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Risk of Late Payment in the Malaysian Construction Industry

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***Abstract*—**The purpose of this study is to identify the underlying causes of late payment from the contractors' perspective in the Malaysian construction industry and to recommend effective solutions to mitigate late payment problems. The target groups of respondents in this study were Grades G3, G5, G6 and G7 contractors with specialization in building works and civil engineering works registered with the Construction Industry Development Board (CIDB) in Malaysia. Results from this study were analyzed with Statistical Package for the Social Science (SPSS 15.0). From this study, it was found that respondents have highest ranked five significant variables out of a total of forty-one variables which can caused late payment problems: a) cash flow problems due to deficiencies in client's management capacity (mean = 3.96); b) client's ineffective utilization of funds (mean = 3.88); c) scarcity of capital to finance the project (mean = 3.81); d) clients failure to generate income from bank when sales of houses do not hit the targeted amount (mean=3.72); and e) poor cash flow because of lack of proper process implementation, delay in releasing of the retention monies to contractor and delay in the evaluation and certification of interim and final payment (mean = 3.66).

***Keywords*—**Underlying causes, late payment, construction industry, Malaysia.

I. Introduction

LATE payment problem is endemic in construction and needs to be explicitly recognized as this problem recurs from project after project. Payments, which implies a major problem as monies, is needed to pay for materials, labour, plant, subcontractors' account rendered, preliminaries and general overheads expended during the progress of the work [26]. When the flow of money into a business is delayed, the net cash flow will become negative. When this happens, the contractor would require immediate funding to overcome the cash deficit. Therefore, late payment affects time, cost and quality as good quality construction requires prompt payment, so that progress would not be affected.

Some practitioners may think that delays in payment are common place in the Malaysian construction industry. It could be argued that there are core individuals who believe that late payment is acceptable [12]. This kind of perception has exacerbated the problems of late payment and makes it more difficult to deal with. Therefore, the risk of late payment in the construction industry can be adversarial and disastrous. Late payment will affect cash flow of a company and may eventually lead to company's insolvency. Timeliness of payment is important to circumvent the risk of late payment problem. Why is that the payment is late when the economic is bad and the payment is also late even if the economic is good? Once a payment problem starts to expand, it typically gets worse over time [15] and will shift the financial burdens from one participant to other participant and create cash flow problem.

Clients have become more demanding, more discerning, and are less willing to accept risk (Flanagan, 2002). It is normal practice for some clients to shift some risks to other parties further down the chain by reducing their financing costs through delaying of payments. This will shift the financial burden to the contractors who may not have large capital assets and large amounts of credit available to cover payment delays.

Hendrickson's (2003) postulated in his research is parallel with that of Davis' (1999) who claimed that the adage of strategic cash flow is to "collect early and pay late". This has created a dilemma in which delayed of payment is a two-edged sword. This will also create serious problem while contributing to the large number of insolvencies in the construction industry. A common scenario is for clients to hold back the money as long as possible whereas contractors wish to obtain their money as soon as possible. Hence, late payment is a predicament which is difficult to be dealt with due to different interests of the parties involved. The identification of the underlying causes of late payment and the recommendations of effective solutions is essential to mitigate this problem.

A. Cash Flow in Construction Project

Late payment problem is interrelated with the cash flow problem. Cash flow in the construction industry is critical because of the relatively long duration of projects. Any deviation due to either project delays or cash flow delays can have major impact on the project [4]. Most construction projects are individual profit centers, each with its own cash cycle based on the costs of activities related to the project and on payments from a client as prescribed in a contract [19].

The times for receiving payments from the client will affect cash flow of a project. Many construction projects have negative net cash flows until the very end of construction when the final payment is received or advanced payment is received before starting the project [19]. The delay of payment from owners will affect the cash flow of the contractor and retainage withheld by the owner will also create cash flow problem to the

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contractor. When taking into consideration the payment delayed from owners and negative cash flow of contractors, prompt payment from owners in this circumstance is utmost important to minimize financial hardship of a contractor. The cash flow requires the combination of estimating and planning evaluations in which estimating evaluate the use of resources in terms of time. Adding both of these together is to obtain the cash flow [16] as cash flow, profits and growth can all be adversely affected [12]. Longer payment periods mean that other participants in the downstream supply chain will and can become cash starved, forcing greater reliance on borrowing. They will also seek to impose longer payment periods on downstream sub-subcontractors and suppliers [28]. In relation to advancing or borrowing additional capital to fund cost overruns, there will be an increment in interest cost in collecting on another defaulted promise [36].

