Development of Contract Management Strategy to Control Late Payment in Building Projects

Irwan Yunianto¹, Ayomi Dita Rarasati²
University of Indonesia¹,²
Kampus UI Depok, 16424, Indonesia¹,²
Correspondence Email: mister_irwan@yahoo.com

ABSTRACT

Building projects with private owners have high level of payment issues (late payment, underpayment, or non-payment). The purpose of this study is to develop a risk-based contract management strategy to avoid late payment from private owners to contractors. The research data consisted of literature reviews, questionnaires, and qualitative risk data analyses. The risk analyses identified 10 highest risks as the dominant risk factors from 37 risk variables. The risk response to dominant risk variables was used as a strategy for developing a contract management system. Risks affecting late payment were largely due to contractual clause and contracting clients with less financial capacity due to lack of analysis in the pre-contract phase.

Keywords: Building Project, Contract Management System, Late Payment, Risk Management

INTRODUCTION

Payment problem in construction industries is of importance compared to other industries since duration of construction project are relatively long while the size of construction project and the sum of each progress payment are relatively large. Payments term are usually on credit than payment on delivery. Services are rendered before progress payment is made, and product become fixtures disabling removal (Azman, Dzulkalnine, Hamid, & Bing, 2014). The payment default in construction industries eventually become common. This is because most of construction contract permit non payment for significantly defected works, disputed works and if there is a filed or reasonable third party claim, evidence will be filed (Ansah, 2011; Reeves, 2003).

Payment problems are often generalised as contractors and subcontractors do not get paid their due amount on time. This could be under-payment, late or delayed payment, or non-payment. Non-payments or under-payment refer to situations where an expected payments was never received, and/or would be considered bad debt, written off or lost partially/fully. Late or delayed payment is a situation when payment is not made in time as stipulated in contract timeline (Ramachandra & Rotimi, 2015).

Payment problems should have received greater attention, since they are the main pillars of cash flow and project profits (Liu & Wang, 2008). The timing of payments is a key factor in firm’s profitability performance (Heron & Lie, 2002) as cash is the most important construction company’s resources. The efficient and suitable timed payments is an essential components in ensuring contractor performance (Hasmori, Ismail, & Said, 2012). Late payment could create significant financial losses and lead to bankruptcy. It
is important to understand cash flow forecasting, particularly the factors that cause late payment (Hwee & Tiong, 2002).

Project Management Body of Knowledge (PMBOK) defined project risk as an uncertain event or condition that, if occur, has a positive or negative impact on one or more project objective, such as a scope, schedule, cost and quality (Project Management Institute, 2017). The payment problem will impact better working capital management, cost control, and proper construction project management. From the input and output perspective, payment risk is related to the inhibiting factors for achieving the expected income or contributing to the cost overrun in the project (Mbachu, 2011).

Payment problems have become a global phenomenon. In the United Kingdom, the construction industry has shown an increasing trend in the amount owed to the contractors. Late payments value have doubled from USD 26 billion to USD 50.6 billion during 2008-2012 (Peters, Subar & Martin, 2019). In China, unpaid arrears were more than half of China construction industry’s profit and estimated as 15% of the industry’s total production (Wu & Soo, 2011). In Indonesia, based on a sample from the 2018 financial report from a reputable construction firm, the payment arrear value was about 14.11% of total sales. The study identified that 50.20% of payments arrear comes from private owners. The majority of payment arrears (45.07% of total sales) come from the building project, 42.86% of the building project comes from private owners with the proportion of private contract value of 50.04%.

From the perspective of construction sector, contract management is an integral phase of the procurement life cycle which serves to ensure that the parties involved (contractors and clients) play their respective roles (obligations) to fulfill contractual commitments (operational targets of contract) (Acharya, Lee, & Man, 2006; Barrie & Paulson, 1992). Contract management processes are divided into three stages, including pre-contractual, contractual and post contractual (Van Weele, 2013). On contractor’s perspective, contract management processes are divided into three major key tasks comprising bid preparation, contract signing, and contract implementation & closing (Park & Kim, 2017).

