Architecture Image Studies
AIS Scientific Journal

Vol.6, Issue 3, pp.1-16, 2025
DOI: https://doi.org/10.62754/ais.v6i3.179

https://journals.ap2.pt/index.php/ais/index

General Factors, Dispute, and Human Factors Shaping Late Payment Issues in the Malaysian Construction Sector: A Path to Sustainability

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Abstract

The construction industry plays a significant role in Malaysia's economy; however, late payments remain a critical issue that disrupts projects and impacts financial stability. This study analyzes the primary causes of late payments in privately funded projects from the perspective of G7 contractors relying on the PAM Form of Contract and registered with the Construction Industry Development Board (CIDB). Questionnaires based on existing studies were distributed through random sampling using a quantitative methodology. The research focused on 15 key aspects categorized under three main headings: general characteristics, disputes, and human factors. Additionally, it considered post-pandemic impacts, which have often been overlooked in previous studies. Data analysis was conducted using SPSS and Smart PLS. The main variables identified include financial market volatility, inflation, employers withholding payments, ineffective financial management, lack of funds allocated for variation orders, banks refusing credit, conflicts over authorized payment amounts, certification delays, ambiguous contract terms, policy changes, and violations of prompt payment practices. After testing three hypotheses, recommendations were made for more equitable terms, such as implementing a Payment Security Bond and an associated contractual clause. By enhancing the financial sustainability and resilience of Malaysia's construction industry, the report offers practical strategies to improve payment procedures, benefiting contractors, legislators, and industry stakeholders.

Keywords: Primary Factors, General and Human Factors, Disputes, Late Payment, PAM Form of Contract, Financial Sustainability, Economic Growth.

Introduction

The construction industry has expanded rapidly and contributes substantially to the nation's overall economic growth through income generation, capital accumulation, and job creation, all of which enhance Malaysia's socioeconomic development and Gross Domestic Product (GDP). The construction industry is central to the implementation of the revolutionary economic policies outlined in the Madani Economic Framework in the 2024 Budget. According to CIDB Malaysia (2024), key budget commitments include RM27 billion for infrastructure projects, RM24.7 billion for people's housing projects, and an additional billion for the remodeling of government quarters, as well as federal road and bridge maintenance. The Master Builders Association Malaysia (MBAM) acknowledges the support provided by the 2024 Budget; however, despite these encouraging developments and significant investments, the construction industry requires increased resources to meet rising demands, sustain growth, manage escalating costs, and ensure proportional contract terms.

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Before embarking on any projects, contractors must carefully evaluate the payment risks. There are significant risk events that compromise the execution of construction projects, which have been identified by Amoah and Pretorius [1], including subcontractor and main contractor obstacles, payment delays, unforeseen site circumstances, and poor contingency planning. Prompt and effective payment is essential to the success of a project [2, 3]. Consistent cash flow is crucial to the construction industry, which is distinguished by lengthy project durations, high costs, and credit-based operations. Given its financial dynamics, the construction industry requires a steady flow of progressive payments in a timely manner to remain competitive [3-5]. Late payments disrupt the construction supply chain, causing project delays, cash flow constraints, increased expenses, and even insolvency [6]. Construction enterprises may be forced to shut down as a result of the extreme financial burden caused by withholding or delaying payments [7, 8]. Since they need to maintain financial liquidity to manage their responsibilities, including payments to suppliers and subcontractors, main contractors are especially susceptible to late payments [9].

Payment problems are a worldwide issue. Such problems are common in both rich and emerging economies, according to Liu et al. [10]. Late payments are prevalent in the Middle East, which can lead to cash flow problems and project delays. Due to restricted access to bank credit and late payments, contractors in the United Arab Emirates are exposed to substantial financial risks [11]. Similar to this, even if India's construction industry is expanding at a rate of 6.3% per year (2024–2027), late payments impair contractors' cash flow and drive out a large number of small businesses [12, 13]. With 75% of construction companies reporting delays, late payments are common in the UK. Contractors' financial health is strained because they frequently wait another month after the agreed-upon terms to be paid. 65% of UK contractors reported slower payments during the COVID-19 pandemic, making the problem worse [14, 15]. Similar issues are facing Australia, where the construction sector is struggling with post-pandemic late and non-payments [16, 17]. Financial instability among industry participants is another issue facing New Zealand's construction sector, underscoring the significance of steady cash flow for project continuity [18]. Key elements influencing cash flow in Vietnam were highlighted by Lee and Brown [19] and included tax liabilities, loan payments, retention regulations, construction expenses, and macroeconomic conditions.

