

Causes of Payment Problems in the New Zealand Construction Industry

Thanuja Ramachandra¹ and James Olabode Bamidele Rotimi²

¹*Department of Building Economics, University of Moratuwa, Sri Lanka*

²*School of Engineering, Auckland University of Technology, New Zealand*

Abstract

Payment delays and losses persist in the construction industry and continue to be a key concern to industry practitioners. Therefore an exploration of the key causes of payment delays and losses is undertaken in this study with the ultimate objective of seeking mitigating solutions. The study adopted a survey approach using an online questionnaire, administered to practitioners from the New Zealand construction industry, comprising consultants, head contractors and subcontractors. The data obtained was analysed using inferential statistical techniques, including comparing means and factor analysis. Factor analysis enabled clustering of the inter-related causes of payment delays and losses in order to find reduced number of causes. Accordingly, the study found that payment problems mainly relate to contractual issues, financial strength of industry players, disputes, short-comings of payment processes and 'domino effects'. Among them, the financial strength of critical industry players was considered central to payment problems. The study concludes that any solution to these problems must address these primary causes, as a rational starting point. Thus procuring a feasible form of financial security at the outset of a project, and the pre-qualification of the financial status of critical project participants, were found to be significant in the mitigation of construction payment risks.

Keywords: Payment problems, causal factors, factor analysis, construction, New Zealand

Paper Type: Research article

Introduction

Payment problems in the construction industry are not a new phenomenon. Such problems have been widely acknowledged for more than four decades by previous research (Banwell, 1964; Latham, 1994; Wu, 2010; Ye and Rahman, 2010; Wu, Kumaraswamy and Soo, 2011). The problem seems generalised, with contractors and subcontractors not getting paid their due amounts on time. This may take the form of under-payment, late or delayed payment and non-payment all together. Non-payment or under-payment refers to situations where an expected payment was never received, and/or would be considered bad debt, written off, or lost partially/fully. Late or delayed payment on the other hand, is a situation where payment is not made to head contractors or subcontractors on time, in accordance with the timelines agreed between the parties to the contract.

There is little doubt that payment defaults have many effects on project participants as well as the industry, as funding is the core of any economic transaction. Late and non-payments have an immediate effect on cash flow which in turn drives contractors and eventually subcontractors to

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Corresponding author: Thanuja Ramachandra; Email - thanuja03@hotmail.com

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source additional funding by means of overdraft, trade credits or other means. It was reported in China that late and eventual non-payments along with lack of security caused substantial cash flow difficulties leading to risks of insolvency of construction parties (Wu, Kumaraswamy and Soo, 2008). A prudent contractor who anticipates a payment delay from client could incorporate a risk factor against late/non-payment when pricing. However this increases the cost of projects as contractors tend to inflate tender prices if a client has a reputation for late payment (Wong and Hui, 2006). Late and non-payments lead to disputes and subsequent suspension and termination of projects. Research has revealed issues of payment as one of the major causes for disputes in the construction industry (Yates, 2003; Chan and Suen, 2005). The valuation of variations and final accounts, and failure to comply with payment provisions, are the major subject matters for disputes in construction project adjudication proceedings (Sheridan, 2003). Similarly Odeh and Battaineh (2002) suggest that failure to source adequate finance and make payments for completed works on time is a cause for construction delays attributable to project owners.

Evidence suggests that late and non-payments damage the productivity of the industry at large, but with more dire consequence to construction parties down the supply chain. Kadir et al. (2005) are of the opinion that payment delays cause slippages to material delivery which in turn impacts on labour productivity in the construction industry. With a similar opinion, Durdyev and Mbachu (2011) explained that delayed payment poses significant internal constraints to onsite labour productivity on construction projects in New Zealand. The construction industry in New Zealand is noted for its low labour productivity rates, being the fourth lowest among Organisation for Economic Co-operation and Development (OECD) countries (Constructing Excellence in New Zealand, 2008).

