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Research Article

Success and Failure Factors in Refinancing Toll Road with Project-based Sukuk Scheme in Indonesia

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ABSTRACT

This paper identifies and analyses success and failure factors in refinancing toll road projects in Indonesia with project-based Sukuk, based on a survey to select respondents from experts and practitioners. A questionnaire survey to obtain perceptions of toll road project finance by issuing project-based Sukuk, particularly its critical success and failure factors. The results show that variables of: (i) business entity has a good reputation in the pre-construction phase, (ii) completion of the project on time in the construction phase, (iii) revenue target achieved in the operational phase and (iv) commitment and responsibility of the parties (government and business entities) in the transition phase are the top critical success factors. Meanwhile, the top critical failure factors are: (i) behaviour and characteristics of profit-oriented investors in the pre-construction phase, (ii) cost over-run occurs in the construction phase, (iii) failure to make payments to investors in the operational phase and (iv) failure to achieve the target estimated break-even point in the transition phase. Some impacts and consequences are identified and proposed to ease the toll road refinancing with project-based Sukuk. Critical and failure factors provide valuable references for a toll road project-based Sukuk refinancing scheme.

Keywords: Success factors, Failure factors, Project-based Sukuk, Toll Road, Indonesia

INTRODUCTION

Demand for public infrastructure in Indonesia is increasing due to urbanization and economic growth. Infrastructure supports Indonesia's economic development and increases competitiveness to be released from the middle-income trap, and as a reliable formula to uphold public welfare and alleviate poverty (Sihombing, 2018). Zheng et al. (2018) stated that infrastructure is mainly large-scale, and local governments need help to complete financing work independently. The government involves the private sector in infrastructure development because of the need for high initial investment and long-term returns (Khmel and Zhao, 2016). Toll roads are one of the infrastructures that have a crucial role in the transportation sector, especially in supporting economic growth and developing regional potential. However, according to Suseno et al. (2015), toll roads play a strategic role in regional development and are Indonesia's top priority. According to the Indonesian Road Law (2004), toll roads aim to facilitate traffic, improve the distribution of goods and services, support economic growth, reduce the burden on government funds, and encourage equitable development. Toll roads are implemented to increase the efficiency of distribution services, demonstrate economic growth with regional development, spur investment in other sectors and drive economic movement in Indonesia. Transportation infrastructure, especially toll roads, continues to be a priority for the Government of the Republic of Indonesia in producing extensive infrastructure to boost productivity through structural transformation. Hence, the toll roads are national strategic projects determined through presidential regulations and priority projects with a high economic impact as they may expand the regional economy performance and increase the business, economic activities, and social transactions and are part of the transportation infrastructure, essential in increasing national economic growth (Dharmawan, 2012).

Public-private partnerships (PPP) are long-term collaborations between private business entities and the government in the management and financing of toll road infrastructure, with performance-based compensation (Fauzan et al., 2023). Most of the toll road concessions in Indonesia signed by the toll road authority cannot be operated due to financing constraints. On the other hand, the Government is trying to accelerate the development of toll road

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infrastructure to catch up with lagging infrastructure in Indonesia. Project-based Sukuk can be an alternative solution for the following reasons: Project-based Sukuk financing for infrastructure can be done with a long tenor (Ahmed, 2017). Moreover, Sukuk schemes will attract potential investors and financial institutions from abroad to invest in toll roads in Indonesia, and the Sukuk industry has great potential to contribute to infrastructure development in Indonesia (Helmi et al., 2017). Project-based Sukuk schemes are appropriate for infrastructure because the project itself is the main asset for financing, which can be used to finance infrastructure investment (Manzoor et al., 2017). The requirement to use underlying assets gives project-based Sukuk schemes better security for investors. The existence of an underlying asset in a Sukuk makes this instrument a financial investment that is tied to tangible assets. With project-based Sukuk, there will be better risk management between the parties involved in the construction, and the financing model for toll road financing operates by technical aspects (toll road construction) and financial aspects (yield payments, rent, and profit).