One important sector that makes a substantial contribution to Malaysia's economic growth is the construction industry. However, it frequently faces a host of difficulties that jeopardize its expansion and viability. The issue of late payments is one of the most important and enduring problems in this industry. Malaysia is not an exception to the issue of late payments. The financial stability of contractors is impacted by employers' late or postponed progress payments [20]. Unreasonable payment delays or non-payment are common complaints from contractors. According to a recent study, conflicts pertaining to payments predominate in Malaysian construction litigation [21, 22]. Payment delays increase in frequency and severity as projects become larger and more complex. Both public and commercial projects are affected by this problem, and industry disputes are further exacerbated by the culture of late payments [23, 24]. There are problems with Malaysian construction projects, such as payment problems for the contractors involved, despite the fact that the sector is one of the fastest-growing in the nation, Halimin and Roshdi [25]. Kamil et al. [26] agreed that despite the construction industry's long history, there are still major payment problems in the sector. The construction industry, especially the private sector, will be concerned about this.

Given the seriousness of Malaysia's late payment problem, the goal of this study is to examine the main causes of contractors' continued occurrence of it. By identifying the underlying causes, the study aims to provide insights and policy recommendations that help improve cash flow management, reduce conflicts, and enhance the overall efficiency of the construction industry. These quotes from earlier researchers serve as the impetus for this study, which seeks to investigate the ongoing issue of late payments in Malaysia's construction sector from the perspective of principal contractors, who are particularly at risk because they oversee project completion.

Literature Review

For contractors, payment-related problems pose a serious risk, especially in the construction sector, since non-payment or delayed payments can result in disputes, financial instability, and project failures. Risks such as unanticipated circumstances and late payments are major causes of construction project failures, claims, and disputes [1]. Delays in payments are a common concern in Malaysia, especially for Grade G7 contractors. This leads to cash flow issues, delays in projects, and even possible bankruptcy [7, 27]. Since construction projects require a significant amount of money and take a long period, efficient payment methods are essential to project success [2]. According to Paudel et al.

[5], making progress payments on schedule is essential to preserving financial stability because late payments can cause cash flow problems, which can result in project delays, increased expenses, and insolvency [6]. Similar problems with delayed payments are present in the worldwide construction industry, which is aggravated by the COVID-19 pandemic and includes the Middle East, India, the UK, and Australia [14, 28]. In Malaysia, disagreements in the public and commercial sectors are frequently caused by late payments [21, 29, 30]. The study focuses on Grade G7 contractors in Malaysia, examining the reasons for late payments and proposing methods to enhance project completion and financial stability.

General Contributing Factors

Seven major sub-factors exacerbate financial delays, with general issues accounting for a large portion of contractors' late payment issues. First, employers are forced to reallocate expenditures when variation orders (V.O.) result in budget deficiencies due to unanticipated changes in design or site conditions [31]. Financial mismanagement, erroneous cost estimates, and budgetary restrictions all contribute to payment delays, which impair contractors' cash flow and project advancement [32, 33]. Second, employers' ability to fulfill payment obligations is limited by a lack of financial resources, which arises from inadequate financial planning, unforeseen expenses, and economic downturns [34, 35]. Due to this financial burden, companies are forced to prioritize other costs over contractor payments, which damages employer-contractor relationships by causing work stoppages, staff reductions, and renegotiated supplier conditions [36]. Third, project funding is impacted by underestimating investment cash flow as a result of market volatility, economic instability, and inadequate financial management, which causes payments to be delayed and puts pressure on contractors' ability to control operating expenses [37]. Persistent delays prompt contractors to stop operations or seek alternative financing, which increases financial risks because they rely on on-time payments to fund ongoing work [38]. Fourth, employers' liquidity is impacted by financial market volatility, as recessions, rising interest rates, and falling stock prices all reduce the amount of money available for projects [39]. International projects are further impacted by currency exchange fluctuations, which force employers to prioritize debt or necessary expenses over contractor payments [36]. These disturbances impair the financial flow of contractors, leading to delays in projects and problems with trust [32]. Fifth, contractors find it challenging to control their budgets due to rising labor and material prices caused by inflation [20]. Financially strapped employers might postpone payments, and contract modifications like price escalation provisions lead to more disagreements [40]. Contractors are forced to use credit facilities due to payment delays, which raises financial constraints and puts project completion at risk [41]. Sixth, the COVID-19 epidemic made it more difficult for employers to make on-time payments by upsetting supply chains and postponing project timelines [42]. Cash flow problems were worsened by lockdowns, safety rules, and material shortages, which resulted in additional payment delays [43]. Due to increased expenses and interrupted operations, contractors were forced to borrow money, which further strained their finances and demonstrated how susceptible the sector is to worldwide disturbances [44]. Lastly, because of their dependence on credit facilities, employers are at risk when banks deny loans due to their poor creditworthiness or financial standing [45]. Employers are forced to postpone contractor payments while attending to other financial needs due to the disruption of liquidity caused by limited credit availability [46]. Many businesses find it difficult to maintain cash flow without bank working capital, which exacerbates delays and causes disruptions to construction projects [47]. Better financial planning, more robust regulatory enforcement, and enhanced risk management are necessary to address these problems and guarantee a steady and on-time payment environment for contractors.