Countries such as the UK, USA, Australia, Singapore and New Zealand have enacted payment specific legislation and sought other legislative solutions to payment default in construction projects. In New Zealand, the Construction Contracts Act (CCA) is a payment specific legislation, which was a major step taken towards mitigating payment default within its construction industry. The CCA desired to improve the cash flow situations of constructors (Degerholm, 2003). Brand and Uher (2008) suggested that the frequency of late payments reduced with the promulgation of the Building and Construction Industry Security of Payment Act (SOP) 1999 in New South Wales, Australia. Although payment specific legislation is referred to as the Security of Payment Act in many countries, Bayley (2007) claims that these do not provide security over payment, they merely reduce payment delays. The Acts fail to provide protection against payment losses usually experienced by lower tier construction parties (Ramachandra and Rotimi, 2010). For example, Fairfax News in New Zealand (2008) indicated that the collapse of a prominent commercial construction firm left the suppliers and subcontractors of the company unpaid, with NZ\$2.4 million owed to them. More recently a leading property and construction company in New Zealand went into liquidation owing NZ\$139.3 million to unsecured creditors which included subcontractors and suppliers (PricewaterhouseCoopers, 2014). Similarly Reilly (2008) reported that a development company in the UK had gone into liquidation, owing €3.8 million to its suppliers and contractors. These are only a few examples of absence of security to payment defaults.

It therefore seems essential that issues of payment default are dealt with in construction industries as a matter of significance. Identifying the causes of payment problems is a key step to mitigating the problem. Literature suggests that causes for payment problems could have many dimensions. Hughes, Hillebrant and Murdoch (1998) are of the opinion that traditionally the problems associated with payments were due to either the payer is not able to pay, not willing to pay or both. However, Wu, Kumaraswamy and Soo (2011) stressed that the causes are not generic and could vary across countries due to their peculiar characteristics, economic and

political set ups. This current study therefore analyses these causative factors with reference to the New Zealand construction environment, to devise ways of mitigating the problem.

Literature Review – Factors Causing Payment Problems

There are many factors associated with payment defaults in the construction industry. Hughes, Hillebrant and Murdoch (1998) explained that payment default is primarily due to two reasons: the ‘cannot’ and ‘would not’ pay attitude of payers. The ‘cannot pay’ situation refers to payers’ financial difficulties due to failure to seek funding or not having sufficient equity capital and improper cash flow management. The ‘would not’ pay situation lies with payers’ attitude. It seems common for clients to delay payment to construction contractors and subcontractors in order to manage their cash flow for other projects and reduce their overdraft facilities. In fact, Kenley (2002) notes that payment problems are deliberate; contractors hold up money and use it to pay other projects, or for their own benefits. Conversely Cotter (2005) suggests that late payments could be unintentional, although would also result in dire effects to players in the industry.

The construction industry is known for many unique characteristics which could primarily contribute to payment problems. The industry has no barriers to entry and is renowned for low capital backing, but relies heavily on cash flows to sustain its operations. This means companies or individuals with little capital base and very limited experience are able to set up construction businesses (Gibson, 2000; Pettigrew, 2005). Furthermore, in many construction projects subcontractors perform a substantial part (70-75% in some cases) of the total work (Gibson, 2000). The Australian Procurement and Construction Council (1996) reports that subcontractors perform 80-90% of the trade works associated with projects in Australia. This means that substantial upfront cash expenses would need to be sourced by these bottom tier parties to a contract. Consequently subcontractors are the worst hit by undercapitalized head contractors that cause severe financial difficulties to parties down the supply chain. The ability to sublet works arbitrarily is significant in payment problems associated with the construction industry (Sozen and Kucuk, 1999; Wu, Kumaraswamy and Soo, 2008). The Australian Procurement and Construction Council (1996) suggest that multi-tiered hierarchical structure, together with cascade payment obligations, causes late payments in the industry. This is exacerbated by the low restrictions to participants that lack skills and expertise entering the industry in Australia. This leads to improper financial management, which would then result in cash flow difficulties and eventual defaults in payment to trade creditors.