LITERATURE REVIEW

Sukuk

Sukuk are Sharia securities used as an alternative for funding purposes of infrastructure development. Sukuk is profit-loss sharing or trading of certain identifiable tangible assets. Sukuk certificates are issued to provide returns to their holders. According to Mohamad et al. (2015), Sukuk are asset-based, while bonds are interest-based. Sukuk allow investors to gain profits from the underlying transaction and are entitled to share profits obtained from Sukuk assets. Meanwhile, conventional bonds are debts that require interest payments to the bondholder under the terms and conditions of the bond. According to Abdelkafi and Bedoui (2016), Sukuk is considered an instrument that may be very efficient in mobilizing resources to finance infrastructure projects. Infrastructure companies and governments that need significant funds for infrastructure development can avoid using debt to mobilize financial resources, but can issue Sukuk as an economic resource. Based on the Sharia principles of profit and risk sharing, Sukuk can offer certain benefits that can overcome various challenges faced by infrastructure financing. According to the National Sharia Board of Indonesia No. 137/DSN-MUI/IX/2020, Sukuk are Sharia securities that reflect ownership of certain assets. The assets that are the basis for the issuance of Sukuk must comply with Sharia principles. Sukuk issuance does not reflect debt, but rather the Sukuk holder's ownership of the asset, and the issuance process has a certain period that can be regulated according to the agreement or applicable regulations. The sukuk issuer must pay income to the sukuk holder through profit sharing or margin and repay the Sukuk funds by the contract scheme at maturity. Further, Sukuk is not debt-based but is a certificate of ownership or capital participation in an asset obtained through a sale and purchase transaction, and the sukuk owner will receive a profit share or margin.

Critical Success Factors

Critical Success Factors (CSF) are important elements requiring management attention to succeed. CSF assists in the development of strategic plans, identification of implementation issues, and monitoring of company performance. According to Sihombing (2018), the critical success factors are as follows:
1. Events that cannot be predicted but carry significant risks
2. Involves the performance of critical individuals
3. It can have a good or bad effect on a company's ability to achieve its goals
4. Involves critical operations, systems, or facilities that require attention to be monitored or subject to contingency plans

Identification of essential factors of success is divided into 4 phases, namely:
1. Pre-construction Phase
2. Construction Phase
3. Operational Phase
4. Transition Phase

According to the literature review, Table 1 explains the critical success factors influencing infrastructure project financing in the pre-construction phase.

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Table 1. CSF in the Pre-construction Phase

No.	Critical Success Factor	References
1	Concession period	Truong *et al.* (2020); Kumar *et al.* (2018)
2	Inflation	Khahro *et al.* (2021)
3	Availability of long-term financing	Delhi and Mahalingam (2017)
4	Government commitment, support, and guarantee	Debela (2019); Hsueh and Chang (2017)
5	The right combination of funding sources	Truong *et al.* (2020); Lasa *et al.* (2015)
6	Preparation of good funding	Truong *et al.* (2020)
7	Transparency in the pre-construction phase	Amovic *et al.* (2020); Kavishe and Chileshe (2018)
8	The business entity's reputation	Osman *et al.* (2019)
9	The strong consortium of business entities	Thomas *et al.* (2012)
10	Adequate financing and attractive funding	Thomas *et al.* (2012)
11	Commitment and quality of sponsors	Kim and Chae (2020); Ameyaw and Chan (2015)
12	Procedure for appointing concessionaires	Debela (2019)

Table 2 describes the factors that influence the success of financing infrastructure projects in the construction phase.

Table 2. CSF in the Construction Phase

No.	Critical Success Factor	References
1	Competitive and transparent procurement with high integrity	Hai *et al.* (2021); Mohammed and Harputlugil (2019); Amovic *et al.* (2020)
2	On-schedule land acquisition	Truong *et al.* (2019); Delhi and Mahalingam (2017)
3	On-time project completion	Delhi and Mahalingam (2017)
4	Project management capabilities	Kim and Chae (2020); Osman *et al.* (2019)
5	System efficiency	Javadin *et al.* (2015)
6	Availability of financing structures and mechanisms for investors	Igboka (2015); Lasa *et al.* (2015)
7	Availability of financial markets and suitable investors	Ismail (2013)

Factors influencing the success of infrastructure project financing at the operational stage are listed in Table 3.

