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BANK PERSPECTIVE OF SLOAR PV POWER (PLTS) PROJECT BANKABILITY IN INDONESIA

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Abstract. Lack of bankability project becomes one of the major concerns in the slow development of renewable energy in Indonesia. As of October 2019, there are 27 Power Purchase Agreements (PPAs) that have not reached financial close and 5 projects have been terminated out of 75 PPAs signed between 2017 – 2018. Despite being the most abundant renewable energy source in Indonesia, there are only 152 MW Solar PV[1] powerplant (PLTS) installed or about 0.028% of the total potential. This study aims to understand how the commercial bank's perspective on Solar PV project bankability is influenced by several bankability criteria. In this research, there are five classifications of bankability criteria which are strength of sponsor, political and legal environment, project's financial strength, transaction characteristic, and mitigation and security package. The survey is distributed to the commercial banks that ranked in the top 35 based on its total capital which covers banks with BUKU 4, 3, and 2. The result indicates that how the banks perceived Solar PV project bankability is influenced by their perception of the project's financial strength and transaction characteristic criteria. This describes that the focus of the commercial banks in determining project bankability is the success in developing and operating the project to meet its financial obligation.

Keywords: Project Bankability, Commercial Bank, Solar PV Project, Strength of Sponsor, Political and Legal Environment, Project's Financial Strength, Transaction Characteristic, Mitigation and Security Package

1 Introduction

Global warming or cimate change has become the current world issue. This warming phenomenon was caused by greenhause gases (GHG) that have been raising due to the human activities that produce two-thirds of GHGs which is carbon dioxide (CO_2) [1]. In Indonesia's primary energy consumption, oil has become the biggest energy source that contributes about 970 TWh, followed by coal that contributed about 715 TWh and natural gas that contributed about 389 TWh in 2018 [2]. This is not a small number especially if it considering the emission that produced from that consumption. With the concern of GHG emission and the depletion of fossil fuel, energy alternative is needed. These problems are encouraging the Indonesia government to increase the utilization of renewable energy as alternative energy. In Government Regulation No. 79 of 2014 on National Policy, Indonesia put a target for new and renewable energy share in the primary energy mix of at least 23% by 2025 and 31% by 2050. Indonesia also already committed to the Paris Agreement to cut emissions by 29% by 2030 [3]. In

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[1] Photovoltaic

developing renewable energy, Indonesia has a very big potential for renewable energy resources. As a country that located in the equator, Indonesia has a high potential for solar PV energy at 532.6 GW. By 2030, Solar PV energy is expected to have a significant contribution in utility-scale plants, on residential and commercial rooftops, and in off-grid settings for remote areas electrification or to displace diesel-powered generation [4]. However, the development of solar PV energy in Indonesia still considered slow. In project finance, the high financing cost is the challenge for renewable energy projects in Indonesia which typically have a long-term Power Purchase Agreement (PPA) that made with PLN (State-owned utility). In financing a project, besides investors, the bank also plays an important role in providing loans in funding a PPA. However, renewable energy projects in Indonesia still cannot access these funds because of the lack of bankable projects [4], [5].

The bankable project is indicating the good quality of the project that the lenders likely to finance with consideration of its related risk and returns [6], and in this research, the lender is the bank. As of October 2019, there are 27 PPAs that have not reach financial close and 5 projects have been terminated out of 75 PPAs signed between 2017 – 2018 [7]. The role of the bank in providing debt facility to solar PV projects is important since the bank is the primary source of loan capital [8]–[10]. Debt-based financing with a bank loan is the traditional way to fund a long-term project which the characteristic of solar PV project [10]. The problem is that solar PV power generation projects often have an issue in the funding especially in getting credit from the bank. According to Agustinus [11], many IPP cannot get any funding because their project is not yet fulfilling the criteria from the bank. The project that not bankable might have issues in this matter that lead this research to study the perspective of the bank in determining the bankability of solar PV projects in Indonesia.

2 Literature Review

2.1 Project Bankability according to Commercial Bank

In general, bankability is a term of the willingness of lenders to finance a project that based on the project assessment (to assure the project objective will be met) and consideration of its risks and returns [12]–[14]. So, before the borrower or project developer can get the money, there are some assessments that provided by the lender. The lender side in this research will be focused on the commercial bank. These assessments need to be conducted by the bank in order to be aware of the borrower, project, and its environment to decide its bankability.