Abdul-Rahman et al. (2008) studied issues affecting payments in the construction industry and found that the perspectives of consultants and contractors differ on the causes of late payments. According to contractors, delay in certification, clients’ poor financial management, local culture/attitude, clients’ failure to implement good governance in business and underpayment of certified amounts by the clients are the most frequent causes of payment delays. Consultants identified local culture/attitude, delays in approval of claims by the client, and underpayment by the client as the top causes of payment delays. In summary the problems are traceable to clients’ poor financial management. Additionally, the industry has a culture of ‘work first, gets paid later’, which adds another dimension to the problem (Pettigrew, 2005). Other causes of payment issues, according to contractors and consultants in Malaysia include: the use of pay-when-paid clauses, disagreements on the valuation of work done, deliberate withholding of payments by clients, budget deficits for the year, poor communication and conflict between parties, delays in submitting contractors’ payment claims, and general lack of understanding of contract provisions (Danuri, et al., 2006).

Delving further into the issue, Ye and Rahman (2010) identified 40 factors which were then classified into 10 major groups. From Ye and Rahman’s list, cash flow problems due to clients’

poor financial management, ineffective utilization of funds, lack of capital to finance projects, failure to source money from banks in times of reduced sales, delay in releasing retention monies to contractors, and delay in evaluation and certification of interim and final payments, were found to be the top five factors responsible for late payments.

The foregoing review shows that the causes of payment problems are diverse and vary across countries. Some are largely attitudinal while others relate to inadequate processes that could ensure smooth cash flow within construction contracts. To add to the discourse on payment problems in the construction industry, the current study investigates the causes of payment default from a New Zealand perspective. Few empirical researches have covered the New Zealand situation and the current study approaches the investigation with the intent of seeking mitigations to anecdotal expressions of the prevalence of payment problems in New Zealand.

Research Approach

To address the objectives of the research, a survey questionnaire approach was used to collect opinions from research participants. The questionnaire enabled a determination of the factors causing payment problems in the wider New Zealand construction industry. The survey method is used in the study because it is highly efficient where a large sample selection from a pre-determined population is involved, and is relatively inexpensive (Kelley et al., 2003). Data collected through survey is treated statistically to draw inferences about the wider population. The literature reviewed indicates that payment problems within the construction industry are widespread and have ramifications for the whole of industry. A list of factors causing payment problems identified through literature review (Ye and Rahman, 2010; Pettigrew, 2005; Hughes, Hillebrant and Murdoch, 1998) was modified and considered by this study. A 5-point Likert scale ranging from 'Not at all Important = 1' to 'Extremely Important = 5' was employed to determine the degree of importance of the causes of payment problems. Although scales with three, seven and nine-point levels are used, a five-point scale is normally preferred (Moser and Kalton, 1985; Saunders, Lewis and Thronhill, 2007). This enables participants to spread their views across reasonably limited (5-point) response categories rather than having to select from a much more limited (3-point) or unreasonably large number (9-point) of response categories. Data obtained from the survey was analysed using Statistical Package for the Social Sciences (SPSS) 19.0. Inferences from the study are based on descriptive and inferential (independent samples t-tests, and factor analysis) statistical techniques.

An online questionnaire survey was administered to three major industry groups: consultants, head contractors and sub-contractors based in New Zealand. Participants were approached through their respective trade and professional associations (e.g. the New Zealand Institute of Architects, New Zealand Contractors Federation, New Zealand Institute of Quantity Surveyors and Project Managers Institute of New Zealand). The number of responses obtained from the three major industry groups is 60, 15 and 40 respectively. Since the responses from head contractors (N=15) were low, relative to other categories of participants (subcontractors = 40 and consultants = 60), the responses of head contractors and sub-contractors were merged and then compared with those of consultants. A scrutiny of the responses shows that there are similarities between the profiles (profession, number of years of experience, and number of projects undertaken) of these two groups (head contractors and sub-contractors) of participants.

As a first step, an independent samples t-test was performed to determine whether the two groups of participants i.e. consultants, and constructors (head contractors and subcontractors) have different views regarding payment problems. To determine the differences in views the following hypothesis was tested.

$H_0: \mu_1 = \mu_2$; there is no statistically significant difference between the two groups on the dependent variable, where μ_1 and μ_2 are the means of the two groups.