Table 3. CSF in the Operational Phase

No.	Critical Success Factor	References
1	Attractive rate of return	Khahro *et al.* (2021); Lasa *et al.* (2015)
2	Appropriate concession contract	Gupta *et al.* (2013)
3	Stability of the macroeconomic system	Nasucha *et al.* (2019)
4	Good governance	Alteneiji *et al.* (2019); Debela (2019); Osman *et al.* (2019)
5	Attractive yield payment	Selim *et al.* (2019); Abdullah *et al.* (2014)
6	On-time instalment	Sadikot (2012)
7	Revenue target achieved	Truong *et al.* (2019); Hasmawati and Mohamad (2019)
8	Transparency during the operational phase	Amovic *et al.* (2020); Bayilev and Teklu (2016)
9	Commitment and quality of the operator	Kim and Chae (2020)
10	Sufficient net cash in	Gupta *et al.* (2013)

Factors influencing the success of infrastructure project financing at the operational stage are listed in Table 4.

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Table 4. CSF in the Transition Phase

No.	Critical Success Factor	References
1	Return of assets	Jefferies (2006)
2	Transparency in the transition phase	Amovic *et al.* (2020); Kavishe *et al.* (2018)
3	Commitment and responsibility of the parties (government and business entities)	Kim and Chae (2020); Ameyaw and Chan (2015)
4	Operational continuity and lifespan	Amovic *et al.* (2020)

Critical Failure Factors

Besides the success factors, there are failure factors or stories in infrastructure project financing. Identification of Critical Failure Factors (CFF) is also divided into 4 phases, namely:

1. Pre-construction Phase
2. Construction Phase
3. Operational Phase
4. Transition Phase

According to the literature review, Table 5 explains the factors influencing the failure of infrastructure project financing in the pre-construction phase.

Table 5. CFF in the Pre-construction Phase

No.	Critical Failure Factor	References
1	Limited capabilities	Rarasati *et al.* (2014)
2	The expensive transaction costs	Rarasati *et al.* (2014)
3	High cost of funds	Rarasati *et al.* (2014)
4	Higher capital costs	Rarasati *et al.* (2014)
5	Investor's knowledge in Sharia financing	Abdulkareem *et al.* (2021); Osman *et al.* (2019)
6	Limited capacity and lack of experience	Osman *et al.* (2019); Sidlo (2017)
7	Lack of understanding of Sharia financing	Rarasati *et al.* (2019); Osman *et al.* (2019)
8	Behavior and characteristics of profit-oriented investors	Rarasati *et al.* (2019); Osman *et al.* (2019)
9	Understanding risk management	Hasmawati *et al.* (2019); Kociemska (2017)
10	Investor culture	Rarasati *et al.* (2019); Rahim *et al.* (2018)
11	There is no standardization	Chu and Muneeza (2019); Sidlo (2017)
12	The Government's policy of restricting foreign investors	Wibowo and Alfen (2014)

Factors influencing the failure of toll road infrastructure financing at the construction stage are shown in Table 6.

Table 6. CFF in the Construction Phase

No.	Critical Failure Factor	References
1	There is no interest during the construction	Rarasati *et al.* (2014)
2	Inability to finance long-term infrastructure projects	Sidlo (2017)
3	Cost overrun occurs	Khahro *et al.* (2021); Delhi and Mahalingam (2017)
4	The amount of initial costs required	Kumar *et al.* (2018); Lasa *et al.* (2015)

Table 7 explains the factors influencing the failure of infrastructure project financing in the operational phase.

Table 7. CFF in the Operational Phase

No.	`Critical Failure Factor	References
1	Failure to make payments to investors	Hasmawati and Mohamad (2019)

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2	Requires high capital	Nasucha *et al.* (2019)
3	Sharing risks and shared asset ownership	Osman *et al.* (2019)
4	The costs required for operations and maintenance	Khahro *et al.* (2021); Truong *et al.* (2019)

Table 8 explains the factors influencing the failure of infrastructure project financing in the transition phase.

Table 8. CFF in the Transition Phase

No.	Critical Failure Factor	References
1	Failure to achieve the target estimated break-even point	Kim and Chae (2020)
2	The price at the end of the concession period is inappropriate	Kim and Chae (2020)

METHODS

The paper adopts a questionnaire survey to identify the critical factors above. It selects experts and practitioners with a minimum Bachelor's degree and working experience in infrastructure financing as the respondents based on purposive sampling. Capable respondents' opinions and thoughts on their profession or expertise were compiled for this purpose. Participant data that needs to be considered in research is as follows:

1. Information regarding the respondent's profile
2. Work experience in the infrastructure financing sector
3. Educational qualifications
4. Strategic positions and areas of expertise

According to Park (2009), the stages in obtaining CSF can be seen in Figure 1.

