiple subcontracting of a project for financial benefit	Alutu, (2007)	SD27
4	Assurance of winning bids given to contractors in advance of the bidding process	Alutu, (2007); Soewin & Chinda (2017)	SD28
5	Vital information leaked to the contractor paying bribes	Alutu, (2007)	SD29
6	Bidders colluding together to share the market where the contractor tender a cover price to ensure the pre-selected contractor win the tender	Oyewobi *et al.*, (2011)	SD30
7	Distortion of pre-qualification by consultants where the contractor who bribed the consultant wins the project	Oyewobi *et al.*, (2011)	SD31

8	None disclosure of the financial status of the project by the client with the hope that the contractor may not commence the work if he is aware of his financial difficulties	Oyewobi *et al.,* (2011)	SD32
9	The tender process may be corrupted by internal pressure due to certain companies owned by either consultant or client or his family or government	Oyewobi *et al.,* (2011)	SD33
10	A favoured contractor may add a certain percentage to the contract sum for the official	Oyewobi *et al.,* (2011)	SD34
11	The client may connive with the architect to delay issuance of the certificate thereby resulting in delayed payment.	Oyewobi *et al.,* (2011)	SD35
12	Sharing of money between consultant and contractor through collusion to issue a certificate for a contractor when they use inferior/substandard or non-executed works	Oyewobi *et al.,* (2011)	SD36
13	Increasing the contractor's claim with an agreement to share the additional money.	Oyewobi *et al.,* (2011)	SD37
14	Adequate control of the size and complexity of the project through design	Stansbury, (2005); Saraf (2013)	SD38
15	Pre-qualification cost involved in the use of the procurement method	Ogunsami, (2013); Chan *et al.,* (2004)	SD39
16	Increase the risk of cost, opportunism, conflicts, and schedule growth due to several change orders based on the high weight on the lowest bid price	Assaf & Al-Hejji (2006); Wardani *et al.,* (2006)	SD40
17	Absent of claims from the client due to compliance with contract terms	Al-Tmeemy *et al.,* (2011); Soewin & Chinda (2017)	SD41
18	Unapproved change order for the contractor which result in financial loss	Roper & McLin, (2005)	SD42
19	Backlog (a job at hand for the contractor that may delay early completion	Roper & McLin, (2005); Soewin & Chinda (2017)	SD43
20	The implementation and amount included as liquidated and ascertained damages in a contract	Lynch (2003); Soewin & Chinda (2017)	SD44

MATERIALS AND METHOD

The study was based on a questionnaire survey distributed to 323 respondents (i.e. clients, contractors, architects, and consultants) that were engaged in construction projects executed between 2009 and 2016 by the Ondo State Government, Nigeria. The survey method was selected because practitioners are in the best position to provide information on the subject matter. The questionnaire was divided into two parts. Part I elicited respondents' personal background information while part II focused on obtaining ideas on the factors influencing the management of construction claims (the respondents were asked to rate the factors influencing construction claims management as either positive or negative on a four-point Likert type scale with 4 being very positive and 1 being very negative). The decision rule was that factors with a mean score of less than 2 were regarded as negative. Data collected were analysed using mean item score and factor analysis of multivariate relationships that exist among the factors. Factor analysis is important in the study because it captures factors that contribute to the effective management of construction claims positively or negatively. A total of 197 valid questionnaires were returned, giving a response rate of approximately 61%. The small sample size (44) used in the factor analysis was based on the existence of high commonalities, as proposed by Barrett and Kline (1981) and Arrindell and Ende (1985). Cliff and Pennell (1967) experimentally confirmed that improvement in factor analysis was due to communality size rather than loading size per se. MacCallum *et al.* (1999) also verified this argument. The quality

and output of acceptable factor analysis are determined by the initial data screening (Abdulwahab *et al.*, 2011). In the study, multiple instructions were inserted into the survey to identify individuals who manifested sporadic lapses in attention. Principal component analysis (PCA) was used to reduce the data and assess the strength of the relationships among variables, rather than factor analysis, to reveal any latent variables that cause the manifest variables to converge (Costello and Osborne, 2005).