Basel Committee's Rating Criteria
Basel Committee on Banking Supervision (BCBS) is an institution who set the primary global standard of banks regulation [15]. To support banks and their supervisor in managing credit risk, the Basel Committee is issuing a document that set out the principles that should be used in evaluating a bank's credit risk management system. These principles will be the standard for every bank in managing their credit risk exposure [16]. Depending on the credit type, these are the criteria that serve as the basis for rating a credit within bank's internal rating system [16]:
- The credit purpose and its source of repayment
- The current risk of the borrower
- The current risk of the collateral and its sensitivity to economic and market changes

- The borrower's repayment track record and capacity to meet the obligation (based on historical financial trends and cash flow projection under various scenarios)
- The borrower's business expertise, status, and position wihtin respected industry
- Credit's proposed terms and conditions that limit the change of the borrower's risk profile in the future
- Adequacy and feasibile collateral or guarantee (under variaous scenarios)

2.2 Bankability Factors

The classification of the project bankability criteria was done by reviewing and understanding each criteria and match it with appropriate classification based on Gatti's [17] book about 'Project Finance Theory and Practice'. According to Gatti's [17] book, it proposed five classifications: Strength of sponsor, Political and legal environment, Financial strength of the project, Transaction characteristic of the project, Mitigation and security package.

Strength of sponsors can be defined as the soundness of sponsors to meet the obligation that can be analyze from the sponsor's track records (especially in the similar transactions), sponsor's financial strength and experience within the sector (in this research, the sector is solar PV power), their invested and available capital. In this criteria, the sponsor is defined not limited to the main sponsor but also any shareholder of the project or special purpose vehicle (SPV) [17]. Political and legal environment can be defined as the existing legislation within project's country that have an impact on the borrower's rights. In grading this criterion, several risks should be considered such as political risk, transfer risk, risk of force majeure, and the stability of the legal and regulatory system.

Financial strength can be defined as factors that affecting the project financial stability such as market and financial conditions. Market conditions refer to external factors like competitiveness and uniqueness within the sector. Financial conditions refer to internal factors such as the level of cover ratios, the degree of financial leverage utilized, the project duration to tenor of the loan ratio, the amortization schedule, scenario analysis, and the admittance that force sponsors to build a debt reserves [17]. transaction characteristic can be defined as the characteristic in the mean of the industrial and operational features of the project. Features that need to be considered in grading this criterion are the technological and planning risk, the construction risk paired with the track record, financial strength, and the completion guarantees from the contractor, operation and maintenance contract paired with experience of the operator, offtake agreement, and the supply risk [17]. mitigation and security package can be defined as the package that secure the transaction in term of repayment to the lender. In grading this criterion, factors that need to be considered are the provision and the fund availability of the project developer or SPV to meet the obligation, adequate guarantees and mortgages, lender's degree of control towards SPV's cash flow by means of escrow accounts, proper credit agreement [17].

This classification was chosen in this research because it is based on the criteria that provided by the Basel Committee's final document that published in June 2004 and each classification able to cover the indicators that reviewed and it also contain the basic theory of credit granting (Five C's of Credit and Basel Committee's Credit Rating Principles). Since each classification is covering certain area within the solar PV project bankability decision process, this research proposed five variables that affecting the project bankability decision by commercial banks in Indonesia. From a critical literature review, it identified with total criteria of 53 which 10 criteria measuring Project Bankability endogenous variable and the rest of 43 criteria measuring five criteria classification as the exogenous variable. The identified

bankability criteria dimension can be seen in the **Table 4**. The conceptual framework and hypothesis development of this research is shown in the following figure.
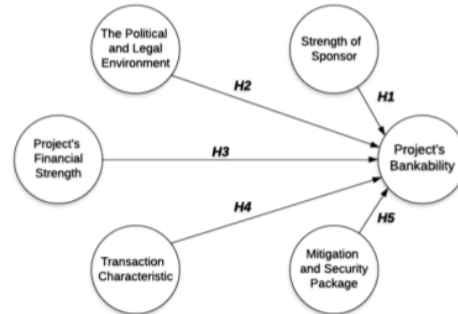