B. Purpose of the Paper

This paper aims to identify the underlying causes of late payment and to determine the effective solutions to mitigate risks of late payment in the Malaysian construction industry. From the critical review of literatures, the relationships among late payment variables in the construction industry which may contribute to late payment will be described and elaborated.

C. Significance of the Paper

There seems to be an agreement between the parties that if owners pay general contractors on time, then the timing of general contractors' payments to their subcontractors can be improved significantly. The timeliness of payment has further emphasized the importance of prompt payment from clients to main contractors to ensure the payment obligation further down the chain would not be affected [5].

Disruptions of cash flow caused by late payment depending on the extent and duration of delayed payment can significantly affect the daily operations of small businesses [24]. Promptness of payment is critical to ensure normal operation of construction companies and not to affect their daily activities. Again, there seems to be consensus between the overwhelming majority of contractors' and public agencies that monthly payment are not made on time by public agencies despite the fact that standard agreement forms and general provisions (Ministry of Public Works, 1979; General Directorate of Highways, 1979b; Turkoglu and Egemen, 1980) explicitly define the timing of those payments. In particular, the timing of payment is a key element of firms' profitability performance [20], [33], [17] as cash is the most important of a construction company's resources.

Efforts to identify these factors that contribute to delay in payment at a more in-depth level would guide and help the industry in the search for appropriate corrective actions to mitigate these problems. The objectives of this research would help to mitigate late payment problems in the Malaysian construction industry and to redefine understanding of the construction industry players in a developing country, the Malaysian, towards the problem of delayed payments.

II. RISK OF LATE PAYEMENT AND THE CONSTRUCTION INDUSTRY

In a related study by Wong and Hui (2006), the risk of failure to pay by owner is among the risk factors which affects the construction's project time and/or cost. Late or delayed payment from clients can be categorized as financial risks which involve high level of uncertainty. Managing financial and economic risks are important because these risks may cause a negative impact on the cash flow, endanger a project's viability and limit profitability [37]. Financial risks come from several sources encompassing all causes that lead to possible delays on clients' payment [4].

Risk of delayed payment from owner will impact the duration and cost of the project. These risks cause the project's cost to increase abnormally and subsequently delay the progress of the project [27]. Zou *et al*. (2007) pointed out that project funding problems have been identified as cost-related risks, time-related risks and quality-related risks which can significantly influence the delivery of construction project. This implies the significance of funding problems of construction projects to mitigate cost-related risks.

As a result of delayed payments, financial stress can occur due to inaccurate cash forecasts and/or deficiencies in cash flow management [21]. Proper cash flow management plays a strategic role even when a firm is not facing financial stress [9]. Contract conditions and penalty clauses are often used to pass risks "down the line" by allocating them to organizations in the supply and production chain. The organization least able to carry the risk such as the small specialist contractor has to accept the risk or not win the work. As a result, the parties down the line will be more vulnerable to the risk of late payment.

III. RESEARCH METHOD

This research project is based on a combination of exploratory and descriptive study. It is an exploratory study because its goal of this research project is to identify the underlying causes of late payment where there has been little research conducted in this area. Besides that, the researcher was uncertain of the perceptions of the respondents towards these problems. Findings reported from these early explorations have provided new and valuable insights into the area of delayed payment in the construction industry. This research also paves the way for more sophisticated and theoretically relevant studies in future [30].

The study is also descriptive as it is used for the purpose of describing a group's behavior to identify the underlying causes of late payment from the perceptions of the contractors. A survey was used in this study for the purpose to elicit the contractors' perception regarding late payment issues in the construction industry [18]. The main theme of this research is to describe what is prevalent to a group of people; in this case the group was contractors.

A. Sample Population, Design and Methods

In a survey, it is impractical to interview all possible respondents. However, inferences based on a subset of the whole aggregate may be fairly accurate [25]. It is a common in social research to work with samples rather than populations, particularly when the population of contractors in Malaysia is large. In the Malaysian construction industry, 63,150 contractors registered with the Construction Industry and Development Board (CIDB) since 31st December until 28th February 2008. A sample is a selection of elements (members or units) from a population and is used to make statement about the whole population. Sample can be selected with or without replacement. In this research, sampling without replacement is selected. It is tedious and expensive to study such large populations in the construction industry [10]. The target groups of respondents in this study were Grades G3, G5, G6 and G7 contractors with specialization in building works and civil engineering works. These four grades of contractors were selected to be representative of different categories of contractor consisted of small, medium and large size. This is important to ensure the consistency of respondents being selected and to waive the biases that only certain size of contractor is being selected. The contractor's registration scheme and the characteristics of local contractors registered with Construction Industry Development Board (CIDB) are as classified in Table I and II. Stratified sampling provides measure to obtain a representative sample. This begins by dividing the population into segments, or strata [22]. Stratified sampling can be used in combination with simple random sampling to ensure that particular categories in the population are represented in the sample in the same proportions as in the population, and then the population can be stratified according to these grades of contractors for instance G3, G5, G6 and G7 in Construction Industry Development Board (CIDB) [10].