RESULTS AND DISCUSSION

Results

Demographic Profile of Respondents

The result shows that 71% of the respondents had more than 16 years of experience in their current company. This implies that the respondents' length of service is sufficient enough to have a good understanding of the construction management practices of their workplace, enabling them to give reliable answers to the questions. A total of 43.2% of the respondents had obtained Master's Degrees, while 28.9% and 20.8% had obtained Bachelor's Degrees and Higher and Higher National Diplomas in their various fields of study, respectively. The majority of respondents were quantity surveyors (42.6%), followed by the architects (35%), while builders had the lowest representation (10.7%).

Furthermore, 53.3% of the respondents were corporate and registered members of their respective professional bodies, with 19.8% and 8.7% being Probational and Fellow Members of their respective professional bodies, respectively. This suggests that they are well educated, professionally qualified, and competent to answer the questions as their opinions can be considered reliable.

Factors Influencing Construction Claims Management Practices

The respondents' perception of the factors influencing construction claims management is as indicated in Table 2. Clients opined that limited bid invitation by the stakeholders, which encourages long-term relationships, with a mean value of 3.49, was the most important factor influencing construction claims management practices. This was followed by the early start, speedy construction, and early occupation of a project using a particular procurement method, with a mean value of 3.36, whereas the least ranked factor was the inclusion of 'kickback' in tender, with a mean value of 1.22. Generally, the clients' perceptions indicated that 32 factors influencing construction claims management contributed positively, while 12 factors contributed negatively. The contractors ranked effective planning, reasonable design, and construction time under a procurement method, scored a mean value of 3.32, as the most important factor influencing construction claims management practices. In the opinion of the contractors, 42 factors contributed to construction claims management positively, while 2 factors contributed negatively.

The consultants considered that transparency and accountability in the use of a procurement method by the stakeholders scored a mean value of 3.75 as the most important factor influencing construction claims management practices. Both contractors and consultants agreed that the least important factor was increasing the contractor's claim with an agreement to share the additional money scored mean values of 1.27 and 1.32, respectively. Generally, the consultants rated 34 factors as contributing positively and 10 factors as contributing negatively.

The overall opinion of the respondents revealed that adequate control of the size and complexity of the project through design scored a mean value of 3.62, was the most important factor, while increasing contractor's claim with an agreement to share the additional money, scored a mean value of 1.29, was the least important factor. The results of the overall descriptive statistical analysis as shown in Table 2 indicate that 42 out of 44 factors had mean score values ranging from 2.02 to 3.47, which were above average. Thus, this implies that the 42 factors have a positive impact on construction claims management practices.

Table 3 also shows that only two factors had mean values less than 2.00. That is 1.29 and 1.35 respectively. This implies that some of the factors that are supposed to contribute negatively to construction claims management were rated positively by the respondents. This might not be unconnected with the prevalence of fraudulent practices in Nigeria. For example, ignoring excessive prices by officials due to vested interests was rated positively in the overall assessment by the respondents.

Also, comparing the opinions among the three groups of respondents, the opinion of the clients appears to be the most realistic because factors rated as negative can be quantified as reasonable. This may be because financial clients feel the pains of corrupt practices that are constantly prevalent in the construction industry in Nigeria.

A further analysis was carried out to test the agreement on the opinions of the respondents using the Kruskal–Wallis K-test, which resulted in an asymptotic significance value of 0.000, which is less than 0.01. This denotes that there is a significant difference in the opinion of the groups of respondents as regards this aspect of the study.

Factor Analysis

Factor analysis was used to confirm the results of the mean item score method of analysis for factors influencing construction claims management practices. The factor reduction technique was also employed to reduce a large number of variables to principal factors based on their relationships using PCA. From the factor analysis, the 44 items were not satisfactory for extraction requirements because the result of the first Varimax rotation showed that six of the factors had a measure of sampling adequacy (MSA) less than the acceptable 0.500, while the remaining 38 factors had MSAs in the range of 0.511 to 0.825 (greater than the required 0.500). These six complex factors with MSAs less than 0.500 were eliminated. To achieve a simple structure, Varimax rotation was repeated to eliminate additional complex variables, resulting in a further four complex factors with MSAs less than 0.500 being eliminated. The Varimax rotation was repeated with the remaining 34 factors several times without any change in the total variance explained.