Figure 1. Conceptual Framework

Hypothesis 1 – *Strength of Sponsor have a positive influence towards Project's Bankability.*
Hypothesis 2 – *Political and Legal Environment have a positive influence towards Project's Bankability.*
Hypothesis 3 – *Financial Strength have a positive influence towards Project's Bankability.*
Hypothesis 4 - *Transaction Characteristic have a positive influence towards Project's Bankability.*
Hypothesis 5 - *Mitigation and Security Package have a positive influence towards Project's Bankability.*

3   Research Methodology

3.1   Data Collection and Presentation

In this research, the critical criteria that determine the bankability of solar Photovoltaic (PV) project based on the commercial bank perspective in Indonesia will be identified and analyzed. According to Sekaran & Bougie [18], this research is considered a descriptive study where the objective is to obtain data that describes the topic of interest. From all discovered solar PV project bankability criteria from literature reviews, the commercial bank's credit granting team will be asked to determine the level of significance of each criterion. The unit of analysis in this research is the commercial banks in Indonesia. In this research, the commercial banks will be chosen based on their total assets which represent their market share in Indonesia. It will be not considering the origin of the bank, whether it is a local or foreign bank. The selection method is conducted in order to have data that represent the commercial banks in Indonesia. Since the objective of this research is to analyze the perspective of the commercial bank towards solar PV project bankability, the commercial banks should be filtered based on its experience in project lending in the renewable energy sector, especially in solar energy in order to have more reliable findings. However, it not filtered in order to collect more data and to be able to analyze the experiences of Indonesian commercial banks in project lending.

Both primary and secondary data will be used in this research. The primary data is coming from the survey data from the commercial banks. The secondary data is the total assets of the top 35 commercial banks in Indonesia to determine the market share for sample size

determination. The primary data will be collected through a survey in the form of the questioner. The questioner distribution will be done through both email and hardcopy of questioner to 35 commercial banks. The questioner is need to be filled by at least three respondents. The top position from the credit-granting team is recommended to become the respondent. The secondary data is the total assets of 35 commercial banks that collected from the website. The questioner that distributed to respondents is using Likert scale questions. The purpose of Likert scale construction is to understand the perceptions or agreement of the participant towards the investigating variable by addressing a hypothetical statement related to the specific phenomenon [19]. So, this scale is suitable to measure the ordinal scale data that suitable with this research objective which to identify the critical criteria in determining solar PV project bankability based on the commercial bank's perspective in Indonesia. The population is the commercial banks in Indonesia. For the sample target, the commercial banks will be chosen based on their market share according to total assets in Indonesia. From those 35 commercial banks, there were three bank categories which divided based on its core bank capital according to OJK (Financial Service Authority). There are 6 banks in BUKU 4, 17 banks in BUKU 3, and 12 banks in BUKU 2 that listed.

The total sample of 26 respondent data are being analyzed. These samples are obtained from the total of 35 commercial banks that asked for at least 3 respondents per bank (105 total respondents). So, 26 respondents from 105 or it is about 24.76 % the proposed questioner were answered. It is a small sample size, but this sample size is acceptable with several considerations. First, this sample size is enough to cover the market share based on the total assets. According to the top 35 commercial bank's market shares, it can be seen that banks from BUKU 4 and 3 combined have about 97.66% of the market share from the top 35 with total of 23 banks, since the survey was distributed to all those 35 banks. Second, small population. Currently, based on the Financial Services Authority's Report, there were 96 commercial banks in Indonesia per December 2019 [20]. From the sample, it already covered 72.22% of BUKU 4 population, 16% of BUKU 3 population, and 0.64% of BUKU 2 population **Table 5**. The observed samples are considered adequate since BUKU 4 and 3 are takes the majority of the market shares and represent the commercial banks preferences in Indonesia. Third, data collection situation. The timing of the data collection of this research is exactly same with the peak of the COVID19 in Indonesia which makes very challenging to get response from the contacted the bank's office and to ensure the questioner reach the appropriate person or division.

3.2 Partial Least Square Structural Equation Model (PLS-SEM)

To evaluate the research model construct, Partial Least Square Structural Equation Model (PLS-SEM) method is adopted. PLS-SEM is a variance-based partial least squares technique and appropriate for prediction and theory development researches [21]–[23]. In calculating variance-based structural equation models, PLS-SEM is a common multivariate analysis method [24]. The other advantages in adopting this method are it work efficiently with small sample size with complex model and less restrictive assumptions about the data [21], [22].