Table 1. Key Task on Contract Management Process

| Bid Preparation Stage | Contract Signing Stage | Contract Implementation& Closing stage |
|-----------------------|------------------------|----------------------------------------|
| • Feasibility study  | • Post tender negotiation | • Claim management                        |
| • Task force team constitution | • LOA Reception | • Reception of progress payment            |
| • ITB (Invitation to Bid) review | • Contract drafting/ signing | • Variation related works                  |
| • Site survey         | • Signing of contract subcontractors | • Other project management tasks          |
| • Query transmission  | • Preparation of construction | • Test on completion & receipt of Taking Over Certificate |
| • Bid preparation & Submission | | • Defect notification Period               |
This study identified previous research on late payment, and updated late payments from a contractor's point of view, particularly in building projects with private owners, by combining with developing a contract management strategy. In contract management, there is a risk distribution to the contracting parties. It protects the contractor from the risk of delays (Hansen, 2015).

The objectives of the study are (1) to identify risk factors of late payments, (2) to identify the dominant risk factor of late payment, and (3) to develop contract management process.

**RESEARCH METHOD**

The risk factors for late payment are obtained from literature studies, validated by experts, and distributed to respondents through a questionnaire. The results were processed and qualitatively analyzed using risk analysis with a probability and impact matrix. The high-risk factors for late payment were chosen as the dominant risk factor. Then, an impact and cause analysis, and risk response analysis were conducted. Preventive and corrective actions from risk response analysis were used as the basis for developing an existing contract management system. Then the results are validated by experts. Figure 1 presents the details.

**RESULTS AND DISCUSSION**

**Risk Factors for Late Payment of Building Projects from Private Owners**

At this stage, risk variables from the literature study were validated by experts. There were 37 risk factors; 33 were obtained from the literature, and 4 were obtained from the interview results (see Table 2).
### Table 2. Risk Factor for Late Payment on Building Project from Private Owners

| No | Variable          | Code | Risk Factor                                                                 | Reference                                                                 |
|----|-------------------|------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------|
| X1 | Pre-Contractual   | X1   | Lack of identification about payment patterns from the previous project     | Andalib, Hoseini, & Gatmiri (2018)                                       |
|    | Phase             |      |                                                                             | Abdulrahman, Kho, & Wang, 2014; Azman et al; Hasmori et al., 2012          |
|    |                   | X2   | Cash flow difficulties due to lack of initial capital                      |                                                                           |
|    |                   | X3   | Short of budget on current years project                                   | Azman et al.                                                              |
|    |                   | X4   | Client financial difficulties to get capital from bank if sales do not hit | Abdulrahman et al, 2014                                                  |
|    |                   | X5   | Contract terms that are burdensome for the contractor                      | Azman et al.                                                              |
|    |                   | X6   | Unclear contract on payment process and time frames                        | Mohamad, Suman, Harun, & Hashim, 2018                                    |
|    |                   | X7   | Lack of identification about macroeconomic conditions                      | Peters, 2019                                                              |
|    |                   | X8   | Clients cash flow problem because of deficiencies in client's management  | Azman et al., 2014                                                       |
|    | Contractual       |      |                                                                             | Hasmori et al., 2012                                                     |
|    | Phase             | X9   | Shortage allocation of fund from sources of funding when contract sum       | Abdulrahman et al., 2014                                                 |
|    |                   | X10  | Contractor's delay in preparing payment documents                          | Azman et al., 2014                                                       |
|    |                   | X11  | Insufficient invoice document submitted by contractor                      | Mohamad et al., 2018                                                     |
|    |                   | X12  | Delay in the consultant's assessment of invoice value                       | Azman et al., 2014                                                       |
|    |                   | X13  | Disagree on the valuation of work done                                     | Azman et al., 2014                                                       |
|    |                   | X14  | Lack of communication to follow up invoicing process                       | Mohamad et al., 2018                                                     |
|    |                   | X15  | Clients deliberate delay for their financial advantages                    | Azman et al., (2012)                                                     |
|    |                   | X16  | Deliberate breach of the contractual terms by owner                        | Hasmori et al., 2012                                                     |
|    |                   | X17  | Technical problems                                                         | Azman et al., 2014                                                       |
|    |                   | X18  | Dispute over quality of works                                              | Azman et al., 2014                                                       |
| No | Variable | Code | Risk Factor | Reference |
|----|----------|------|-------------|-----------|
|    | Variation | X19  | Dispute over the claim | Azman et al., (2014) Ramachandra & Rotimi, (2015) |
|    |          | X20  | Slow process of approving variations | Peters et al., (2019) |
|    |          | X21  | Contractor's error in submitting variations | Reeves, (2003) |
|    | Administration and culture: | X22  | Deliberately delaying payment or willful withholding of payment for personal reasons (including personal gain) | Abdulrahman et al., (2014) |
|    |          | X23  | Perception in the industry that late payments for a few days were acceptable | Azman et al., (2014) Peters et al., (2019) |
|    |          | X24  | The assumption that payment is the absolute right of the owner and accept that payments may be late | Peters et al., (2019) |
|    |          | X25  | Clients assume contractors will finance the project in advance in the event of late payment | Wang, Hadavi, & Krizek, (2006) |
|    |          | X26  | Change in key personnel of project | Peters et al., (2019) |
|    |          | X27  | Lack of communication in project implementation | Azman et al., (2014) |
|    |          | X28  | Conflicts among involved parties | Azman et al., (2014) |
|    |          | X29  | Lack of personnel knowledge and experience | Hasmori et al., (2012) Ramachandra & Rotimi, (2015) |
|    | Post Contractual Phase | X30  | Reluctance to collect late payment to preserve good relationship in order to get repeat order | Interview result |
|    |          | X31  | Late final payment due to late final account | Ramachandra & Rotimi, (2015) |
|    |          | X32  | Retention payments delay due to project close out document delays | Azman et al., (2014) |
|    |          | X33  | Late payment of retention due to repair of defect work which has not been done | Ramachandra & |
At this stage, a questionnaire was sent to respondents who have experienced in payment of building projects. There were 31 respondents consisting of 15 project managers (48.4%), 6 managers/senior managers in the management office (19.3%), and 10 engineering managers/site managers at the project site (32.3%), with a work experience of more than five years. By qualitative risk analysis with probability and impact matrix, there are 10 high risks as the dominant risk factor after validated by experts (see Table 3).