$H_1: \mu_1 \neq \mu_2$; there is a statistically significant difference between the two groups on the dependent variable

Following this, a factor analysis was performed to identify the overriding factors which industry players could focus on for improving payment situations in the New Zealand construction industry. The next section presents the findings in more detail and discusses the ramification of the results.

Findings and Discussion

Profile of Participants

Participants for the survey were required to indicate their profession, number of years of experience, and the number of projects they had undertaken since the implementation of the CCA in New Zealand. Table 1 provides a summary of the demographic profile of the participants. It shows that nearly equal percentages (25%) of the participants are architects and quantity surveyors while 15% and 13% are project managers and engineers respectively. Another 21% is categorized as 'others' which include service engineers (electrical, fire, security, air-conditioning, geo-technical, etc.), project directors, project coordinators, contracts manager etc. As per number of projects undertaken, 75% of the participants have undertaken more than 50 projects since the implementation of the CCA in 2003. The majority (over 70%) of the participants have practice experience of more than 20 years in the industry. This profile gives an indication of the reliability of the study findings.

Table 1: Demographic profile of participants

Demographic Information		Number	Percentage
Types of profession	Project Manager	17	15
	Engineer	15	13
	Architects	30	27
	Quantity Surveyors	27	24
	Others	24	21
No of projects undertaken	0 - 10	4	4
	11 - 20	6	5
	21 - 30	9	8
	31 - 40	5	4
	41 - 50	4	4
	Over 50	85	75
Number of years of experience	0 - 5	2	2
	6 - 10	10	9
	11 - 15	10	9
	16 - 20	11	10
	21 - 25	19	17
	More Than 25	61	54

Independent Samples t-test Results

Independent samples t-tests were performed on information obtained from the survey to compare the responses of consultants and constructors (head contractors and subcontractors) regarding the causes of payment problems. The result of the t-test is given in Table A (in

Appendix). It was observed that, all the listed causes, except economic and market conditions (p -value = 0.045), are not significant at 0.05 level of significance. This means that there is no statistically significant difference between the perceptions of subcontractors and head contractors regarding the causes of payment problems. The responses were therefore merged and compared with the responses of the consultant group.

Similarly Table A (in Appendix) presents the results of the t-test performed on the responses of Consultants and Constructors (head contractors and subcontractors combined). The result shows that all causal factors are not statistically significant at 0.05 level of significance. Therefore there is no statistically significant difference between consultants and contractors perspectives on the causes of payment problems in New Zealand. All research participants were in agreement with respect to the causes of payment problems on construction projects.

Importance of Causes of Payment Problems

Table 2 presents the causes of payment problems arranged in descending order of their mean values obtained based on the responses of all three industry groups. From Table 2, 17 causes with a mean value of 3.5 and above are considered the most important causes of payment problems in construction projects. The top ten important causes are cash flow difficulties due to delays and non-payments on other projects (mean = 4.01; s.d. = 1.07), disputes over claims and responses (mean = 3.88; s.d. = 1.00), cash flow difficulties due to lack of initial capital (mean = 3.85; s.d. = 1.16), easy exit of players (mean = 3.84; s.d. = 1.12), payment culture of the industry (mean = 3.83; s.d. = 1.02), attitude of the payer (mean = 3.81; s.d. = 1.32), improper supervision and financial control (mean = 3.81; s.d. = 1.17), easy entry of players (mean = 3.80; s.d. = 1.18), cost overruns and contract failure (mean = 3.79; s.d. = 1.15), and lack of knowledge and experience in the field (mean = 3.75; s.d. = 1.10). Therefore, it would seem that cash flow difficulties due to delays and non-payments on other projects and lack of initial capital are the most important items causing payment delays and losses in New Zealand.