The response rate for this survey was 10.2%. The relatively low response rate of the questionnaire survey might due to the sensitivity of the topic of research as payment was the main issue of concern. Most of the respondents deemed this information as confidential and reluctant to share the information.

TABLE I
CIDB CONTRACTOR'S REGISTRATION SCHEME

Registration Requisites	CIDB
Financial capacity	Minimum paid up capital is RM 5,000
Bumiputera equity	Not required
Foreign equity	ASEAN countries – not more than 41% Non-ASEAN countries – not more than 30%
Track record and performance	Required
Personnel resources	Required
Company status	Registration required with Registrar of Businesses or Companies

(Source: The construction industry development board, CIDB)

TABLE II
CHARACTERISTICS OF LOCAL CONTRACTORS CLASSIFICATIONS

Grade	Tendering Capacity	Paid Up Capital*/Net Capital Worth** (RM)	Contractor Categories (Size)
G7	No limit	750, 000.00	Large
G6	Not exceeding 10 million	500, 000.00	Medium
G5	Not exceeding 5 million	250, 000.00	Medium
G4	Not exceeding 3 million	150, 000.00	Medium
G3	Not exceeding 1 million	50, 000.00	Small
G2	Not exceeding 500,000.00	25, 000.00	Small
G1	Not exceeding 100,000.00	5, 000.00	Small

(Source: The construction industry development board, CIDB)

Notice:

* Paid Up Capital (for Private Limited Company/Public Company)

** Net Capital Worth (For Sole Proprietorship/Partnership) in the form of current account bank statement (average balance considered) /balance from saying account/overdraft facilities/uncharged fixed deposit statement/ASB/ASN shares

IV. RESULTS AND DISCUSSION

The Statistical Package for the Social Science (15.0) was used as a tool of data analysis to analyze the findings from the questionnaire survey. Table III contains the information of the respondents' demographic details which were classified into three broad categories, namely current job position, years of experience in the construction industry and the company's main business activity. Generally, majority of the respondents who took part in the study held the positions of CEOs, managers, directors and other managerial posts which had further increased the reliability of this research. Though majority of the respondents had been involved in the industry for one (1) to five (5) years but the second highest category is from eleven (11) to fifteen (15) years of experience. The diverse categories of the respondent's main business activity symbolized that the findings of the research comprises of a wide variety of contractors in the Malaysian construction industry. This also shows that the main contractors in Malaysia rely to a great extent of sub-contractors to carry out majority of the work.

TABLE III
FREQUENCY DISTRIBUTION FOR THE PROFILE OF THE RESPONDENTS

Demographic categories	Category breakdown	Frequency	Percent (%)
Job Position	CEOs, Managers, Directors, and other Managerial Posts	61	59.8
	Senior Executive	14	13.7
	Executive	24	23.5
	Administration Officer	2	2.0
	Others	1	1.0
Years of Experience	1 - 5	45	44.1
	6 - 10	17	16.7
	11 - 15	21	20.6

	16 - 20	5	4.9
	>20	14	13.7
Company's Main Business Activity	Main Contractor	72	70.6
	Sub-contractor:		
	Building Works	39	38.2
	Civil and Structural Works	33	32.4
	Mechanical and Electrical Works	13	12.7
	Infrastructure Works	22	21.6
	Architectural Works	13	12.7

As delineated in Table IV, majority of the respondents' company involved in both public and private construction projects which make up 54.9%. This was followed by the respondents' involvement in both public and private construction projects which makes up 29.4% and 15.7%, respectively. This has signified that the respondents' have been involved in both public and private sector projects.

TABLE IV
TYPES OF PROJECT THE COMPANY'S INVOLVED

Project Funding	Frequency	Percent	Valid Percent	Cumulative Percent
Government Funded Project	16	15.7	15.7	15.7
Private Funded Project	30	29.4	29.4	45.1
Both	56	54.9	54.9	100.0
Total	102	100.0	100.0	

Table V shows the severity of late payment in private sector (Mean = 2.89) was more significant than the government sector (Mean = 2.50). Thus, payment in private sector is more keen to late payment compare to public sector.