H1: General factors have a significant positive impact on late payment issues faced by contractors in Malaysia.

Dispute / Disagreement Contributing Factors

Four major sub-factors exacerbate delays, and disputes and disagreements are major contributors to late payment concerns in the construction industry. Payment rejections or drawn-out approval procedures are frequently the result of stakeholder conflict and misunderstanding, especially with regard to payment applications, variation orders, and billing problems [48]. In addition to creating disagreements, missing documentation, regulatory non-compliance, or misaligned expectations can also affect project cash flow and postpone payments [49]. Delays may worsen if contractors find it difficult to express problems clearly. Employers may purposefully withhold payments due to disagreements over contract terms, work quality, or project scope. They may also use these payments as leverage in disputes that require mediation or litigation, which further prolongs financial insecurity [23]. The second sub-factor is employers' lack of confidence in consultants' ability to handle progress

claims and variation orders, which can lead to mistrust and unwillingness to approve payments. Ineffective communication from consultants, inaccuracies in suggestions, or a lack of knowledge may prompt companies to seek third-party assessments, lengthening payment cycles [6]. Disagreements regarding consultants' assessments and contract ambiguities frequently cause payment delays as employers want extra clarifications and evaluations before allocating funds [50]. Furthermore, arguments over the valuation of completed work are common as a result of varying perceptions of quality, progress, and contractual compliance [51]. Employers may enforce stronger criteria than initially agreed upon, resulting in disagreements about whether the work meets requirements, and contractors' documentation may fail to meet employers' expectations [52]. Subjective evaluations and a lack of mutual agreement on scope revisions might complicate payment approvals, resulting in cash flow concerns for contractors and hindering project development [53]. Finally, a lack of awareness of employer criteria for variations exacerbates disagreements, as poorly documented or ambiguous modification orders cause reluctance to approve further payments [2]. Miscommunication about scope changes, cost consequences, or time repercussions frequently leads to payment delays, putting a financial burden on contractors [54]. Without sufficient documentation, these issues grow, necessitating legal action or extended negotiations that interrupt project timetables [55]. Late-stage modifications increase risks, costs, and resource management difficulties, especially if employer expectations are misunderstood or not properly documented [18]. Inadequate variation documentation not only causes payment delays but can also result in legal disputes, rework, and other disruptions to project execution [56, 57]. Addressing these dispute-related problems necessitates better communication, clearer documentation, and proactive conflict-resolution procedures to ensure timely payments and seamless project execution.

H2: Disputes have a significant positive impact on late payment issues faced by contractors in Malaysia.

Human Factors Contributing Factors

Contractors' late payment concerns are heavily influenced by the human element, which includes four important sub-factors. First, the presence of various stakeholders in the production of interim payment certificates hinders the approval process due to miscommunication, competing priorities, and arguments about job valuation and contract terms [58]. The administrative overhead of organizing approvals, maintaining proper documentation, and executing timely inspections further delays payments [59]. Legal requirements for approved signatures increase the possibility of disputes and delays [60]. Second, employers frequently believe that contractors can finance projects in advance despite late payments, assuming that contractors have financial reserves, loans, or credit facilities to manage cash flow shocks [49]. Progress payments linked to milestones reinforce this assumption, although extended payment delays can cause severe financial strain, halt project progress, and increase the risk of insolvency for contractors who rely on timely payments to cover labor, materials, and subcontractor costs [16]. Third, contractors will often tolerate late payments to maintain long-term connections with employers and secure future contracts, despite the financial pressure [61]. Late payments have become industry norms, with contractors waiting an average of 94 days for payment, forcing many to rely on credit cards or personal finances to manage cash flow [62]. Legal contract stipulations like "pay-if-paid" or "pay-when-paid" limit contractors' capacity to demand immediate payment, forcing them to continue working despite late payments to avoid conflicts or legal implications [63]. Finally, late payments have become the norm in some areas due to lax enforcement of payment terms, a lack of sanctions for late payers, and a widespread view that postponing payments favors employers [64]. This normalization reduces accountability within employer groups because delayed payments are not regarded as a severe concern [65]. However, this method places a tremendous burden on contractors' finances, affecting their capacity to continue operations, maintain job quality, and complete projects on time [66]. Addressing this systemic issue necessitates a culture shift that raises awareness of the negative consequences of late payments, imposes stronger payment restrictions, and advocates for fair and transparent payment systems. Implementing better legislative frameworks, enhancing stakeholder communication, and cultivating trust between contractors and employers can help offset the negative consequences of late payments and create a more sustainable payment environment in the construction industry.