From the results, it is apparent that the upper tier parties on any project need to ensure the smooth flow of money in order to meet their financial commitments to creditors. Project owners generally suffer from cash flow difficulties due to insufficient initial capital, failure to source adequate funding, and improper financial management. This is in line with previous studies (Ye and Rahman, 2010; Wu, Kumaraswamy and Soo, 2008) showing that payment problems primarily affect the cash flow of contractors and cascade down the supply chain. Touran, Atgun and Bhurisith (2004) also confirmed that cash flow problems affect industry survival and are one of the leading causes of contractors' failure. At the lower end of the supply chain, there is a cascade effect on subcontractors' payments. Furthermore, it is not uncommon for main contractors to delay payments so that their cash flow position could be improved during work progress (Motawa and Kaka, 2009; Ye and Rahman, 2010).

Disputes over payment claims and response to claims occur due to both the default of the payers and payees. Project owners and consultants are often criticised for making arbitrary deductions from contractors' payment claims, unreasonably withholding payments and delaying the issuance of responses to their payment claims in a bid to buy some time. Conversely contractors are blamed for claiming for uncompleted site works, over-claims, and delay in the submission of their claims. These generally create conflicts between parties and results in payments being withheld until disputes are resolved.

It would seem that the inherent characteristics of the construction industry encourage payment problems in the industry. The industry has relatively few barriers to entry and exit. This allows individuals and companies with little or no capital to start off businesses and as a consequence suffer from financial difficulties when the settlement of their payment claims becomes irregular. The industry has a unique payment culture which, in spite of the removal of conditional

payment provisions of pay-if-paid and pay-when-paid clauses from payment legislation, payment problems persist. In reality subcontractors are paid upon contractors being paid by project owners and payment follows that chain order: the owner pays the head contractor, who in turn pays subcontractors and so on down the supply chain in the industry. This is confirmed by Latham (1994), Pettigrew (2005), and Wu, Kumaraswamy And Soo (2008) who suggest that payment default results from the unique characteristics of the industry. It is not surprising that the construction industry has the highest business failure rates compared to other industries (Davies, 2009; Ashworth and Hogg, 2007).

Table 2: Causes contributing to payment problems in construction projects

Causes	N	Mean	Std. Dev.
Cash flow difficulties due to delays and non-payments on other projects	113	4.009	1.073
Disputes over payment claims and responses	113	3.876	1.002
Cash flow difficulties due to lack of initial capital	113	3.850	1.159
Easy exit of players: Little/no liability to creditors	112	3.839	1.120
Payment culture of the industry: Chain payment & work first get paid later	111	3.829	1.017
Attitude of the payer: dishonest/unethical conduct	112	3.813	1.319
Improper supervision and financial control	112	3.812	1.175
Easy entry of players with little/no capital backing	110	3.800	1.179
Cost overruns and contract failure	112	3.795	1.148
Lack of knowledge and experience in the field	114	3.754	1.102
High capital investment nature: Reliance on loan capital	109	3.633	1.144
Economic and market conditions	110	3.573	1.080
Time overrun of projects	112	3.562	1.191
Receivership and liquidation of parent and related companies	105	3.543	1.366
Disputes over quality of work	113	3.531	1.119
Administration/bureaucracy	113	3.531	1.103
Financial difficulties due to failure to secure contracts	106	3.519	1.173
Complications from contractual conditions	114	3.404	1.166
Financial difficulties due to drop in building prices	106	3.302	1.220
Procurement methods used	106	3.236	1.277
Contract types used	106	3.179	1.413
Standard forms of contracts used (right to payment and non-payment provisions)	111	3.144	1.313
Legislative procedures (Construction Contracts Act)	110	3.127	1.389
Disputes with debtors/creditors	106	3.104	1.219
Structure of the industry: Involvement of many commercial parties	114	3.062	1.214
Duration of projects (long-run or short-run)	108	3.028	1.241
Internal conflicts/disputes between owners or management team	103	2.942	1.153
Political/policy changes	102	2.628	1.289

Causes of Payment Problems - Factor Analysis

A factor analysis was conducted in order to reduce the large number of causes realised into smaller groups of underlying factors. Factor analysis enabled the clustering of causes that are highly inter-correlated into a limited number of independent factors.