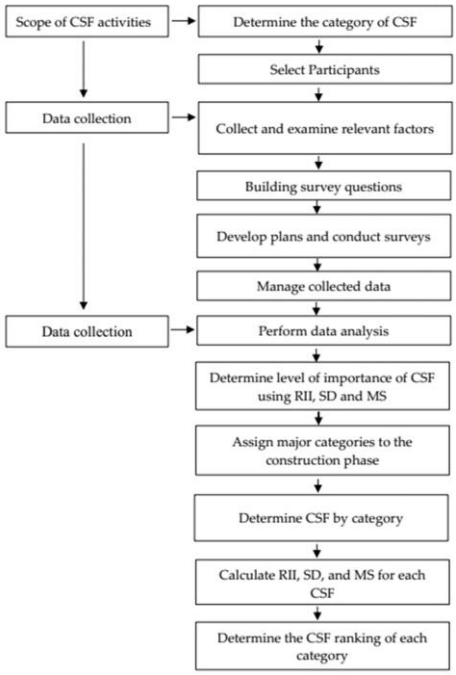

Figure 1: Determination of Ranking

Source: Park (2009) "Whole Life Performance Assessment: Critical Success Factors", Journal of Construction Engineering and Management, Vol. 135, No. 11, p. 3

Each question is answered by using a scale of 1 to 6. Scale 1 states the lowest perceived factor, and scale six states the highest. The explanation of each scale is as follows:

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1. Very unimportant = 1
2. Not important = 2
3. Slightly not important = 3
4. Slightly important = 4
5. Important = 5
6. Very important = 6

Based on data from these respondents, data were analyzed using the Mean Score (MS) and Relative Importance Index (RII) methods to determine CSF and CFF.

$$MS = \frac{(f \times s)}{N} \; (1 \leq MS \leq 6)$$

Where:
s = Score is given to each factor by the respondents, ranging from 1-6
f = Frequency of responses for each rating for each factor
N = The total number of respondents for that factor
The 6-point scale was converted to RII for factor ranking and MS verification.

$$RII = \frac{\text{Total Point score}}{6 \times N} \; (0 \leq RII \leq 1)$$

The total score is calculated from the sum of the factor scores and the six highest scores, using a top-down methodology with RII, SD, and MS parameters. If the RII is the same, the lower SD is considered more important.

RESULTS

Data Analysis

The selected experts from practitioners and researchers were 30 respondents, with 26.67 % from researchers, 13.33 % from governments, 36.67 % from financial institutions, and 23.33 % from toll road business entities. The questionnaire respondents were distributed in years of experience, recent education, and job positions. Participants' experience was 10 % less than 15 years, 73,33 % 15-30 years, and 16.67 % more than 30 years. The recent education of the participants was 6.67 % from a bachelor's degree, 63.33 % from a master's degree, and 30 % from a Ph.D. degree. Job positions of participants were 40 % at the director level, 33.33 % at the general manager level, and 26.26 % at the professor and associate professor levels. Table 9 explains the expert's characteristics.

Table 9. Expert's profiles

Experts Profiles		Frequency	Percentage (%)
Years of experience			
	Less than 15 years	3	10.00
	15 – 30 years	22	73.33
	More than 30 years	5	16.67
Total		30	100
Recent education			
	Bachelor's degree	2	6.67
	Master's degree	19	63.33
	Ph.D. degree	9	30.00
Total		30	100
Job positions			
	Director	12	40.00
	General manager	10	33.33
	Professor/Associate professor	8	26.67
Total		30	100

Critical Success Factors

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Relative Importance Index (RII), standard deviation (SD), and mean score (MS) were calculated for each factor and displayed in the top two rankings at each construction stage. If the RII values of two or more factors are the same, the ranking will be determined based on standard deviation (SD); the lower the SD, the higher the ranking. If the RII, SD, and MS values are the same, the ranking is given the same. Table 11 illustrates the top two RII, SD, and MS rankings.