TABLE V
SEVERITY OF LATE PAYMENT N PUBLIC AND PRIVATE CONSTRUCTION PROJECTS
RATE: 1=least significant to 4=most significant

Types of Project	Severity of Late Payment 1	2	3	4	Mean	Std. Deviation	Rank
Govern-ment	16 15.7 %	25 24.5 %	23 22.5 %	14 13.7 %	2.50	1.004	2
Private	5 4.9%	30 29.4 %	27 26.5 %	27 26.5 %	2.89	0.894	1

Table VI demonstrates that eighty percent (80%) of the respondents considered late payment for few days says, less than five (5) working days was acceptable and the remaining twenty percent (20%) was on the contrary. This could be due to the inherent culture of late payment in the Malaysian construction industry that the respondents perceived late payment for few days were acceptable. From the output in Table VI, the chi-square value is significant with the calculated p-value was less than 5% level of significance ($p<0.05$). There is a significant differences in the frequency of perspectives towards the acceptable duration of late payment and the homogeneity of variance assumption has been violated ($p<0.05$) [11]. The results show that the respondents are largely accepted that less than five (5) days of late payment is acceptable.

TABLE VI
ACCEPTABILITY OF LATE PAYMENT

Late Payment for few days is acceptable?	Yes No	Yes Percent (%)	No No	No Percent (%)	Chi-square test χ^2	Significant (p)
Less than five (5) working days	80	78.4	20	19.6	36.00	<0.001[a]

Notes: [a] significance p<0.001

As demonstrated in Table VII, the respondents perceived that the acceptable duration of late payment range from a minimum of three (3) days to 45 days. Therefore, the contractors accepted that the limit of acceptable delayed payment from the clients was 45 days while some of them only deemed payment delay for three (3) days was acceptable.

TABLE VII
ACCEPTABLE DURATION OF LATE PAYMENT

	Range	Min	Max	Sum	Mean	Std. Deviation	Var.
Acceptable Days	42	3	45	860	12.46	9.058	82.05

As showed in Table VIII, most of the respondents (58.8%) did not incorporate risk of late payment when bidding for a project and only 40.2% of the respondents incorporated risk of late payment when bidding for a project. On the contrary, a majority of the respondents (75.5%) will price differently for a project with a client who tends to pay late and a client who tends to pay promptly. Contractors have traditionally used high mark-ups to cover risk but this approach is no longer effective when their margins have become smaller [8]. Only 24.5% of the respondents will price exactly the same under the same circumstances. In a study conducted by Bases in 2004, a bid price must consider the customers or clients financial position which means that the offered price should take into consideration the client's financial conditions and cash flow needs. Thus, only around 25% of the respondents will price exactly the same under the same circumstances. From the output in VIII, the chi-square value for incorporation of risk of late payment and pricing of project are significant with the calculated p-value was less than 5% level of significance ($p<0.05$). There is a significant difference in the frequency of perspectives towards the incorporation of risk of late payment and pricing of project with the client who tends to pay late ($p<0.05$) [11]. The results show that the respondents largely did not incorporate risk of late payment but they will price

differently with the clients who are incline to pay late.

In comparisons of both results, it can be concluded that respondents were not aware of the meaning of incorporation of risk of late payment when bidding for a project. These respondents had actually unconsciously priced differently to cater whether the clients can pay for what is being offered. Therefore, it can be deduced that respondents have poor understanding on the incorporation of risk of late payment when bidding for a project. These respondents had actually unconsciously priced differently to incorporate the risk of late payment without themselves realizing it. This finding was parallel with the findings found in the research conducted by Thevendran and Mawdesley (2004), in which only a small percentage of the respondents (17%) have experienced in risk management in industries such as plant operations and the oil industry. This unanimously proved that the understanding of risk in the construction industry is far behind when compared with other industries. The outlooks found in the study conducted by Thevendran and Mawdesley (2004) also recommended that practitioners tend to view risks in their particular domain. In a recent study conducted by Wong and Hui in 2006 further supported this findings by delineated that the contractors may inflate the tender price if the employer's have poor reputation of honouring payment on time. Consequently, majority of the respondents have priced differently for a project with a client who tends to pay late. This result is also equivalent with the findings conducted by Smith and Bohn (1999) which found out that adequacy of clients' project financing and ability of clients to pay on time affect mark-ups.