In PLS-SEM assessment, there two separate model evaluation [21]. First, model measurement evaluation. The validity and reliability of the model will be examined. This evaluation is done to make sure the measurement of the data is valid and reliable [22]. Second, model structural evaluation. The structural model estimates such as the stability of the structure will be examined. Model structural evaluation is associated with the Inner model evaluation [22]. This evaluation examine the coeficient of determination (R^2), path coefficients (β) estimation, effect size (f^2), predictive relevance of the model (Q^2), and goodness-of-fit (GOF) index. In the path coefficients (β) estimation, the hypothesis testing will be done in this

evaluation. Therefore, null and alternate hypothesis were proposed. Null Hypothesis (H_0) – The variable does not have any influence towards Project's Bankability and Alternate Hypothesis (H_a) – The variable does have any influence towards Project's Bankability.

3.3 Bankability Criteria Ranking

The rank of bankability criteria is based on the rating of significance or importance according to the commercial bank's perspective. This ranking was done in order to support the analysis and could describe the perspective more. To rank each criterion, the Relative Importance Index (RII) ranking method is adopted. the RII ranking method is done by giving a weight value to each rating (1 to 5) and calculate it to have relative importance index. The formula can be seen in the following formula:

$$RII = \frac{\sum W}{(A \times N)} \tag{1}$$

Where W is the weight value of each rating, A is the highest weight value, and N is the total number of respondents. In this research, the weight value of each rating will be given:

Table 1. Likert scale rating and weight value

Scale	1	2	3	4	5
Rating	Not Significant	Slightly Significant	Moderately significant	Significant	Extremely Significant
Weightage	0	25	50	75	100

With this method, each criterion's relative importance index can be determined and it's ordered from the highest value to the lowest to determine the criterion ranking. The result of this analysis will also be the ranking of solar PV project bankability criteria according to the commercial banks in Indonesia and the commercial banks of BUKU 4, 3, and 2.

4 Result and Discussion

4.1 Hypothesis Testing

The result of the model evaluation can be seen in the following table.

Table 2. PLS-SEM model evaluation result

Model Evalutaion	Threshold	Values
Model Measurement Evaluation		
Factor Loadings	>0.7	>0.7
Composite Reliability	>0.6	>0.7
Average Variance Extracted (AVE)	>0.5	>0.6
Fornell-Lacker criterion test	*Variable correlation to its own should be the highest*	√
Cross-Loadings	*Variable correlation to its own should be the highest*	√
Model Structural Evaluation		
The Coefficient of Determination (R^2)	>0.75	0.765
Predictive Relevance (Q^2)	>0	0.425
Goodness-of-Fit index	>0.36	0.725

From the model evaluation, according to the reliability and validity tests that fulfill the standard or 'cut-off' value, the reliability and the validity of the measurement model is confirmed. Accroding to the model structural evaluation, the model has an appropriate coeficient of determination (R^2), predictive relevance (Q^2), and the model fit (GOF). The hypothesis testing was analyzed according to the analysis of the path coefficient (β) which can be seen in **Table 6**. From the test, with the standard significance of 0.1 or 10%, it shown that only H3 ($\beta = 0.246$, T = 1.458, pstd. = 0.074) and H4 ($\beta = 0.461$, T = 2.268, pstd. = 0.012) that have enough evidence to accept the alternate hypothesis. To conclude the testing result, from five proposed Solar PV project bankability criteria, Project's financial strength and Transaction characteristic criteria classification have a direct influence towards the project's bankability determination in the commercial banks' perspective.

Financial Strength (FS) criteria have direct influence towards Project Bankability because this criterion are directly affecting the quality of the project, which directly related to the interest of the banks in loan transaction [14]. Project with stronger financial strength criteria will able to repay its financial obligation and can sustain the project in the longer period of time especially when it compared with the credit duration. In this case, it directly fulfills the bank interest in loan transaction and increase the project bankability. Project that have a weak financial strength will likely to not able to repay the debt which will decrease the bankability of the project directly. Transaction Characteristic (TC) criteria also have direct influence towards Project Bankability because this criterion are directly affecting the quality of the project in the technical and operational matter [14]. Project with better transaction characteristic will able to develop successfully and can be sustain in the longer period of time which directly affecting the repayment capability of the project. In this case, it directly fulfills the banks interest in loan transaction and increase the project bankability. Project with weak transaction characteristic criteria will likely to not complete the construction phase and when they can continue to the operational stage, it will have a higher possibility to not sustain in the long period of time.