The results revealed that 34 items were satisfactory for extraction requirements and the Kaiser–Meyer–Oiken (KMO) = 0.797, (approximate $\chi^2 = 4213.330$, $p = 0.000$). From the 34 factors, 10 principal components were extracted with MSAs ranging from 0.504 to 0.826. The purpose of PCA in this study is to explore relatively small positive and negative factors that can be used to represent the relationship among the 44 factors identified in the literature. The negative factors represent those to watch for, and mitigate, in construction claims management practices, whereas the positive factors are those that are needed for successful construction claims management practices. Table 4, shows that the total variance explained by the first component was 25.690%, while the tenth component explained a total of 2.772%. The total variance explained by other components is as shown in Table 4. Almost 69.122% of the total variance was attributed to the 10 components extracted with eigenvalues greater than 1.

Table 3. Factors Influencing construction claims management practices

	Client		Contractor		Consultant		Overall	
Factors	MS	Rank	MS	Rank	MS	Rank	MS	Rank
SD38	3.31	5	2.94	10	3.62	5	3.62	1
SD13	3.29	7	3.32	1	3.68	4	3.47	2
SD16	3.22	16	3.10	4	3.75	1	3.41	3
SD14	3.36	2	3.06	8	3.62	5	3.37	4
SD12	3.33	3	3.32	1	3.72	2	3.31	5
SD11	3.13	21	2.88	15	3.70	3	3.29	6
SD17	3.27	9	2.97	9	3.52	7	3.27	7
SD15	3.31	5	3.18	2	3.27	17	3.25	8
SD7	3.22	16	3.09	6	3.39	13	3.25	8
SD5	3.27	9	3.12	3	3.30	16	3.23	10
SD6	3.49	1	3.07	7	3.20	23	3.22	11
SD4	3.27	9	2.91	12	3.42	11	3.21	12
SD9	3.29	7	2.84	18	3.45	10	3.20	13
SD24	2.98	26	2.91	12	3.52	7	3.19	14
SD44	3.27	9	2.74	23	3.51	9	3.19	14
SD10	3.33	3	2.93	11	3.27	17	3.17	16
SD2	3.11	23	2.84	18	3.41	12	3.14	17
SD19	2.93	27	3.10	4	3.27	17	3.14	17
SD3	3.20	19	2.91	12	3.18	25	3.09	19
SD21	3.27	9	2.65	26	3.31	15	3.07	20
SD8	3.20	19	2.60	30	3.36	14	3.06	21
SD1	2.84	28	2.88	15	3.18	25	3.00	22
SD40	3.22	16	2.85	17	2.99	29	2.99	23
SD39	3.24	14	2.50	36	3.23	20	2.98	24
SD41	2.76	30	2.77	22	3.23	20	2.96	25
SD18	3.13	21	2.62	29	3.13	27	2.95	26
SD20	3.00	25	2.59	32	3.19	24	2.94	27
SD22	2.82	29	2.66	25	3.23	20	2.94	27
SD42	3.07	24	2.81	20	2.79	30	2.86	29
SD23	2.62	31	2.35	41	3.03	28	2.71	30
SD43	3.24	14	2.27	42	2.39	31	2.54	31
SD34	1.98	33	2.71	24	2.01	34	2.24	32
SD27	1.78	38	2.63	28	2.02	33	2.18	33
SD33	2.09	32	2.53	34	1.93	36	2.17	34
SD32	1.89	36	2.41	39	2.12	32	2.17	34
SD36	1.98	33	2,54	33	1.88	37	2.13	36
SD28	1.87	37	2.53	34	1.87	39	2.10	37
SD29	1.73	39	2.60	30	1.83	41	2.08	38
SD35	1.96	35	2.38	40	1.87	39	2.07	39
SD37	1.29	43	1.27	43	1.32	44	1.29	44

Grouping of the Factors Influencing Construction Claims Management Practices

The extracted items from the 34 factors were grouped into 10 PCs, as indicated in Table 5.