TABLE VIII
INCORPORATION OF RISK OF LATE PAYMENT WHEN PRICING FOR A PROJECT

Risk of Late Payment	Yes		No		Chi-square test	
	No	Percent (%)	No	Percent (%)	χ^2	Significant (p)
Incorporation of Risk of Late Payment	41	40.2	60	58.8	53.353	<0.001[a]
Pricing of Project	77	75.5	25	24.5	26.510	<0.001[a]

Notes: [a] significance p<0.001

Descriptive statistic in Table IX shows the significance of the underlying causes of late payment from the contractors' perspective. It can be observed that majority of the significant underlying causes of late payment were derived from the first category of late payment due to the client's poor financial management. Out of forty-one variables identified, the respondents have highest ranked five significant variables which can cause late payment problem. The top three highest ranked underlying causes of late payment was cash flow problems due to deficiencies in client's management capacity with a mean value of 3.96, followed by client's ineffective utilization of funds with a mean value of 3.88 and scarcity of capital to finance the project with a mean value of 3.81. The forth most significant underlying causes of late payment was caused by clients failure to generate income from bank when sales of houses do not hit the targeted amount (mean=3.72) which was categorized under the main causes of late payment due to insufficient financial resources. This is followed with the underlying causes of late payment due to poor cash flow because of lack of proper process implementation, delay in releasing of the retention monies to contractor and delay in evaluation and certification of interim and final payment with the same mean value of 3.66.

As demonstrated in Table X, the research identified five most effective solutions to mitigate late payment out of twenty-two variables. The respondents have highest ranked to understand and research the owner's ability to pay as the most effective solution in mitigation of late payment problems with mean value of 3.89. Ranked in second was to solve late payment by implementation of the Construction Industry Payment and Adjudication Act with mean value of 3.69. This was followed with negotiation of payment terms with client to facilitate a healthy cash flow with a slightly different mean value of 3.68. Ranked in fourth was to curb late payment by obtaining payment due before handover of project to client with mean value of 3.67. This was then followed closely with the importance to understand and study the payment requirement of each individual project with mean value of 3.66.

V.CONCLUSION

This paper focus on the identification of the underlying causes of late payment and to recommend effective solutions to mitigate late payment problem in the Malaysian construction industry. It can be summarized that from the research conducted, it was found that the most significant underlying causes of late payment are cash flow problems because of deficiencies in client's management capacity (mean=3.96), client's ineffective utilization of funds (mean=3.88), scarcity of capital to finance the project (mean=3.81), clients failure to generate income from bank when sales of houses do not hit the targeted amount (mean=3.72), poor cash flow because of lack of proper process implementation, delay in releasing of the retention monies to contractor and delay in evaluation and certification of interim and final payment share the same mean value of 3.66 with p-value less than 1% level of significance.

The validation interviews further supported the findings of the questionnaire survey on the most significant underlying causes of late payment. Five out of eight selected respondents with at least ten years of working experience in the construction industry agreed with the top ranked underlying causes of late payment which is cash flow problem due to deficiencies in client's management capacity. However, to determine the effective remedies to mitigate risks of late payment it was apparent that the respondents have highest rank, to understand and research the owner's ability to pay as the most effective solution in mitigation of late payment problems (mean=3.89), implementation of the Construction Payment and Adjudication Act (mean=3.69), negotiation of payment terms with client to facilitate a healthy cash flow (mean=3.68), obtaining payment due before handover of project to client (mean=3.67), to understand and study the payment requirement of each individual project (mean=3.66) and implementation of financial management to ease cash flow problems (mean=3.65).

Generally, the findings from the validation interviews supported the findings from the questionnaire survey on the most effective