H1 (Strength of sponsor (SS)), H2 (Political and legal environment (PE)), and H5 (Mitigation and security package (MP)) that rejected the alternate hypothesis indicates indirect infuence towards the project's bankability determination in the commercial banks' perspective. Strength of Sponsor criteria have indirect influence because banks considering this criterion to ensure the project's sponsor could protect the bank interests. Banks want to ensure the shareholders have sufficient experience, good financial standing, technical and operational capabilities to implement the project successfully [14]. In addition, the credibility of the sponsor cannot improve the quality of the project. For example, a project that not bankable cannot become project that become bankable by only developed by a credible sponsor. However, a credible sponsor is more favorable for banks because they will likely to develop more successful project and protecting the bank's interests. Political and Legal Environment criteria have indirect influence in the way of affecting the desirability of the project. More appropriate political and legal environment cannot improve the quality of the project. However, it could increase the desirability of the project for banks to finance. In addition, both banks and developer cannot change this criterion to become more favorable for them and they can only dependent only to the Government. Mitigation and Security criteria have indirect influence because the main purpose of this criterion is to secure the loan transaction especially before and after the risk occurred. This criterion considered important for banks before the risk in the way to mitigate the potential risks and after the risk to reduce the potential losses. In this case, banks cannot rely on collateral only as the source of repayment. In addition, with bigger collateral value cannot improve the quality of the project. For example, a project the not bankable cannot become project that become bankable by only covered with big collateral value. However, a big

collateral value is more favorable for banks because it could cover the risk of collateral value changes over time.

4.3 Bankability Criteria Ranking

Table 3. Top 10 bankability criteria ranking

Classification	Criteria	Rank
TC	Construction delay risk	1
TC	Quality of offtake agreement (PPA)	2
FC	Project's profitability	3
TC	Off taker track record	4
MP	Lender's control in Escrow account	4
FS	Amortization schedule	6
MP	Transferability clause of the credit agreement	7
FS	Duration of the project compared to the duration of the credit	8
PE	Enforceability of the government's contracts and guarantees	10
MP	Government's guarantee	10

Each criteria are ranked which can be seen in **Table 9** If it observed from the top ten the most significant in determining the Solar PV project bankability in the commercial bank's perspective (**Table 3**), most of it came from the project's financial strength and transaction characteristic criteria classifcation. In the transaction characteristic criteria, construction delay risk criteria ranked first describes the concern of the banks in reliability and credibility of the contractor which describe the possibility of the project to fail in the construction phase and cannot continue to the operational phase. Quality of offtake agreement (PPA) (2nd) and track record (4th) describes the concern towards the reliability of the offtaker to ensure the operation of the power plant. In the project's financial strength criteria, project's profitability (3rd) and amortization schedule (6th) become the concern since it directly influence the repayment of the loan. Since Solar PV project is considered long term project, duration of the project compared to the duration of the credit is concerned by the bank to ensure the credit will be paid before the usefull life of the project.

Although the other criteria classifications (SS, PE, MP) have an indirect influence, it still considered important in project lending in the perspective of bank which can be observed from the criteria ranking. For mitigation and security package criteria, lender's control in escrow account (4th) and transaferability clause (7th) are important to reduce the risk especially before and after the risk occured. In political and legal environment, the enforceability of the government's contract and guarantees are become the consideration when bank want to faciltating a credit to Solar PV project. Therefore, the availability of the government's guarantee could increase the desireability of the project. The importance of each criteria also can be seen in the **Figure 2**.

The degree of significance are scored based on its average value (Likert scale in **Table 1**) and shows the difference between banks from BUKU 4 and 3 perspective. The difference also supported with mean comparison (One-way ANOVA) which shows the perspective difference on the project's financial strength criteria between BUKU 4 and 3. banks with BUKU 4 perceived project's financial strength criteria more significant than transaction characteristic criteria and banks with BUKU 3 perceived both criteria the same. Banks with BUKU 4 which have bigger asset and stronger financial capability will be more resilience or able to take a higher risk credit agreement like Solar PV project. Banks with BUKU 3 will definitely more careful in facilitate a credit to this kind of project that generally perceived have a high-risk level which explain why BUKU 3 perceived project's financial strength criteria less significant than banks