As a first step, the suitability of use of factor analysis for the data set was verified using Bartlett’s test of sphericity and the Kaiser-Meyer-Olkin (KMO) statistic. Bartlett’s test of sphericity tests

the null hypothesis that variables are uncorrelated in the population. The Kaiser-Meyer-Olkin (KMO) statistic is used to measure sampling adequacy. Thus small values of the KMO statistic indicate that the correlations between pairs of variable cannot be explained by other variables and that factor analysis may not be appropriate. Generally a KMO of more than 0.50 is considered large enough to proceed with factor analysis (Gaur and Gaur, 2006). Table 3 provides the results of these two tests. As presented in Table 3, the significant Barlett's test statistic value of 1392.721 at $p < 0.05$ level confirms that the null hypothesis can be rejected, hence the use of factor analysis for the situation is appropriate. Further, the KMO statistic of 0.773 (> 0.50) obtained, confirms sampling adequacy of the data set for clustering.

Table 3: KMO and Barlett's Test

Statistical Tests		Results
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.773
Bartlett's Test of Sphericity	Approx. Chi-Square	1392.721
	df	378
	Sig.	.000

The next step in the factor analysis involves the extraction of underlying factors, which was done using principal axis factoring (PAF). Using the PAF method, 20 out of the 28 most important causes were able to be clustered into 6 factors. These 6 factors explain 67.6% of the total variance. Variables with factor loadings above 0.50 were considered when naming each factor. Since the six factors are likely to correlate with one another, an oblique rotation method was chosen as the best method to transform the factor matrix. In order to ensure the reliability and internal consistency between items (in the factor analysis) which make up the factors, Cronbach's alpha reliability coefficient was calculated (Mitchell, 1996 cited in Saunders, Lewis and Thronhill, 2007). The results of the factor analysis, factor loadings and Cronbach's alpha coefficients, are presented in Table 4.

Generally a Cronbach's alpha value above 0.70 is an accepted test for scale reliability (Gaur and Gaur, 2006). It is noted from Table 4 that four factors have an alpha value over 0.70 while the third factor (disputes and issues) has an Alpha value of 0.627. This shows that items comprising each factor have a strong internal consistency. Since the sixth factor (others) comprises a single item, an Alpha value cannot be calculated. The sixth factor is therefore excluded from the remaining discussion.

From the factor analysis, the first factor relates to contractual issues which comprise procurement methods, contract types, standard forms of contracts (payment provisions), and legislative processes (Construction Contracts Act) that are used in any project. These causal factors are clustered under *Contractual Issues*. The items that make up the second factor represent the financial side of industry players; thus this factor is named *Financial Strength of Industry Players*. The items comprising the third factor include disputes over payment claims and responses and quality of work, as well as involvement of many parties in the structure of the industry. It could be argued that the involvement of many parties trigger associated problems such as communication and coordination, time and payment delays which result in conflicts between parties. The factor is therefore labelled, *Disputes and Issues*. The fourth factor has three causes of delays which represent *Project Characteristics*. The final factor is named the '*Domino Effect*' as it describes the chain payment culture and cash flow difficulties due to payment delays and non-payments on other projects.

Table 4: Six factor solution for causes contributing to payment delays in construction projects

Causes	Factors						Cronbach's Alpha
	1	2	3	4	5	6	
Contractual issues (38.28% of variance)							.890
Procurement methods used	.896						
Contract types used	.958						
Standard forms of contracts used (payment provisions)	.945						
Legislative processes (Construction Contracts Act)	.720						
Lack of knowledge and experience in the field	.504						
Political/policy changes	.520						
Financial strength of industry players (10.55% of variance)							.865
Easy entry of players with little/no capital backing		.904					
Easy exit of players: Little/no liability to creditors		.873					
Cash flow difficulties due to lack of initial capital		.891					
Financial difficulties due to failure to secure contracts		.599					
Receivership and liquidation of parent and related companies		.522					
Disputes and issues (7.03% of variance)							.627
Disputes over quality of work			.743				
Disputes over payment claims and			.692				
Structure of the industry: Involvement of many commercial parties			.577				
Shortcomings of the process (4.83% of variance)							.772
Cost overruns and contract failures				.775			
Time overrun of projects				.567			
High capital investment nature: Reliance on loan capital				.511			
Domino Effect (4.25% of variance)							.708
Payment culture: Chain payment, work first get paid later					.735		
Cash flow difficulties due to delays and non-payments on other projects					.546		
Others (2.67% of variance)							
Improper supervision and financial control						.538	