**Table 3. Dominant Risk of Late Payment on Building Projects with Private Owners**

| No. | Code | Dominant Risk Factor                                                                 | Source              |
|-----|------|--------------------------------------------------------------------------------------|---------------------|
| 1   | X2   | Cash Flow difficulties due to lack of initial capital                                 | Owners              |
| 2   | X4   | Client financial difficulties to get capital from bank if sales do not hit the target amount | Owners              |
| 3   | X31  | Late final payment due to late final account                                          | Owners & Contractors|
| 4   | X5   | Burdensome contract terms for the contractors                                          | Owners              |
| 5   | X3   | Short of budget on current years project                                              | Owners              |
| 6   | X15  | Clients deliberate delay for their financial advantages                                | Owners              |
| 7   | X33  | Late payment of retention due to repair of defect work that has not been done          | Owners & Contractors|
| 8   | X6   | Unclear contract on payment process and time frames                                    | Owners              |
| 9   | X8   | Clients cash flow problem because of deficiencies in client’s management capacity      | Owners              |
| 10  | X19  | Dispute over the claim                                                                 | Owners & Contractors|

Based on table 3 above, 70% of the dominant risk factors are caused by the owners; they are their financial and contractual provisions. Besides, 30% of late payment delay
are caused by contractors and owners; they are disputes with owners, delay in payment of retention by owners due to improvements to defects which have not been committed, and the delay in finalizing the final account.

From the dominant risk factors, this study found that the majority of causes occurred in the pre-contract phase, which concerns with the financial capacity of the owner and the existence of an unbalanced contract regulating the rights and obligations of the contracting parties and the payment time frame caused by the contract draft less elaborated and negotiated by the contractors.

**Development of Contract Management System**

At this stage, a structured interview with a questionnaire was carried out with experts to identify the risk impact and causes, followed by a structured interview regarding the identification of risk responses. Risk response consists of preventive action and corrective action. Its development activities were added to the existing contract management process (indicated by the activity in red letters in yellow box in the flow chart. See Figure 2). The results of developing contract management system were validated by experts.

Based on the three major key tasks in the contract management process, there are three procedures on contract management system at PT. X, including project bidding, contract signing, and contract implementation and closing stage.

**Table 4. Development of Contract Management System at Bid Preparation Stage (Bidding Procedure)**

| No. | Risk Response Development Activities                                                                 | PIC          | Procedure |
|-----|-----------------------------------------------------------------------------------------------|--------------|------------|
| 1   | Evaluating the owner's financial capacity (Financial Closing)                                | Finance      | Pre-bid    |
| 2   | Owner reputation assessment                                                                   | Risk Mngt    | Pre-bid    |
| 3   | Make a standardized checklist for the pre-bid decision based on owners’ and contractors’ financial capabilities | Risk Man | Pre-bid |
| 4   | Assistance by a legal / contract administration team during the tender and implementation period | Contract Adm | Pre-bid    |
| 5   | Evaluate the contract according to company's risk appetite criteria, such as legal (right and obligation, dispute mechanism), technical (handover mechanism and retention money), and financial procedure (time frame, fines, penalties, suspension and termination contract on late payment) | Contract Adm | Pre-bid    |
| 6   | Proposed amendment of contract clause according company risk appetite criteria               | Contract Adm | Pre-bid    |
| 7   | Owner payment security from bank or payment from bank                                         | Contract Adm | Pre-bid    |
| 8   | Construction work in stages according to availability of funds                                 | Contract Adm | Pre-bid    |