TABLE IX
UNDERLYING CAUSES OF LATE PAYMENT

Main Causes	Sub-Causes	Significance of Late Payment					Min.	Max.	Mean	Std. Deviation	Rank
		1	2	3	4	5					
Client's Poor Financial Management	Cash flow problems because of deficiencies in client's management capacity	3 (2.9%)	10 (9.8%)	17 (16.7%)	36 (35.3%)	35 (34.3%)	1	5	3.96	1.091	1
	Client's ineffective utilization of funds	4 (3.9%)	10 (9.8%)	28 (27.5%)	29 (28.4%)	30 (29.4%)	1	5	3.88	1.122	2
	Poor cash flow because of lack of proper process implementation	1 (1.0%)	15 (14.7%)	27 (26.5%)	34 (33.3%)	24 (23.5%)	1	5	3.66	1.089	5
	Overlook the ripple effect of economic downturn on cash flow	7 (6.9%)	9 (8.8%)	44 (43.1%)	23 (22.5%)	13 (12.7%)	1	5	3.31	1.084	22
	Scarcity of capital to finance the project, for instance, client's need money to roll	8 (7.8%)	6 (5.9%)	19 (18.6%)	39 (38.2%)	28 (27.5%)	1	5	3.81	1.190	3
	Financial failure due to bankruptcy or winding up of paymaster other business activity	15 (14.7%)	16 (15.7%)	15 (14.7%)	20 (19.6%)	34 (33.3%)	1	5	3.55	1.444	10
Insufficient financial resources	Clients failure to generate income from bank when sales of houses do not hit the targeted amount	2 (2.0%)	9 (8.8%)	25 (24.5%)	39 (38.2%)	24 (23.5%)	1	5	3.72	0.986	4
	Clients underestimate the time period and the cash flow from the investment	4 (3.9%)	11 (10.8%)	29 (28.4%)	42 (41.2%)	12 (11.8%)	1	5	3.50	0.925	13
	Clients inaccurate forecasting of market demand when pre-selling property	3 (2.9%)	15 (14.7%)	35 (34.3%)	29 (28.4%)	16 (15.7%)	1	5	3.42	1.034	17
	Shortage allocation of fund from sources of funding when contract sum increased due to Variation Orders	2 (2.0%)	7 (6.9%)	40 (39.2%)	29 (28.4%)	20 (19.6%)	1	5	3.57	0.966	9
	Clients loan from bank not in place to pay the contractors	3 (2.9%)	15 (14.7%)	26 (25.5%)	34 (33.3%)	19 (18.6%)	1	5	3.57	1.136	9
	Banks refuse to provide credit facilities to small construction company due to instable financial position	5 (4.9%)	16 (15.7%)	25 (24.5%)	33 (32.4%)	19 (18.6%)	1	5	3.43	1.171	16
Paymaster's withholding of payment	Clients deliberate delay for their own financial advantage	1 (1.0%)	13 (12.7%)	33 (32.4%)	32 (31.4%)	19 (18.6%)	1	5	3.61	1.018	7
	Delay in releasing of the retention monies to contractor	0 (0%)	10 (9.8%)	35 (34.3%)	32 (31.4%)	20 (19.6%)	2	5	3.66	0.940	5
	Wilful withholding of payment for personal reasons	7 (6.9%)	29 (28.4%)	24 (23.5%)	19 (18.6%)	18 (17.6%)	1	5	3.11	1.245	25
Conflict and poor communication among parties involved	Client's lack of trust with the consultants in certification of contractors progress claim and Variation Orders	9 (8.8%)	29 (28.4%)	25 (24.5%)	24 (23.5%)	10 (9.8%)	1	5	3.05	1.133	27
	Lack of understanding on clients' requirement for variation of works	9 (8.8%)	23 (22.5%)	31 (30.4%)	30 (29.4%)	5 (4.9%)	1	5	3.04	1.053	28
	Difficulties in reaching settlement	3 (2.9%)	19 (18.6%)	32 (31.4%)	37 (36.3%)	7 (6.9%)	1	5	3.32	0.938	21
	Disagreement of the valuation of work done	3 (2.9%)	16 (15.7%)	37 (36.3%)	17 (16.7%)	15 (14.7%)	1	5	3.26	1.048	24
Local culture/attitude	General perception of participants in construction industry who think that delay for few days is acceptable	4 (3.9%)	10 (9.8%)	46 (45.1%)	28 (27.5%)	12 (11.8%)	1	5	3.38	1.003	19

	Contractors will accept late payment from clients as they are always at the mercy of the clients	6 (5.9%)	10 (9.8%)	40 (39.2%)	23 (22.5%)	21 (20.6%)	1	5	3.61	1.004	7
	Clients assume contactors will finance the project in advance in the event of late payment from them	8 (7.8%)	11 (10.8%)	35 (34.3%)	25 (24.5%)	21 (20.6%)	1	5	3.61	1.004	7
Financial market instability	Increment of interest rate in repayment of loan	11 (10.8%)	21 (20.6%)	37 (36.3%)	25 (24.5%)	3 (2.9%)	1	5	2.95	1.045	30
	Increment of foreign exchange rate	15 (14.7%)	27 (26.5%)	31 (30.4%)	18 (17.6%)	5 (4.9%)	1	5	2.72	1.188	32
	Inflation	6 (5.9%)	18 (17.6%)	19 (18.6%)	33 (32.4%)	22 (21.6%)	1	5	3.59	1.249	8
Delay in certification/poor documentation	Delay in evaluation and certification of interim and final payment	1 (1.0%)	13 (12.7%)	26 (25.5%)	37 (36.3%)	21 (20.6%)	1	5	3.66	1.011	5
	Involvement of too many parties in the process of honoring interim certificate	4 (3.9%)	12 (11.8%)	32 (31.4%)	35 (34.3%)	17 (16.7%)	1	5	3.53	0.940	11
	Bureaucracy or inefficient procedures of payment process practiced by clients	4 (3.9%)	13 (12.7%)	29 (28.4%)	27 (26.5%)	25 (24.5%)	1	5	3.51	1.088	12