Conclusions

Unlike previous studies that focused on the generic factors causing payment delays on construction projects, this study focused on the underlying factors causing payment problems, with the aim of devising ways of mitigating payment problems. The different study participants; consultants, head contractors and sub-contractors, in the industry held unanimous views regarding the causes of payment problems in New Zealand.

The study found that the top five out of 28 causes of payment problems in the New Zealand construction industry are; cash flow problems due to delays and non-payments experienced on

other projects, disputes over payment claims and responses, cash flow difficulties due to lack of initial capital, attitude of payers, easy exit of players, and the general payment culture of the industry. Subsequent clustering of the identified factors using a factor analysis provided knowledge on key areas which industry practitioners need to focus on in mitigating payment problems within the industry. From the factor analysis, the underlying factors for payment problems are six-fold: contractual issues, financial strength of industry players, disputes between players, project characteristics, the 'domino effect' and others. Most of the causes of payment problems fall under the clusters: financial strengths of industry players, project characteristics, and the 'domino effect'. It is safe to conclude that the domino effect is partly due to financial weaknesses of key construction industry players.

Thus the study concludes that the financial stability of players is central to payment problems in the construction industry. Stability of payment is ensured through a regular flow of cash during work progress and ensures that all parties' financial claims are able to be settled as and when they are due. Stable and regular payment seems to be the chief mitigating solution to payment problems in the construction industry. Adjustments to contractual provisions that could guarantee financial stability may include the procurement of some sort of financial security at the outset of a project. Thus any payment default is immediately indemnified by the security provider. It may also be worth incorporating mandatory requirements for prequalification of the financial status of critical funding parties to any contract. This way, vulnerable parties can be assured of the financial status of critical funding parties. The applicability of these few suggestions are recommended for further investigation as the current study is limited to identifying the key causes of payment problems. Further, the study recommends that the viewpoints of project owners are significant and should be collected in future study investigations as the current study had simply used consultants as proxies to project owners.

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Appendix

Table A: Independent samples t-test between head contractors and subcontractors

Causes of payment problems	Head contractor vs subcontractor					Consultant vs Contractor				
	Groups	Mean	t	df	Sig. (2-tailed)	Groups	Mean	t	df	Sig. (2-tailed)
Structure of the industry: Involvement of many commercial parties	Head contractor	2.800	-1.247	52	0.218	Constructors	3.074	-.135	109	.893
	Subcontractor	3.179				Consultants	3.105			
Payment culture of the industry: Chain payment & work first get paid later	Head contractor	3.929	0.565	51	0.575	Constructors	3.811	-.222	106	.825
	Subcontractor	3.769				Consultants	3.855			
High capital investment nature: Reliance on loan capital	Head contractor	3.667	0.18	49	0.858	Constructors	3.608	-.207	104	.837
	Subcontractor	3.590				Consultants	3.655			
Easy entry of players with little/no capital backing	Head contractor	3.462	-1.275	50	0.208	Constructors	3.827	.116	105	.908
	Subcontractor	3.949				Consultants	3.800			
Easy exit of players: Little/no liability to creditors	Head contractor	3.923	-0.005	51	0.996	Constructors	3.925	.481	107	.632
	Subcontractor	3.925				Consultants	3.821			
Administration/bureaucracy	Head contractor	3.267	-1.021	52	0.312	Constructors	3.500	-.460	109	.647
	Subcontractor	3.590				Consultants	3.596			
Cash flow difficulties due to delays and non-payments on other projects	Head contractor	4.143	-0.149	50	0.882	Constructors	4.173	1.519	109	.132
	Subcontractor	4.184				Consultants	3.864			
Cash flow difficulties due to lack of initial capital	Head contractor	3.929	-0.412	52	0.682	Constructors	4.019	1.457	109	.148
	Subcontractor	4.050				Consultants	3.702			
Financial difficulties due to failure to secure contracts	Head contractor	3.500	-0.433	50	0.667	Constructors	3.615	.918	102	.361
	Subcontractor	3.658				Consultants	3.404			
Financial difficulties due to drop in building prices	Head contractor	3.077	-1.49	50	0.143	Constructors	3.500	1.712	102	.090
	Subcontractor	3.641				Consultants	3.096			
Disputes over payment claims and responses	Head contractor	3.571	-1.466	51	0.149	Constructors	3.906	.227	109	.821
	Subcontractor	4.026				Consultants	3.862			
Disputes over quality of work	Head contractor	3.200	-0.56	49	0.578	Constructors	3.333	-1.724	109	.088
	Subcontractor	3.389				Consultants	3.700			
Internal conflicts/disputes between owners or management team	Head contractor	2.714	-0.602	48	0.55	Constructors	2.880	-.520	99	.604
	Subcontractor	2.944				Consultants	3.000			