Component 1: Societal Factors

This principal factor accounted for 25.690% of the observed total variance and contained 11 items with an eigenvalue of 9.762 as shown in Table 4. The highest loading item was bidders colluding together to share the market where the contractor tenders a cover price to ensure that

pre-selected contractor wins the tender, with an MSA value of 0.819, while the lowest loading item was allowing multiple subcontracting of a project for financial benefit, with MSA value of 0.566 as indicated in Table 5. This component contains negative factors that should be avoided or mitigated before successful construction claims management practices can be achieved. Soewin & Chinda (2017) referred to this component as an internal stakeholder factor and suggested that the construction team have the responsibility to formulate strategies to govern their relationship during the project execution to be able to manage the project successfully. Chan *et al.*, (2004) classified this component as project participant-related factors and suggested that construction project management requires team spirit for successful management of cost.

Table 4. Total variance extracted.

	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings	
Component	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance
1	9.762	25.690	25.690	9.762	25.690	25.690	6.340	16.685
2	4.315	11.354	37.044	4.315	11.354	37.044	3.779	9.946
3	2.539	6.681	43.726	2.539	6.681	43.726	2.747	7.228
4	1.928	5.074	48.800	1.928	5.074	48.800	2.714	7.142
5	1.495	3.933	52.733	1.495	3.933	52.733	2.237	5.886
6	1.389	3.656	56.389	1.389	3.656	56.389	1.911	5.029
7	1.385	3.645	60.034	1.385	3.645	60.034	1.785	4.696
8	1.237	3.256	63.289	1.237	3.256	63.289	1.707	4.491
9	1.163	3.060	66.350	1.163	3.060	66.350	1.566	4.121
10	1.053	2.772	69.122	1.053	2.772	69.122	1.481	3.897

Component 2: Planning Control and Organisational Factors

This principal factor accounted for 11.354% of the observed total variance and contained 4 items with an eigenvalue of 4.315 as indicated in Table 4. The highest loading item was an early start, speedy construction, and early occupation of a project using a particular procurement method with an MSA value of 0.780, whereas the lowest loading item was effective communication and reporting of activities by the consultants with an MSA value of 0.7 as shown in Table 5. These are positive factors that concern planning control in the early stages of the project. These components contain administrative strategies that will assist stakeholders in achieving robust construction claims practices at the execution stage of the project. Chan *et al.*, (2004) referred to this component as management factors that would enable managers to plan, execute, and maximize project chance of success.

Component 3: Quality and Schedule Factors

This principal factor accounted for 6.681% of the observed total variance and contained 4 items with an eigenvalue of 2.539 as indicated in Table 4. The highest loading item was adherence to quality standards, technical specifications, and functional requirements by the construction team with an MSA value of 0.780, while the lowest loading item was limited bid invitation by the stakeholders, which encourages long-term relationships with an MSA value of 0.558 as

shown in Table 5. These are positive factors that are required for the attainment of high-quality products and completion at the scheduled time; they are required for the attainment of productive construction claims management practices. According to Cheung *et al.* (2004), quality factors help to ensure that projects achieve the quality standard set out in the contract. These include quality control, reporting on the number of non-compliance issues, works rejection rates, and sample rejection rates. Cheung *et al.,* (2004) also observed that time factors assessed the adherence to the planned schedule over some time.

Component 4: Procurement and Environmental Factors

This principal factor accounted for 5.074% of the observed total variance and contained 4 items with an eigenvalue of 1.928 as shown in Table 4. The highest loading factor was the use of open invitation in public projects, which encourages long-term relationships, with an MSA value of 0.777, while the lowest loading indicator was the degree of innovative technology and awareness of 'best practice' that can improve the construction process understood by the stakeholders, with an MSA value of 0.504 as indicated in Table 5. These are positive factors that are required for successful procurement and environmental management by the team to ensure there is no additional construction claim from the third party. Cheung *et al.* (2004) stated that environmental factors are intended to monitor nuisances such as air pollution, noise pollution, water pollution, and waste management on construction sites.