TABLE IX (CONT"D)
UNDERLYING CAUSES OF LATE PAYMENT

Main Causes	**Sub-Causes**	**Significance of Late Payment**					**Min.**	**Max.**	**Mean**	**Std. Deviation**	**Rank**
		1	**2**	**3**	**4**	**5**					
Consultant's quantity surveyor	Underpaid claims	4 (3.9%)	13 (12.7%)	36 (35.3%)	30 (29.4%)	15 (14.7%)	1	5	3.39	1.057	19
	Consultant's quantity surveyor not a quality management system company	9 (8.8%)	20 (19.6%)	30 (29.4%)	29 (28.4%)	10 (9.8%)	1	5	3.01	1.092	29
	Slow processing and delay in finalizing of variations and final accounts	3 (2.9%)	10 (9.8%)	36 (35.3%)	29 (28.4%)	22 (21.6%)	1	5	3.64	1.041	6
Contractor's default	Contractor's capital lock-up	3 (2.9%)	19 (18.6%)	34 (33.3%)	31 (30.4%)	13 (12.7%)	1	5	3.45	1.075	15
	Contractor's do not research paymaster ability to pay when tender for a project	3 (2.9%)	17 (16.7%)	34 (33.3%)	34 (33.3%)	12 (11.8%)	1	5	3.41	1.019	18
	Contractors submit incomplete payment claims	11 (10.8%)	18 (17.6%)	31 (30.4%)	28 (27.5%)	12 (11.8%)	1	5	3.11	1.277	25
	Contractors delay in submitting claims	20 (19.6%)	19 (18.6%)	28 (27.5%)	26 (25.5%)	7 (6.9%)	1	5	2.81	1.341	31
	Contractors do not incorporate financial charges when bidding for project with poor payment record	9 (8.8%)	22 (21.6%)	36 (35.3%)	21 (20.6%)	11 (10.8%)	1	5	3.08	1.202	26
	Financial blunder the contractor underpriced the project costs during tender	2 (2.0%)	23 (22.5%)	35 (34.3%)	28 (27.5%)	12 (11.8%)	1	5	3.30	1.082	23
	Willing to accept onerous payment term from clients due to difficulties in obtaining project	6 (5.9%)	21 (20.6%)	27 (26.5%)	27 (26.5%)	17 (16.7%)	1	5	3.35	1.221	20
Contractor's work performance	Contractor's poor quality of work lead to client's dissatisfaction	2 (2.0%)	16 (15.7%)	35 (34.3%)	30 (29.4%)	14 (13.7%)	1	5	3.46	1.036	14
	Contactors work do not adhere to required standard of specification	4 (3.9%)	16 (15.7%)	30 (29.4%)	26 (25.5%)	13 (12.7%)	1	5	3.39	1.120	19