Table 3 illustrates that the dominant risk factors for late payment, in general, concern with owners’ financial capacity and the existence of an unbalanced contract regulating the rights/obligations of contracting parties and the payment time frame. Owners and
contract draft should be elaborated before making a bid decision. The activity of development needs to be carried out to prevent the risk factor (as shown in Table 4), then added to the existing contract management system. It is indicated with a yellow box and red letter in the flow chart of the bidding procedure (see Figure 2).

The risk response activity developments added in the existing contract management system of pre-bidding procedure regarding the financial capability of the owner are (1) evaluating the owner’s financial capacity/financial closing, (2) assessment regarding owner reputation, (3) standardized checklist development for the pre-bid decision based on owner’s financial capabilities and the capabilities of contractors, (4) owner payment security from bank or payment from bank, and (5) construction work in stages according to the availability of funds. The activity of development regarding the contract clause draft are (1) evaluating the contract according to company’s risk appetite criteria legal (right and obligation, dispute mechanism), technical (mechanism of hand over and retention money payment), and financial (procedure, time frame, fines, penalties, suspension and termination contract on late payment), (2) proposed amendment of contract clause according to the company’s risk appetite criteria, and (3) all activities should be assisted by a legal/contract administration team during the tender and implementation period (see Table 4).
Figure 2. Flow Chart for Bidding Procedure after Development

Table 5. Development of Contract Management System at Contract Signing Phase

| No. | Risk Response Development Activities | PIC | Procedure |
|-----|-------------------------------------|-----|-----------|
| 1   | Ensure changes to the article of the contract to comply with company's risk criteria | Contract Adm | Contract Signing |
| 2   | Ensuring the financial closing of the project or existence of a payment guarantee from the bank | Risk | Contract Signing |
owners issued by bank or payment from / guaranteed by the bank
3 Ensuring the phasing of construction work is under fund availability.

The risk response activity development added in the existing contract signing procedure of contract management system is to ensure that the assessment in the pre-bid procedure is stated in the contract (see Figure 4).

Table 6. Development of Contract Management System at Contract Implementation & Closing Stage

| No. | Risk Response Development Activities                                      | PIC          | Procedure            |
|-----|---------------------------------------------------------------------------|--------------|----------------------|
| 1   | Contract suitability and site actual condition of at certain milestone (e.g., 30%, 60%, 95%) | Operational Div | Contract Implementation |
| 2   | The construction work is carried out in stages according to the availability of fund by age limitation from receivable account | Operational Div | Contract Implementation |
| 3   | Gradual final account preparation by forming team together with owners and consultants to start final accounts after 70% progress | Operational Div | Contract Implementation |
| 4   | Arrange a hold point that the final account must be completed when the progress is 95% -100% | Operational Div | Contract Implementation |
| 5   | Monitor the duration of payment time | Operational Div | Contract Implementation |
| 6   | Fine, suspension or project termination as stipulated in contract about mechanism of dispute | Operational Div | Contract Implementation |
| 7   | Establishing a dispute resolution board at project level | Operational Div | Contract Implementation |

The risk response activity development added in the existing procedure of contract implementation and closing stage are regarding the suitability of contract and actual condition of the site by holding point at certain milestone progress (e.g., 30%, 60%, and 95%), stages of construction according to the availability of funds, payments process and duration, a limitation period of the late payments, approval of final account and holding point to set up final account team and approval of the final account, fine, suspension or project termination as stipulated in contract about mechanism of dispute, and establishing a dispute resolution board (see Figure 3).