with BUKU 4. Also, according to Kennedy [25], states financial institutions tend to be willing to accept a higher level of risk credit agreement with the objective for social and environment where many huge state banks are categorized as BUKU 4 bank.
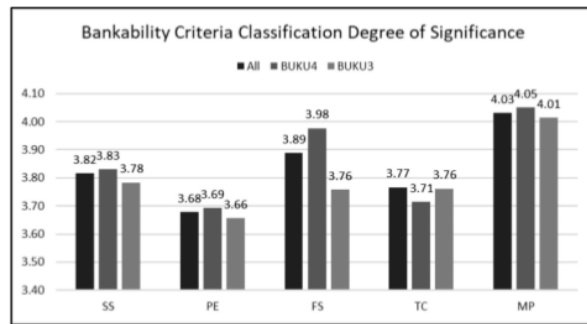

Figure 2. Bankability criteria classification degree of significance

5 Conclusion

This study aimed to identify the degree of influence of the perspective of several bankability criteria towards the perspective of Solar PV power project bankability according to commercial banks in Indonesia. The project bankability criteria are classified into five such as Strength of Sponsor, Political and Legal Environment, Project's Financial Strength, Transaction Characteristic, and Mitigation and Security Package. The perception of banks on the project's financial strength and transaction characteristic criteria have direct influence towards the perception on project bankability. The variability of the banks in perceived those criteria might occurred because of the difference in the bank's financial capability (between BUKUs) and the state or private owned banks.

The perception of banks on the strength of sponsor, mitigation and security package, and political and legal environment criteria are statistically having indirect influence towards the perception on project bankability because banks are perceived those criteria the same. However, those criteria are considered important in determining project bankability according to banks since it support the successfulness of the project which related to project's financial strength and transaction characteristic criteria. The perspective difference between banks with BUKU 4 and 3 also can be observed from the comparison. It concluded that commercial banks with smaller total assets or weaker financial capability likely to perceive Solar PV project more risky than the banks that have a bigger total asset which can be observed from the tendency of the banks with BUKU 3 that more concern to the Mitigation and security package and Political and legal environment criteria.

From this study, it provides an insight of the degree of importance of each project bankability criteria according to the commercial banks' perspective which can be adopted by Solar PV or any Renewable Energy project's stakeholder in order to achieve more bankable project. It recommended to focused more into Transaction Characteristic and Financial Strength criteria of the project. Also secure the project transaction by preparing Standby Equity or supported by strong financial capability sponsor and any Mitigation and Security packages if want to be

considered more bankable by commercial banks in the current Political and Legal environment of Indonesia. It recommended to proposed the credit agreement to the bank that have a strong financial capability such as banks with BUKU 4 especially state-owned bank. Because a stronger financial capability of the banks has more resilience towards a higher level of risk credit such as Solar PV project.

Although the objective have been achieved, this study still have a limitation and have a room for improvement. To have more favorable result where more identified criteria can be extracted, bigger sample size is needed. With bigger sample size, reliable and valid model construct that contain more identified criteria can be achieved and would provide more information about the effect of those criteria. It also could further enhance the result of this current research. Since in this study only top 35 commercial banks that targeted as the respondents and it only from BUKU 4, 3, and 2, bigger sample size collection should be conducted by approaching more broader bank sample like banks with BUKU 1 to offer further validation about the commercial bank's exposure towards Solar PV project in Indonesia.