H3: Human factors have a significant negative impact on late payment issues faced by contractors in Malaysia.

Conceptual Framework

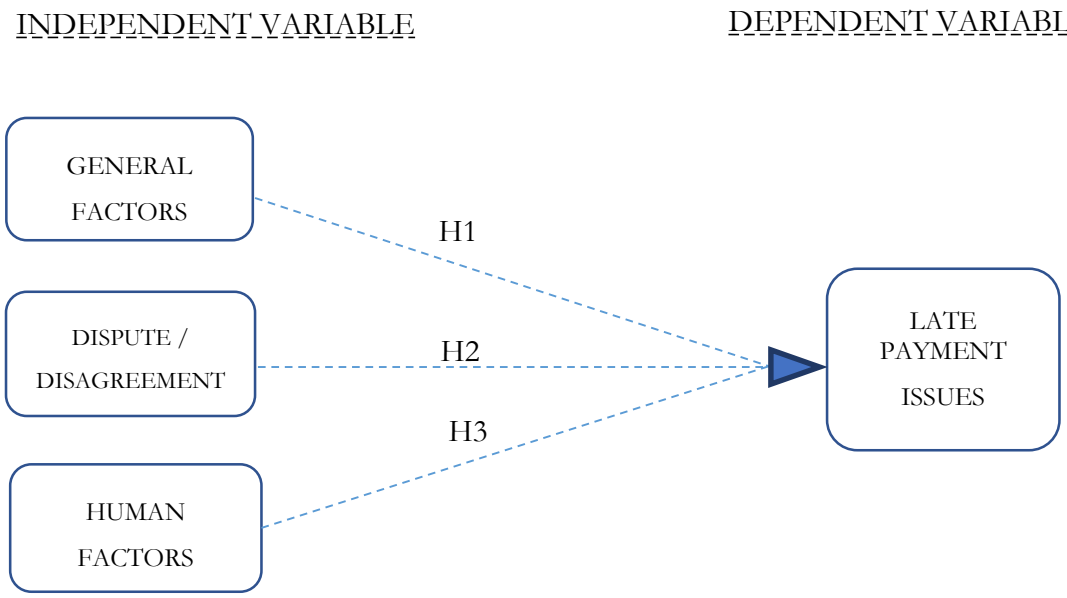

Figure 1: Conceptual Framework.

Research Methodology

This study utilized a quantitative methodology [55]. Participants received questionnaires online. A non-probability sampling strategy was used [67]. G7 contractors, defined as individuals who are or have been involved in the construction of private sector building projects, were chosen at random from the CIDB website. The decision to concentrate primarily on G7 contractors arises from their critical importance in Malaysia's construction industry. G7 contractors work on large-scale projects, operate under complex contractual arrangements, and confront distinct financial constraints that set them apart from lower-grade contractors [68]. These characteristics make them especially prone to the systemic causes and consequences of late payment concerns. Furthermore, insights from G7 contractors provide significant data for solving macro-level concerns, which could benefit the entire sector [69]. Of the 420 contractors surveyed, 399 responded. According to Cohen's 1992 sample formulas, only 166 respondents are necessary. This study uses PLS-4 (PLS-SEM) data analysis to identify the mediating link between the General Factors (S3D), Disputes (S3E), and Human Factors (S3F) on the impact of late payment difficulties (S4) experienced by contractors in Malaysia's construction industry.

Results and Discussion

Table 1: Demographic Profile

Variables	Item	Frequency	Percentage
Experienced	0-5 years	229	57.4
	6-10years	77	19.3
	11-15years	41	10.3
	>16years	52	13.0
Late Payment	Yes	350	87.7
	No	49	12.3
Final Payment	Never	19	4.8
	Rarely	24	6.0
	Sometimes	138	34.6

	Often	119	29.8
	Very Often	99	24.8
Interim Payment	Never	27	6.8
	Rarely	38	9.5
	Sometimes	146	36.6
	Often	132	33.1
	Very Often	56	14.0
Advanced Payment	Never	77	19.3
	Rarely	155	38.8
	Sometimes	137	34.3
	Often	14	3.5
	Very Often	16	4.4
Form of Contracts Used	PAM 2018 (With Quantities)	204	51.1
	PAM 2018 (Without Quantities)	69	17.3
	Others	126	31.6
Duration of Days Payment Delayed	0 – 10 Days	91	22.8
	11 – 20 Days	71	17.8
	21 – 30 Days	57	14.3
	> 30 Days	180	45.1