Component 5: Contractor's Motivation Factors

This principal factor accounted for 3.933% of the observed total variance and contains 3 items and the eigenvalue is 1.495 as indicated in Table 4. The highest loading item was incentives for the workforce provided by the contractor to increase productivity, with an MSA value of 0.774, while the least loading item was the implementation and amount included as liquidated and ascertained damages in a contract, with an MSA value of 0.639 as shown in Table 5. These are positive factors that will motivate both the contractor and the workforce, thus reducing the contractor's claims for idle time. This is in line with Soewin & Chinda (2017) that classified this as financial factors that focus on revenue for the construction company and most important for the survival of a company.

Component 6: Contractors' Liability Factors

This principal factor accounted for 3.656% of the observed total variance and contains 2 items with an eigenvalue of 1.389 as indicated in Table 4. Backlogged (a job at hand for the contractor that may delay early completion with MSA value of 0.770 and unapproved change orders for the contractor, which may result in financial loss with MSA values of 0.812 were the two factors in this component as shown in Table 5. These are negative factors that should be avoided or mitigated before successful claims management practices can be attained.

Component 7: Stakeholders' Management Capability Factors

This principal factor accounted for 3.645% of the observed total variance and contains 2 items with an eigenvalue of 1.385 as shown in Table 4. These were stakeholders' ability to manage political, economic, social legal, and environmental influences on the project and adherence to budget with MSA values of 0.826 and 0.648, respectively as indicated in Table 5. These are positive factors that can be used to measure the contractor's management capabilities to achieve effective construction claims management practices. Chan *et al,*. (2004) grouped this component as external environment factors and described it as external influences on the construction process. Soewin & Chinda (2017) also observed that external environmental issues in construction are global concerns that are an integral part of the construction.

Component 8: Cost and Time Management Factors

This principal factor accounted for 3.256% of the observed total variance and contains 2 items with an eigenvalue of 1.237 as shown in Table 4. These were committed funds by a contractor to ensure early completion and elimination of time and cost overruns, minimum capital, and maintenance, resulting from the use of a particular procurement method with MSA values of 0.770 and 0.512, respectively as indicated in Table 5. These are positive factors that can assist stakeholders in managing both costs and time scheduled for the project, thereby reducing or eliminating construction claims. Cheung *et al.* (2004) concluded that cost factors cover four areas: interim payment; control of variation order; control of prolongation claims; and final account forecasts that are important in managing construction claims.

Component 9: Lowest Bid Factors

This principal factor accounted for 3.060% of the observed total variance and contained 1 one item with an eigenvalue of 1.163) as shown in Table 4. The factor was increased risk of cost, opportunism, conflicts, and schedule growth due to several change orders based on the high weight on lowest bid price with an MSA value of 0.822 as indicated in Table 5. This is a negative factor and a common practice in the Nigerian construction industry. It is one of the major causes of construction claims in Nigeria. Therefore, it should be avoided or mitigated to implement successful construction claims management practices.

Component 10: Human Factor

This principal factor accounted for 2.772% of the observed total variance and it contained 1 item with an eigenvalue of 1.053 as shown in Table 4. The only factor in this component was the inclusion of 'kickback' in a tender with an MSA value of 0.779 as indicated in Table 5. It is one of the unethical (negative) practices in the Nigerian construction industry that should be avoided or mitigated if effective construction claims management practices are to be achieved. The human factor is an overview of how people 'feel' about the project performance concerning other variables such as time, cost, quality, etc. (Cheung *et al.*, 2004). In this study, human factors are the behaviours or attitudes of the stakeholders that were detrimental to successful construction claims management.

Table 5. Summary of Grouping of Factors Influencing Construction Claims Management Practices

Component	Group	S/N	Factor	MSA Value
1	Societal factors	1	SD26	.599
		2	SD27	.566
		3	SD28	.757
		4	SD29	.813
		5	SD30	.819
		6	SD31	.819
		7	SD32	.692
		8	SD33	.735
		9	SD34	.745
		10	SD35	.670
		11	SD36	.735
2	Planning control and organization factors	1	SD11	.717
		2	SD12	.738
		3	SD13	.753
		4	SD14	.780
3	Quality and schedule factors	1	SD3	.674