Causes of payment problems	Head contractor vs subcontractor					Consultant vs Contractor				
	Groups	Mean	t	df	Sig. (2-tailed)	Groups	Mean	t	df	Sig. (2-tailed)
Disputes with debtors/creditors	Head contractor	3.385	0.617	50	0.54	Constructors	3.212	.882	102	.380
	Subcontractor	3.154				Consultants	3.000			
Receivership and liquidation of parent and related companies	Head contractor	4.000	1.199	49	0.236	Constructors	3.608	.257	101	.797
	Subcontractor	3.474				Consultants	3.538			
Procurement methods used	Head contractor	3.182	0.053	47	0.958	Constructors	3.163	-.631	103	.529
	Subcontractor	3.158				Consultants	3.321			
Contract types used	Head contractor	3.333	0.371	48	0.712	Constructors	3.200	.130	103	.896
	Subcontractor	3.158				Consultants	3.164			
Standard forms of contracts used (right to payment and non-payment provisions)	Head contractor	3.286	0.494	50	0.623	Constructors	3.135	-.230	107	.818
	Subcontractor	3.079				Consultants	3.193			
Legislative processes (Construction Contracts Act)	Head contractor	3.429	0.927	50	0.359	Constructors	3.135	-.030	106	.976
	Subcontractor	3.026				Consultants	3.143			
Attitude of the payer: dishonest/unethical conduct	Head contractor	3.857	-0.303	51	0.763	Constructors	3.943	.963	108	.338
	Subcontractor	3.974				Consultants	3.702			
Cost overruns and contract failure	Head contractor	3.467	-1.393	52	0.17	Constructors	3.796	-.115	108	.909
	Subcontractor	3.923				Consultants	3.821			
Complications from contractual conditions	Head contractor	3.533	0.24	53	0.811	Constructors	3.473	.627	110	.532
	Subcontractor	3.450				Consultants	3.333			
Improper supervision and financial control	Head contractor	3.786	-0.552	52	0.583	Constructors	3.926	.924	109	.358
	Subcontractor	3.975				Consultants	3.719			
Lack of knowledge and experience in the field	Head contractor	3.929	0.09	52	0.929	Constructors	3.907	1.146	110	.254
	Subcontractor	3.900				Consultants	3.672			
Duration of projects (long-run or short-run)	Head contractor	3.308	0.395	50	0.694	Constructors	3.192	1.191	105	.236
	Subcontractor	3.154				Consultants	2.909			
Time overrun of projects	Head contractor	3.231	-1.072	51	0.289	Constructors	3.528	-.620	108	.537
	Subcontractor	3.625				Consultants	3.667			
Economic and market conditions	Head contractor	3.143	-2.052	52	0.045	Constructors	3.593	-.090	106	.929
	Subcontractor	3.750				Consultants	3.611			
Political/policy changes	Head contractor	2.385	-0.872	48	0.388	Constructors	2.640	-.027	99	.978
	Subcontractor	2.730				Consultants	2.647			