Source: Compiled by Author

The demographic study presents the following distribution among respondents: The first section of the questionnaire (S1) focused on respondents' construction sector experience. 58.6%, or 234 respondents, have 5 years or less of job experience, while 18%, or 72, have 6 to 10 years. 12.8%, or 51, have over 16 years of experience, and 10.5%, or 42, have between 11 and 15 years. Most respondents have 0 to 5 years of experience. The lowest number came from individuals with 11 to 15 years of experience. This period is significant as it is when a senior contractor's quantity surveyor negotiates with the consultant quantity surveyor on contractual disputes, including late payment issues. They typically have helpers with less than 5 years of experience to assist with the contractor's claims. Section 2 (under S2-1) of the questionnaire revealed that 351 respondents, or 88%, confirmed that their company has experienced late payment concerns over the last 5 years. Conversely, 48 respondents, or 12%, have never encountered late payment difficulties. Section 2 under S2-2 compared three types of payments: final payment, interim payment, and advance payment. The final payment has the highest mean score for the most occurrences of late payment, at 3.662, followed by the interim payment at 3.376, and the advance payment at 2.346. According to question S2-3, 204 respondents, or 51.1%, used the PAM Form of Contract, 2018 (With Quantities), as the formal contract signed with their employer. Additionally, 69 respondents, or 17.3%, used the PAM Form of Contract, 2018 (Without Quantities), and 126 respondents, or 31.6%, used another form of contract for which they did not specify the name. As shown in Table 1 (under section S2-4), 45.1%, or 180 respondents, encountered late or deferred payments by more than 30 days from the contract date, whereas 22.8%, or 91 respondents, received payment within 10 days. 71 respondents, or 17.8%, experienced late payments between 11 and 20 days, while 14.3%, or 57 respondents, faced late payments between 21 and 30 days.

Construct Reliability

Table 2: Construct Reliability and Validity of Actual Test.

Items	Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
S3D1	0.803	0.792	0.822	0.864	0.615
S3D2	0.814				
S3D3	0.833				
S3D4	0.678				
S3E1	0.898	0.683	0.865	0.794	0.568
S3E3	0.628				
S3E4	0.709				
S3F3	0.953	0.695	0.984	0.853	0.746
S3F4	0.763				
S4-1	0.785	0.814	0.822	0.870	0.573
S4-2	0.783				
S4-3	0.708				
S4-6	0.797				
S4-7	0.709				

Source: Compiled by Author

Table 2 shows an actual test's construct reliability and validity assessment, which uses statistical metrics to determine the internal consistency and validity of several constructs. The table contains several items (e.g., S3D1, S3E1, S3F3, S4-1) and their respective factor loadings, Cronbach's alpha, composite reliability (rho_a and rho_c), and average variance extracted (AVE). These metrics assist in establishing whether the study's constructs are credible and valid for further examination.

The factor loadings show how each item correlates with its respective construct. Most of the loadings exceed the acceptable threshold of 0.70, indicating substantial links between the items and their constructs. However, certain components, such as S3D4 (0.678) and S3E3 (0.628), have slightly lower values, implying smaller contributions to their respective constructs. Despite this, their inclusion may still be justified on theoretical grounds or overall model fit.

Cronbach's alpha values range from 0.683 to 0.814, indicating an acceptable level of internal consistency. In general, a value greater than 0.7 is deemed reliable, and while some values fall slightly below this threshold, they remain within an acceptable range for exploratory research. This suggests that most items within each construct consistently assess the same underlying concept.

The composite reliability (rho_a and rho_c) values are all greater than 0.8, with a few above 0.85, indicating good internal reliability. Composite dependability is frequently considered a better measure than Cronbach's alpha since it takes into account each item's actual contribution to the construct. The excellent composite reliability ratings imply that the constructs are clearly specified and consistently measured.

Finally, the average variance extracted (AVE) values range from 0.568 to 0.746, with all structures exceeding the minimum threshold of 0.50. This indicates strong convergent validity, meaning that the items within each concept sufficiently explain the variance in their respective latent variables. Higher AVE values, such as 0.746, suggest that these constructs account for a significant portion of the variation, thereby strengthening the test's validity.

Overall, Table 2 demonstrates that the constructs utilized in the actual test are very reliable and valid, with most metrics falling within acceptable limits. The test has good internal consistency and construct validity, making it a reliable measurement tool for additional statistical research.

Discriminant Validity

Table 3: Heterotrait-Monotrait Ratio (HTMT) – Matrix

	S3D	S3E	S3F	S4-
S3D				
S3E	**0.647**			
S3F	0.537	**0.659**		
S4-	0.389	0.191	**0.266**	

Table 3 under the heading "Heterotrait-Monotrait Ratio (HTMT) - Matrix" displays the HTMT values for multiple constructs labeled S3D, S3E, S3F, and S4-. In structural equation modeling, the HTMT approach evaluates construct discriminant validity by comparing the average correlations between constructs (heterotrait-heteromethod) to the average correlations within a single construct (monotrait-heteromethod).