Component	Group	S/N	Factor	MSA Value
		2	SD4	.641
		3	SD5	.780
		4	SD6	.558
4	Procurement and environmental factors	1	SD9	.504
		2	SD7	.736
		3	SD18	.777
		4	SD20	.547
5	Contractors' motivation factors	1	SD21	.551
		2	SD22	.639
		3	SD23	.652
6	Contractors' liability factors	1	SD42	.790
		2	SD43	.812
7	Stakeholders' management capabilities factors	1	SD1	.826
		2	SD2	.648
8	Cost and time management factors	1	SD15	.512
		2	SD19	.770
9	Lowest Bid factor	1	SD40	.822
10	Human factor	1	SD25	.779

Discussion

Factors Influencing Construction Claims Management Practices

Considering the factors influencing construction claims management practices, the respondents rated 42 factors as contributing positive two factors contribute negatively to successful construction claims management practices. The results also showed differences in opinion among the three groups of respondents regarding some of the identified factors. However, the result of exploratory factor analysis shows that 19 factors contribute positively to construction claims management practices and these factors were grouped into 6 components namely: planning control and organisation; procurement and environmental; quality and schedule; contractors' motivation; stakeholders' management capabilities; and time and cost. The factors that contribute positively to construction claims management are the drivers of construction claims management practices. Kenton (2018) described the driver as a factor that has a material effect on the activity of another entity. The results also indicated that 15 items contribute negatively to construction claims management practices and they were grouped into 4 components namely: societal, contractors' liability, lowest bid; and human factors. Dictionary.com (2020) described a factor as one of the elements, circumstances, or influences which contribute to produce a result and negative as a word or statement that expresses denial, disagreement, or refusal. This implies that 'negative factors' will contribute to the management of construction claims negatively or detrimental to the attainment of successful construction claims management practices.

The individual group and overall ranking of some of the factors as positively impacting on construction claims management practices are surprising. This is due to the fact these factors

are detrimental to the attainment of successful construction claims management. Amongst such factors were a favoured contractor may add a certain percentage to the contract sum for the official; allowing multiple subcontracting of a project for financial benefit; the tender process may be corrupted by internal pressure due to certain companies being owned by either the consultant, the client, his/her family, or the government; sharing of money between consultant and contractor through collusion to issue certificates for the contractor when they have used inferior and cheap materials, executed substandard work, or failure to execute the work, and assurance of winning bids given to contractors in advance of the bidding process. The ranking of the above factors as positive might not be unconnected with the corrupt practices in the Nigerian construction industry. This finding reinforced the finding of Transparency International (2020), which ranked Nigeria 146 out of 180 countries reviewed, by the Corruption Perception Index (CPI), with a score of only 26% for the year 2020.

CONCLUSION

Based on the perception of the respondents, 42 and 2 factors influencing construction claims management practices were positive and negative respectively. Also, there were differences in opinion among the three groups of respondents regarding some of the identified factors. The individual and group rating of some factors that positively impact construction claims management practices was surprising. This may be due to the corrupt environment in Nigeria in general. However, exploratory factor analysis of the 44 identified factors influencing construction claims management practices indicated that 19 were positive while 15 were negative. The 19 positive factors were grouped into 6 components namely: planning control and organisation, procurement and environmental, quality and schedule, contractors' motivation, contractors' management capabilities, and cost and time management, while 15 negative factors were grouped into 4 components specifically: societal, contractors' liability, lowest bid, and human. The implication is that successful construction claims management practices cannot be achieved in the Nigerian construction industry without taking cognizance of the positive factors and mitigation of the negative factors. Further study should be carried out regarding measures for mitigating the negative factors.

The study recommends that the exogenous problems associated with construction claims management processes (negative factors) should be avoided whenever possible, or mitigated if unavoidable, to ensure robust construction claims management practices. The respondents used for this study were limited to Ondo state, Nigeria. To make the results of this study more generalise at a national level, a similar study could be performed that includes all six geopolitical zones in Nigeria. A comparison of these results for Nigeria with those for other developing countries would also be beneficial in terms of discovering similarities that could lead to the development of strategies and measures for mitigating the negative factors.

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