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Appendix

Table 4. Identified bankability criteria dimension for solar PV project

Component	Bankability criteria dimension	References									
		1	2	3	4	5	6	7	8	9	10
En. Var	**Project Bankability**										
Dim 1	Source of repayment, demand risk, and capacity to repay			√		√					
Dim 2	Supply risk				√	√					
Dim 3	O&M risk					√	√				
Dim 4	Construction and completion risk				√	√	√				
Dim 5	Collateral sensitivity					√					
Dim 6	Project soundness				√	√					
Dim 7	Credit agreement			√		√					
Dim 8	Collateral agreement	√				√					√
Ex. Var 1	**Strength of Sponsor**										
Dim 1.1	Track record		√	√	√	√					√
Dim 1.2	Financial standing				√	√					
Ex. Var 2	**Political and Legal Environment**										
Dim 2.1	Government support				√						
Dim 2.2	Political risk				√		√				
Dim 2.3	Solar power generation related regulation							√	√		
Ex. Var 3	**Financial Strength**										
Dim 3.1	Financing structure				√						
Dim 3.2	Position within sector			√	√	√				√	√
Dim 3.3	Financial soundness	√	√	√	√	√	√			√	√
Dim 3.4	Results of stress analysis				√			√			√
Dim 3.5	Market trend										
Dim 3.6	Duration of the project compared to duration of the credit				√		√				
Ex. Var 4	**Transaction Characteristic**										
Dim 4.1	Project and technology risk				√		√				√
Dim 4.2	Construction risk				√		√				
Dim 4.3	Operative risk				√		√			√	
Dim 4.4	Market risk				√		√				
Dim 4.5	Grid connection						√	√			
Dim 4.6	Approval from appropriate authority			√			√	√			
Dim 4.7	Ethics and social responsibility										
Ex. Var 5	**Mitigation and Security Package**										
Dim 5.1	Reserve funds				√						
Dim 5.2	Assignment to lenders	√			√						
Dim 5.3	Lender's control	√			√	√					√
Dim 5.4	Collateral arrangement			√							

*References: 1: ..., 2: ..., 3: ..., 4: ..., 5: ..., 6: ..., 7: ..., 8: ..., 9: ..., 10: ...

**Components: En. Var: Endogenous Variable, Ex. Var: Exogenous Variable

Table 5. Estimated commercial bank population in Indonesia

Bank's BUKU	Population number (Bank)	Population samples needed (Respondents)	Observed samples (Respondents)	Samples contribution (%)
BUKU 4	6	18	13	72.22%
BUKU 3	25	75	12	16.00%
BUKU 2	52	156	1	0.64%
	83	249	26	

Table 6. Path coefficients significance

Hypothesized Path	Path Coefficients	Sample Mean	STDEV	T-statistics	p Values	p Std.
(H1) Strength of Sponsor -> Project Bankability	0.088	0.071	0.166	0.533	0.594	0.303
(H2) The Political and Legal Environment -> Project Bankability	0.170	0.229	0.184	0.923	0.357	0.182
(H3) Project's Financial Strength -> Project Bankability	0.246	0.259	0.169	1.458	0.146	*0.074*
(H4) Transaction Characteristic -> Project Bankability	0.461	0.389	0.203	2.268	0.024	*0.012*
(H5) Mitigation and Security Package -> Project Bankability	0.093	0.133	0.165	0.564	0.573	0.292

Table 7. Confidence interval biar corrected

Hypothesized Path	Bias	2.50%	97.50%
(H1) SS -> BA	-0.017	-0.134	0.350
(H2) PE -> BA	0.059	-0.071	0.470
(H3) FS -> BA	0.013	-0.013	0.508
(H4) TC -> BA	-0.072	0.233	0.866
(H5) MP -> BA	0.040	-0.249	0.327

Table 8. Bankability criteria classification ranking between BUKUs

Variable	BUKU 4			BUKU 3		
	RII	RII (%)	Rank	RII	RII (%)	Rank
Strength of Sponsor	0.708	19.84%	3	0.696	19.92%	2
The Political and Legal Environment	0.673	18.87%	5	0.664	19.01%	5
Project's Financial Strength	0.744	20.87%	2	0.690	19.74%	4
Transaction Characteristic	0.679	19.03%	4	0.690	19.77%	3
Mitigation and Security Package	0.763	21.39%	1	0.753	21.57%	1
		100.00%			100.00%	