The values in this matrix range from 0.191 to 0.893, with the strongest HTMT value, 0.893, observed in the association between S3D and S3E, indicating that these constructs are highly connected and may even suggest measurement overlap. It is generally believed that HTMT scores greater than 0.85 indicate a deficiency in discriminant validity; however, depending on the needs of the study, a threshold of 0.90 may also be used.

The matrix represents the various levels of construct correlation. Several pairs, particularly those involving S3E, have values close to or above the 0.85 limit, indicating difficulties with discriminant validity. This could imply that numerous constructions measure similar underlying events or features, particularly those in the S3 series. The fact that the correlations with S4 are less than for other constructs suggests that this one is measuring something different.

The findings highlight the need for further study on construct definitions and measurement instruments. To ensure distinctness, constructions with high HTMT values may need to be re-specified or clarified. Reevaluating the measurement approach may also be advantageous in ensuring that each construct is accurately captured an important component of the validity and reliability of the research findings.

To ensure reliable and authentic study outcomes, this analysis provides a thorough understanding of the components' interactions and highlights potential areas for measurement model improvement.

Table 4: Fornell-Larcker Criterion

	S3D	S3E	S3F	S4-
S3D	**0.784**			
S3E	0.471	**0.754**		
S3F	0.386	0.419	**0.863**	
S4-	0.328	0.141	0.223	**0.757**

Table 4 shows the Fornell-Larcker criterion, a widely used technique for assessing discriminant validity in structural equation modeling. This criterion compares each construct's correlations with those of other constructs to the square root of its average variance extracted (AVE). When the square root of the AVE exceeds the maximum correlation with any other construct, the construct has a higher variance with its measurements than with other constructs.

For each build, the diagonal components in the matrix denote the square root of the AVE. S3D (0.784), S3E (0.754), and S3F (0.863) are the values and amounts, respectively. These numbers serve as reference points for examining off-diagonal values and correlations between constructs. The off-diagonal entries depict the relationships between the structures. To demonstrate discriminant validity, each diagonal value in a row and column must exceed the corresponding off-diagonal values.

Construct S3D (General Factors): The square root of AVE (0.784) exceeds its best correlation (0.494 with S5), demonstrating discriminant validity.

Construct S3E (Disputes): Discriminant validity is supported by the square root of AVE (0.754), which exceeds the maximum correlation (0.627 with S3).

Construct S3F (Human Factors): The high square root of AVE (0.863) ensures robust discriminant validity, lowering all correlations with other variables, particularly the highest at 0.485 (with S3B).

According to the Fornell-Larcker criterion analysis, the study's constructs all have appropriate discriminant validity, with each construct's square root of the AVE greater than the corresponding inter-construct correlations. This confirms the model's unique constructs by demonstrating that each construct is more closely related to its indicators than to any other construct. These findings improve the dependability of the measurement model and provide a solid foundation for future structural model investigations and theoretical inferences.

Path Coefficient

The beta coefficient is defined as the amount by which the outcome variable varies for every unit change in the predictor variable [70]. Path coefficients usually lie between -1 and +1 in significance; values closer to +1 imply significant positive correlations, while values closer to -1 indicate strong negative relationships [71]. A number indicates each independent variable's influence on the dependent variable; the higher the value, the greater the influence of the IV on the DV [72].

Table 5 shows the results of a structural equation modeling (SEM) investigation. The study examines the relationships between various predictors (S3D and S3E) and the dependent variable (S4-). The table contains several essential statistics, including the original sample path coefficient (O), sample mean (M), standard deviation (STDEV), T-statistics (|O/STDEV|), and P-values. These measurements are critical for understanding the importance and strength of the hypothesized links.

Table 5: Path Coefficients and Significance Testing

Path Coefficient (O):	This shows how strongly and in which direction the independent and dependent variables are related to one another. An inverse relationship is indicated by negative values, whereas positive values show a positive relationship.
Sample Mean (M)	By calculating the average route coefficient from several samples, the central tendency is estimated.
Standard Deviation (STDEV)	Calculates the variability of path coefficients between samples. Lower values indicate greater consistency.
T-statistics (|O/STDEV|)	The path coefficient being zero is the null hypothesis that this statistic attempts to test. When the t-value exceeds 1.96, a greater absolute value indicates a more significant outcome.
P-values	Let us consider the likelihood that the observed link is the result of chance. 0.05 and 0.01 are common criteria for significance.