Table 11. RII values and ranking of the critical success factors

Rank	Critical Success Factors	RII	SD	MS
Pre-construction phase				
1	The business entity's reputation	0.961	0.430	5.767
2	Commitment and quality of sponsors	0.944	0.606	5.667
Construction phase				
1	On-time project completion	0.972	0.461	5.833
2	Competitive and transparent procurement with high integrity	0.939	0.556	5.633
Operational phase				
1	Revenue target achieved	0.978	0.434	5.867
2	Attractive rate of return	0.972	0.461	5.833
Transition phase				
1	Commitment and responsibility of the parties (government and business entities)	0.933	0.563	5.600
2	Transparency in the transition phase	0.917	0.630	5.500

The results indicate two success factors in the pre-construction phase, namely: "the business entity reputation" and "commitment and quality of sponsors." In the construction phase, "on-time project completion" and "competitive and transparent procurement with high integrity " were the results. Meanwhile, in the operational phase, the "revenue target was achieved", and the "attractive rate of return" was the result. In the transition phase, "commitment and responsibility of the parties (government and business entities)" and "transparency in the transition phase" were the results.

Critical Failure Factors

Relative importance index (RII), standard deviation (SD), and mean score (MS) were calculated for each factor and displayed in the top two ranks at each construction stage. If the RII values are the same, the factor with the lower SD is ranked higher. If RII and SD are also the same, the higher MS value determines the ranking. Factors with the same RII, SD, and MS were ranked equally. Table 12 illustrates the top two RII, SD, and MS rankings.

Table 12. RII values and ranking of the critical failure factors

Rank	Critical Failure Factors	RII	SD	MS
Pre-construction phase				
1	Behavior and characteristics of profit-oriented investors	0.900	1.037	5.400
2	Investor culture	0.811	1.408	4.867
Construction phase				
1	Cost overrun occurs	0.878	1.081	5.267
2	Inability to finance long-term infrastructure projects	0.533	2.140	3.200
Operational phase				
1	Failure to make payments to investors	0.950	0.750	5.700
2	The costs required for operations and maintenance	0.750	1.697	4.500
Transition phase				
1	Failure to achieve the target estimated break-even point	0.900	0.932	5.400
2	The price at the end of the concession period is inappropriate	0.583	2.080	3.500

The results indicate that two failure factors in the pre-construction phase were "behavior and characteristics of profit-oriented investors" and "investor culture." In the construction phase, "cost overrun occurs" and "inability to finance

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long-term infrastructure projects." In the operational phase, "failure to make payments to investors" and "the costs required for operations and maintenance." In the transition phase, "failure to achieve the target estimated break-even point (BEP)" and "the price at the time of the concession period is inappropriate."

DISCUSSIONS

Business entity's reputation

Business entity's reputation is the stakeholder's perception of the company's capabilities, based on its past conditions and prospects. For investors, financial reports and the financial performance of toll road companies are very important. Osman (2019) alludes that reputation is based on perceptions of an organization's reliability, credibility, and trustworthiness. Reputation is perceived as a value judgment about a company's attributes, and apparently. An investment company with a high reputation and good image will convince an individual to participate in the investment. Reputable organizations will derive customer satisfaction and, in turn, will lead to an individual's behavioral intention (Wu and Wu, 2014). Investors believe that Special Purpose Vehicle (SPV) shareholders, with high creditworthiness and reliability, would firmly commit to a project (Zhu and Chua, 2018).

On-time project completion

On-time project completion is completing the project on time according to the target. Delayed completion of the project and lack of time management will increase many resources, especially project costs and human resources. Delays in completing toll road infrastructure projects will impact operational targets and investment revenue. Delhi and Mahalingam (2017) a business entity's reputation reflects stakeholders' perceptions of the company, with financial reports and financial performance important to investors. Ghaleh *et al.* (2021) stated that additional time beyond the plan has a negative impact on project costs, quality and schedule. Successful completion of the project is essential.

Revenue target achieved

Revenue targets achieved for investors are significant. Investment risks need to be taken seriously by investors who want to invest their capital in the toll road operation business because it will directly affect the level of profit that may be obtained. According to Truong *et al.* (2019), Toll revenues depend on tariffs, traffic volume and traffic growth, which is influenced by the development of feeder roads and industrial areas. Proper rate structure and regular adjustments ensure revenue flow. Kumar *et al.* (2018) stated that revenue is calculated from AADT and toll rates after construction is completed, with traffic growth as a crucial but high-risk parameter.