Friedman test: Chi-Square = 215.654; p<0.001

TABLE X
POSSIBLE SOLUTIONS IN MITIGATION OF LATE PAYMENT PROBLEMS

Solutions	Effectiveness					Min.	Max.	Mean	Std. Deviation	Rank
	1	2	3	4	5					
Reschedule work to help client ease their cash flow	11 (10.8%)	18 (17.6%)	34 (33.3%)	27 (26.5%)	9 (8.8%)	1	5	3.03	1.139	18
Mutual discussions of problems with employer to address the problems in a timely manner	3 (2.9%)	15 (14.7%)	32 (31.4%)	35 (34.3%)	14 (13.7%)	1	5	3.45	0.982	13
Sign another supplementary agreement with the employer to reduce the rate of work due to insufficient budget from sources of funding	11 (10.8%)	21 (20.6%)	37 (36.3%)	21 (20.6%)	9 (8.8%)	1	5	3.05	1.134	17
Contractors should submit timely accurate invoices with complete documents	4 (3.9%)	14 (13.7%)	28 (27.5%)	30 (29.4%)	23 (22.5%)	1	5	3.49	1.093	12
Contractors should chase payment due relentlessly	8 (7.8%)	15 (14.7%)	36 (35.3%)	28 (27.5%)	12 (11.8%)	1	5	3.26	1.088	16
Finance and accounting team reviews what is required for timely project billing and prompt payment	3 (2.9%)	11 (10.8%)	30 (29.4%)	40 (39.2%)	14 (13.7%)	1	5	3.49	0.922	12
Negotiate payment terms with client to facilitate a healthy cash flow	3 (2.9%)	4 (3.9%)	34 (33.3%)	37 (36.3%)	21 (20.6%)	1	5	3.68	0.904	3
Train and educate all parties on the effects of payments on the project progress	7 (6.9%)	6 (5.9%)	29 (28.4%)	39 (38.2%)	17 (16.7%)	1	5	3.53	1.072	11
Contractor's entitlement to establish legal lien in Malaysia	9 (8.8%)	12 (11.8%)	38 (37.3%)	17 (16.7%)	22 (21.6%)	1	5	3.39	1.208	14

Friedman test: Chi-Square =100.570 ; p<0.001

Solutions	Effectiveness					Min.	Max.	Mean	Std. Deviation	Rank
	1	2	3	4	5					
Requires the owner to provide the owner's payment guarantee or bond	8 (7.8%)	9 (8.8%)	33 (32.4%)	14 (13.7%)	34 (33.3%)	1	5	3.63	1.262	7
Understand and study the payment requirement of each individual project	3 (2.9%)	11 (10.8%)	23 (22.5%)	38 (37.3%)	23 (22.5%)	1	5	3.66	1.027	5
Implementation of Construction Industry Payment and Adjudication Act	3 (2.9%)	11 (10.8%)	26 (25.5%)	22 (21.6%)	30 (29.4%)	1	5	3.69	1.148	2
Understand and research the owner's ability to pay	1 (1.0%)	5 (4.9%)	20 (19.6%)	47 (46.1%)	25 (24.5%)	1	5	3.89	0.863	1
Obtain payment due before handover of project to client	5 (4.9%)	8 (7.8%)	31 (30.4%)	23 (22.5%)	30 (29.4%)	1	5	3.67	1.181	4
Implementation of financial management due to ease cash flow problems	4 (3.9%)	9 (7.8%)	23 (22.5%)	41 (40.2%)	21 (20.6%)	1	5	3.65	1.083	6
Provide the contractor rights to either suspend work or reduce the rate of work	4 (3.9%)	18 (17.6%)	25 (24.5%)	26 (25.5%)	25 (24.5%)	1	5	3.57	1.163	9
Contractors are encouraged to complain to Biro Aduan Negara (BAN) and assured them that this will not affect them in securing future works	6 (5.9%)	16 (15.7%)	29 (28.4%)	19 (18.6%)	28 (27.5%)	1	5	3.52	1.203	12
Impose penalty of interest to late payers	9 (8.8%)	20 (19.6%)	18 (17.6%)	26 (25.5%)	25 (24.5%)	1	5	3.45	1.277	13
The authority should list down the late payers in the industry	5 (4.9%)	18 (17.6%)	22 (21.6%)	23 (22.5%)	30 (29.4%)	1	5	3.59	1.247	8
Apply term loan from bank to cover the consequences of late payment	9 (8.8%)	15 (14.7%)	32 (31.4%)	22 (21.6%)	19 (18.6%)	1	5	3.32	1.209	15
Clients with cash flow problems to bond with the capital market to get credit to fund the project	2 (2.0%)	7 (6.9%)	41 (40.2%)	32 (31.4%)	17 (16.7%)	1	5	3.55	0.946	10
Contractors should mark up the tender price they submit for a project with bad payment record	19 (18.6%)	9 (8.3%)	38 (37.3%)	23 (22.5%)	10 (9.8%)	1	5	2.98	1.203	19

solutions in mitigation of late payment problems regardless some differences in the ranking of these solutions. Six out of eight selected respondents with at least ten years of working experience agreed with the highest ranked solution which is to understand and research the owner's ability to pay in mitigation of late payment. This study highlighted some significant points to be aware by the contractors before embarking on any construction projects. The practitioners in the construction industry are encouraged to have an insight into these problems of late payment in searching for effective solutions. This measurement will be helpful in avoid repeating the same mistakes in future projects. Future recommendations for this study are to identify the underlying causes of late payment from the clients' perspective and to make comparison with the findings in this study.

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