Table 6: Mean, STDEV, T values, P values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
S3D (general) -> S4(impact)	0.221	0.217	0.063	3.534	0.000
S3E (dispute) -> S4(impact)	-0.181	-0.148	0.086	2.116	0.034
S3F(human) -> S4(impact)	0.093	0.090	0.061	1.516	0.130

Table 6 presents the mean, standard deviation (STDEV), T values, and P values for the correlations between the dependent variable S4- and the predictors (S3D, S3E, and S3F). With a P-value of less than 0.001 and a T-statistic of 3.534, the route coefficient from S3D to S4 is 0.221, indicating a highly significant positive correlation. With a T-statistic of 2.116 and a P-value of 0.034, the route coefficient from S3E to S4 is -0.181, showing a statistically significant negative correlation. Lastly, the path coefficient from S3F to S4-, which is 0.093 with a T-statistic of 1.516 and a P-value of 0.130, indicates a non-significant association. These results demonstrate that S4 and other predictors,

including S3F, do not significantly correlate, and that S3E has a significant negative impact on S4 while S3D has a significant positive impact.

Discussion

H1: General factors have a significant positive impact on late payment issues faced by contractors in Malaysia.

Based on Table 6, the result of H1 statistics shows a β value of 0.221, a t value of 3.534, and a p-value of 0.000. These results meet the benchmark criteria, where the t value is greater than 1.96 and the p-value is less than 0.05. Therefore, Hypothesis 1 is supported.

This study identifies numerous important variables that contribute to late payment concerns for contractors, including insufficient finances owing to variation orders, underestimated cash flow, financial market volatility, inflation, pandemics, and banks' unwillingness to grant credit. Contractors agree that these factors significantly impact timely payments, which is consistent with Husnain et al. [73] and Haron and Arazmi [7], who emphasize market instability induced by monetary policies, COVID-19, geopolitical conflicts, and commodity price fluctuations. Sukomardojo et al. [74] found that pandemic-induced delays worsen economic instability. Voigt et al. [46] discovered that bank refusals cause financial constraints, resulting in project delays of up to nine months and labor overruns of approximately 15%. Kalyan et al. [75] underlined that such refusals increase interest charges, requiring contractors to seek legal counsel and disrupting cash flow and project timetables. According to Liu et al. [10], low financial resources impact job quality and efficiency due to reliance on loans.

H2: Disputes have a significant positive impact on late payment issues faced by contractors in Malaysia.

The result of H2 statistics is that the β value is 0.181, the t value is 2.116, and the p value is 0.034; it meets the benchmark where the t value is greater than 1.96, and the p value is less than 0.05. Thus, Hypothesis 2 is supported.

This study reveals important dispute-related causes generating late payments in construction projects, including communication problems, employer mistrust in consultants, disagreements on job valuation, and a lack of awareness of variation needs. These findings accord with Goh et al. [21], who highlighted delays, poor cost management, financial concerns, and divergent contract interpretations as important causes of disputes. Serpell and Torres [76] identified design flaws and nonpayment as major drivers of late payments. Kalyan et al. [75] found a high relationship between poor performance-related disagreements and payment concerns. Odenigbo et al. [51] cited conflict overvaluations and sluggish processing of variation orders as common causes in Nigeria. According to Isiofia et al. [77], Allegations such as price escalation, modification orders, and delays can lead to disagreements. Payment conflicts have a significant impact on contractors' cash flow, delaying projects and straining financial stability, as demonstrated by Hadi et al. [78] and Adaku et al. [64].

H3: Human factors have a significant negative impact on late payment issues faced by contractors in Malaysia.

Based on H3 statistics, the β value is 0.093, the t value is 1.516, and the p value is 0.034; it did not meet the benchmark where the t value is higher than 1.96, but the p value is less than 0.05. Thus, Hypothesis 3 is not supported.

The participation of numerous parties in certifying payments, employers' presumptions that contractors would pre-finance projects, contractors' tolerance of late payments, and cultural norms that allow slight delays were all examined in this study as human factors thought to affect late payments. Contrary to previous research, the results show no discernible detrimental effect of these characteristics on late payments. According to Perera et al. [12], Malaysian cultural traditions cause payments to be delayed, which impacts contractors' cash flow and increases their risk of insolvency. Stewardson et al. [14] highlighted enforceable ethical business norms and observed late payment concerns in the UK as a result of non-adherence to payment schemes. According to Mayouf and Gilligan [79], whereas timetable flexibility encourages late payments, a culture of promptness minimizes delays. Assumptions of contractor tolerance for delays have been found to disrupt cash flow, postpone subcontractor payments, delay material procurement, and impact overall project success [80, 81]. These effects are reduced by efficient cash flow management.