Commitment and responsibility of the parties (government and business entities)

Commitment is the dedication of the main actor in the project (Ameyaw and Chan, 2015). Commitment is an agreement or attachment to carry out something or a contract, and it is demonstrated by seriousness and a high sense of responsibility in implementing the agreed contract (Ismail, 2013). Commitment from both parties, both the public and private sectors, is important to achieve infrastructure project objectives by ensuring the best allocation of resources. Kim and Chae (2020) state that the commitment of construction managers as business entities aims to ensure construction is on time, on budget and quality to produce goods, services and investment. The government can provide guarantees for private participants regarding profits and the protection of rights.

Behaviour and characteristics of profit-oriented investors

In the Sharia concept, investment does not only focus on material benefits resulting from economic activities, but is also influenced by other factors that support Sharia values. Osman (2019) argues that behaviour value is illustrated to significantly impact the behavioural intention toward investment in Sharia financing. Dominant factors are a person's driving force in carrying out investment activities, such as social motives that help some people who do not have capital, and there is an implementation of the zakat mechanism for the amount and asset value. Rarasati (2019) states that rejection of Sharia finance can influence the implementation of financing in infrastructure projects. The profit-oriented attitude of investors is also an obstacle, coupled with the varying levels of understanding of stakeholders regarding the concept and its implementation.

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Cost overrun occurs

Cost overrun is an event where work that has been calculated experiences additional costs beyond the work that has been calculated costs. This event significantly affects the continuity of a construction project. Truong *et al.* (2019) state that cost overruns negatively affect financial sustainability, and project owners mainly find the source of funds to cover the cost overrun. Delhi and Mahalingam (2017) emphasize the importance of measuring the success of a PPP project holistically throughout its life cycle, not just from construction cost performance. If costs increase, the SPV must renegotiate with the funder to continue the project. These negotiations can affect the project's ex-post efficiency and the SPV's ex-ante moral hazard. However, significant losses due to renegotiation can prevent moral hazard in the SPV (Shi *et al.*, 2018). Mahani *et al.* (2018) explain that pricy construction costs, pricy land acquisition costs, or both cause high investment costs. Then, high construction costs are usually caused by the difficulty of construction, which requires many bridges, tunnels, or other elevated structures.

Failure to make payments to investors

Failure to make payments to investors is a risk in investing. However, if the issuer's negligence causes this factor, this is a form of broken promise. Hasmawati and Mohamad (2019) state that the failure of developers to fulfil their obligations on time is caused by the possibility of assets not being delivered, projects being abandoned, or assets not meeting specifications. Inaccurate traffic estimates (Regan et al., 2017) and low volume and user capacity (Mahani et al., 2018) are the causes of low transportation project revenues, failure to meet operational costs and debt obligations.

Failure to achieve the target estimated break-even point

Failure to achieve the target estimated break-even point means failure to reach a point of no loss and profit or return on investment. BEP occurs when the profit obtained is equivalent to that required in a business, or can be called without experiencing a loss. In this position, profit is worth zero. According to Truong et al. (2019), Low traffic demand and toll rates impact the breakeven point of toll road projects, with regional economic development needed to increase traffic volumes and operational ratios. Tolls can be used to recover operating expenses and recover debt.

CONCLUSION

The present research shows the importance of the success and failure factors in refinancing toll roads through the project-based Sukuk scheme in Indonesia. Generally, the result indicates that all success and failure factors were rated in each phase of the toll road project. The overall results show that "The business entity has a good reputation in the pre-construction phase," "completion of the project on time in the construction phase," "revenue target achieved in the operational phase," "commitment and responsibility of the parties (government and business entities) in the transition phase" were the top critical success factors of refinancing toll road project by Sukuk infrastructure project-based in Indonesia. Meanwhile, the top essential factors of failure in refinancing the toll road project by Sukuk project based in Indonesia were "behaviour and characteristics of profit-oriented investors in the pre-construction phase," "cost over-run occurs in the construction phase," "failure to make payments to investors in the operational phase," "failure to achieve the target estimated break-even point (BEP) in the transition phase."

This study reviews and identifies success and failure factors in issuing project-based Sukuk for continuing toll road financing. The identified CSF and CFF provide a valuable reference for the toll road business entity and the Government to prepare a refinancing scheme, and the revealed CSF and CFF are beneficial for toll road stakeholders. This paper can help future research on toll road project finance using appropriate methods and analysis.

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