This study found that there was a need for assistance by a competent legal / contract administration team during the entire project and an integrative involvement of risk management to assess and provide assistance of project risks. This is necessary as an effort to provide a conflict of interest-free assessment of managerial decisions on the pre-bid stage, contract signing stage, and contract implementation and closing stage.
Figure 3. Flow Chart for Contract Implementation, Addendum and Closing Stage after Development
CONCLUSIONS

Through literature studies, questionnaires, and expert validation, this study highlights 37 risk factors for late payment of building projects with private owners. Then through qualitative risk analysis and validated by experts, there were ten dominant risk factors for late payment. The development of the contract management system was carried out by adding 18 new activities to the existing contract management system, consisting of eight new activities on bidding procedure, 3 new activities on contract signing procedure, and seven new activities on the procedure of implementation and change contract.
REFERENCES

Abdulrahman, H., Kho, M., & Wang, C (2014). Late payment and non payment encountered by contracting firms in a fast developing economy. *Journal of Professional Issues in Engineering and Practice*, 140(2), 04013013.

Acharya, N. K., Lee, Y. D., & Im, H. M. (2006). Conflicting factors in construction projects: Korean perspective. *Journal of Engineering, Construction and Architectural Management*, 13(6).

Andalib, R., Hoseini, A., & Gatmiri, B. (2018). A Stochastic model of cash flow forecasting considering delays in owners’ payment. *Journal of Construction Management and Economic*, 36(10), 545-564.

Ansah, S. (2011). Causes and effects of delayed payments by clients on construction projects in Ghana. *Journal of Construction Project Management and Innovation*, 1(1), 27-45.

Azman, M. N. A., Dzulkalnine, N., Hamid, Z. A., & Bing, K. W. (2014). Payment issue in Malaysian construction industry: Contractors’ perspective. *Jurnal Teknologi (Science & Engineering)*, 70(1), 57-63.

Barrie, D. S., & Paulson, B. C. (1992). *Professional construction management*. New York: McGraw-Hill.

Hasmori, M., Ismail, I., & Said, I. (2012). Issues of late and non-payment among contractors in Malaysia. *Proceedings of the 3rd International Conference on Business and Economic Research*, Bandung-Indonesia, 2-13.

Heron, R., & Lie, E. (2002). Operating performance and the method of payment in takeovers *Journal of Financial and Quantitative Analysis*, 37(1), 37-155.

Hansen, S. (2005). *Manajemen kontrak konstruksi: Pedoman praktis dalam mengelola kontrak konstruksi*. Jakarta: Gramedia Pustaka Utama.

Hwee, N. G., & Tiong, R. L. (2002). Model on cash flow forecasting and risk analysis for contracting firms. *International Journal of Project Management*, 20(5), 351-363.

Liu, S. S., & Wang, C. J. (2008). Resource-constrained construction project scheduling model for profit maximization considering cash flow. *Automation in Construction*, 17(8), 966-974.

Mbachu, J. (2011). Sources of contractor’s payment risk and cash flow problem in the New Zealand construction industry: Project team perception of the risk and mitigation measures. *Journal of Construction Management and Economic*, 29(10), 1027-1041.

Mohamad, N., Suman, A. S., Harun, H., & Hashim, H. (2018). *Mitigating delay and non payment in the Malaysian construction industry*. Paper presented at the IOP Conference Series: Earth and Environmental Science, Volume 117, 3rd International Conference on Research Methodology for Built Environment and Engineering 2017 8–9 November 2017, Shah Alam, Selangor, Malaysia.

Park, S. H., & Kim, Y. S. (2017). An assessment of contract management capabilities for overseas construction project. *KSCE Journal of Civil Engineering*, 22(7), 2147-2158.

Peters, E., Subar, K., & Martin, H. (2019). Late payment and nonpayment within the construction industry: Causes, effect and solution. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 11(3), 04519013.

Project Management Institute. (2017). *A guide to the project management body of knowledge (PMBOK guide)* (6th ed.). Pennsylvania: Project Management Institute, Inc.

Ramachandra, T., & Rotimi, J. O. (2015). Causes of payment problems in the New Zealand construction industry. *Journal of Economic and Building*, 15(1), 43-55.
Reeves, K. (2003). Pay up. JUBM Construction News and Views, 1(4), 4-6.
Wang, D., Hadavi, A., & Krizek, R. J. (2006). Chinese construction firms in reform. Journal Construction Management and Economics, 24(5), 509-519.
Wu, J., Kumaraswamy, M. M., & Soo, G. (2011). Regulative measures addressing payment problems in the construction industry: A calculative understanding of their potential outcomes based on gametic models. Journal of Construction Engineering and Management, 137(8), 566-573.
Van Weele, A (2013). International contracting: Contract management in complex construction project. London: Imperial College Press.