Assessing the Effect of R^2

Table 7: R-square

	R-square	R-square adjusted
S4-	0.157	0.142

The percentage of variance in one variable that can be accounted for by variance in another is known as the "coefficient of determination," or R^2 [82]. R^2 is a measure of the model's explanatory capacity, also known as the predictive power in the sample, because it takes into account variance explained by each endogenous construct [83]. The strength of each structural path is indicated by the dependent variable's R^2 value, which determines the model's quality [84]. It is also known as in-sample predictive power [85]. Higher R^2 values, which vary from 0 to 1, suggest greater explanatory power [32]. R^2 values of 0.75, 0.50, and 0.25 are considered strong, moderate, and weak, respectively, according to Purwanto et al. [83].

The explanatory power of the model for the dependent variable S4 is examined in Table 7 with special attention paid to the R-squared and adjusted R-squared values. The R-squared value of 0.157 indicates that the independent variables in the model explain approximately 15.7% of the variance in S4-. This suggests a low level of explanatory power, indicating that S4- is most likely influenced by additional variables not considered in the model.

Although the model explains some of the variance in S4-, the inclusion of additional factors may not have significantly increased the model's explanatory power, as evidenced by the slight reduction from the R-squared to the adjusted R-squared. The corrected R-squared value is 0.142, which is slightly less than the R-squared value. For models with multiple independent variables, the adjusted R-squared provides a more accurate measure of the goodness-of-fit by accounting for the number of predictors in the model. These findings imply that there is room for improvement in the model's ability to explain the variance in S4-. Future research may examine additional variables or different model parameters to increase the explanatory power.

Summary

This study examines the causes of late payment problems faced by contractors in Malaysia's construction industry, particularly those involved in private sector projects. Delays often extend beyond 30 days between the interim and final payment stages, making late payment a persistent issue. The study categorizes the primary contributing factors into three groups: human factors, dispute-related issues, and generic causes.

General factors that contribute to payment delays include variation orders that exceed the contract sum, limited financial resources, financial market volatility, post-pandemic recovery issues, and trouble obtaining credit facilities. Contractors frequently bear the financial burden of inflation and rising material costs, as these are not covered under the PAM Form of Contract, 2018.

Disputes and disagreements are also important. Conflicts between consultants and contractors, mistrust of consultants' assessments, disputes over work valuation, and misinterpretations of employers' demands for modifications are typical problems. These disagreements have the potential to worsen, postponing payments and, in extreme situations, putting projects on hold.

Human factors such as cultural norms and contractors' willingness to accept late payments to maintain connections had less of an effect. As noted during tender reviews, contractors especially G7 contractors frequently accept late payments because they believe they are financially stable.

Contribution of the Research

This study enhances both theoretical and practical understanding by providing a detailed analysis of the factors influencing late payments and their consequences. It emphasizes the significance of payment delays as a risk to contractors' cash flow and expands risk management theories by offering mitigation techniques that can be incorporated into project planning. A key recommendation is to implement a Payment Security surety, which requires employers to secure a surety to ensure prompt payment. This approach would lead to a more balanced contractual obligation, safeguarding contractors from financial risks while fostering trust and transparency between parties.

The study also emphasizes how important industry cooperation is. Pertubuhan Arkitek Malaysia should collaborate with groups such as the Construction Industry Development Board (CIDB) and

Pertubuhan Kontraktor Malaysia to standardize the usage of Payment Security Bonds in contracts, guaranteeing prompt payment throughout the sector. To help contractors and project managers better handle payment issues, the study also recommends training programs that teach them financial management, contract negotiation, and dispute resolution.

In practice, this study provides contractors with the ability to promote equitable contract conditions and fair payment procedures. By emphasizing the cascading financial risks that have the potential to collapse entire projects, it also addresses the wider ramifications of late payments, which will disproportionately affect the main and minor contractors.

Conclusion

This study examines the three main causes of late payment problems experienced by main building contractors in Malaysia's private construction industry. It emphasizes that the primary causes are general variables such as post-pandemic recovery, market volatility, financial resource limitations, and increasing expenses not covered by contracts. Payment delays are also significantly worsened by disagreements over valuation, discrepancies, and a lack of confidence among stakeholders. Although they have less influence, human variables including cultural norms and contractors' patience with delays also contribute to the persistence of the problem.

Through the extension of risk management theories and the suggestion of mitigation techniques, the research offers both theoretical and practical contributions. Standardized contractual procedures and industry body collaboration are recommended to provide fair solutions. To properly handle these issues, the incorporation of the Payment Security bond and its related additional clauses in the existing PAM Form of contract, together with the contractors' training in financial management, negotiation, and conflict resolution, is also stressed. By empowering stakeholders to promote equitable practices, this study reduces the financial risks that disproportionately impact main contractors and the sector as a whole.

Acknowledgment

This research was partially funded by Zarqa University.

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