Table 9. Bankability criteria ranking

Variable	Criteria	BUKU 4					BUKU 3				
		RII	RII (%)	Rank	Within Variable Rank	Overall Rank	RII	RII (%)	Rank	Within Variable Rank	Overall Rank
Project Bankability	Project's repayment capacity (BA1)	1.000	13.30%	1	1	1	0.938	12.97%	1	1	1
	Project's Level of cover ratios (BA7)	0.981	13.04%	2	2	2	0.917	12.68%	2	2	2
	Contractor's experience (BA4)	0.942	12.53%	3	3	7	0.792	10.95%	3	3	11
	Cost escalation (BA6)	0.808	10.74%	4	4	17	0.792	10.95%	3	3	11
	Operation team experience (BA2)	0.750	9.97%	5	5	21	0.750	10.37%	5	5	19
	Collateral adequacy and enforceability (BA10)	0.692	9.21%	6	6	30	0.646	8.93%	6	6	31
	Proposed terms and conditions (BA8)	0.673	8.95%	7	7	31	0.646	8.93%	6	6	31
	Covenant package (BA9)	0.596	7.93%	8	8	36	0.625	8.65%	8	8	36
	Performance incentives within the operation and maintenance contract (BA3)	0.558	7.42%	9	9	40	0.521	7.20%	10	10	50
	Collateral value sensitivity (BA5)	0.519	6.91%	10	10	46	0.604	8.36%	9	9	38
			100.00%					100.00%			
Strength of Sponsor	Sponsor's additional support in the form of standby equity (SS4)	0.904	2.97%	8	1	11	0.792	2.65%	9	1	11
	Sponsor's financial standing (SS3)	0.808	2.65%	14	2	17	0.750	2.51%	15	2	19
	Sponsor's repayment history (SS1)	0.731	2.40%	18	3	23	0.667	2.23%	24	3	29
	Sponsor's performing behaviours concerning tax obligation, supplier, and customer (SS2)	0.635	2.08%	27	4	34	0.646	2.16%	26	4	31
	Sponsor's industry experience (SS5)	0.462	1.52%	40	5	50	0.625	2.09%	29	5	36
The Political and Legal Environment	Enforceability of government's contracts and guarantees (PE1)	0.865	2.84%	11	1	14	0.792	2.65%	9	1	11
	Government's backing on the project (PE2)	0.865	2.84%	11	1	14	0.771	2.58%	12	2	16
	The adequacy of tariff regime (PE6)	0.788	2.59%	15	3	19	0.771	2.58%	12	2	16
	Project's sensitivity to policy changes (PE4)	0.769	2.53%	16	4	20	0.729	2.44%	16	4	21
	Local content regulation (PE8)	0.750	2.46%	17	5	21	0.708	2.37%	20	5	25
	Political force majeure (PE5)	0.577	1.90%	30	6	38	0.521	1.74%	41	7	50
	The long-term importance of the project to the country (PE3)	0.423	1.39%	42	7	52	0.479	1.60%	43	8	53
	BOOT regulation (PE7)	0.346	1.14%	43	8	53	0.542	1.81%	37	6	46
Project's Financial Strength	Project's profitability (FS7)	0.981	3.22%	1	1	2	0.917	3.07%	1	1	2
	Amortization schedule (FS2)	0.942	3.10%	5	2	7	0.833	2.79%	8	2	10
	Duration of the project compared to the duration of the credit (FS10)	0.942	3.10%	5	2	7	0.729	2.44%	16	3	21
	Form of financing structure (FS1)	0.885	2.91%	10	4	13	0.708	2.37%	20	4	25

Category	Factor										
	Developer's financial capability (FS6)	0.731	2.40%	18	5	23	0.708	2.37%	20	4	25
	Electricity demand (FS9)	0.673	2.21%	25	6	31	0.667	2.23%	24	6	29
	Project's financial levers (FS4)	0.635	2.08%	27	7	34	0.646	2.16%	26	7	31
	Result of stress analysis (FS8)	0.577	1.90%	30	8	38	0.583	1.95%	32	8	41
	Project's competitiveness in terms of Levelized Cost of Electricity (LCOE) (FS3)	0.558	1.83%	32	9	40	0.563	1.88%	35	9	44
	Project's total assets (FS5)	0.519	1.71%	37	10	46	0.542	1.81%	37	10	46
	Construction delay risk (TC3)	0.981	3.22%	1	1	2	0.917	3.07%	1	1	2
	Quality of offtake agreement (PPA) (TC9)	0.981	3.22%	1	1	2	0.896	3.00%	3	2	5
	Off taker track record (TC8)	0.962	3.16%	4	3	6	0.896	3.00%	3	2	5
	Power generation and construction permit (TC11)	0.731	2.40%	18	4	23	0.771	2.58%	12	5	16
	Grid connection deadlines in the contract (TC10)	0.712	2.34%	22	5	27	0.604	2.02%	30	8	38
	Developer's ethical management (TC13)	0.712	2.34%	22	5	27	0.792	2.65%	9	4	11
Transaction Characteristic	Proven technology (Photovoltaic) (TC1)	0.654	2.15%	26	7	33	0.604	2.02%	30	8	38
	Operation team internal control (TC5)	0.596	1.96%	29	8	36	0.646	2.16%	26	7	31
	Developer's environmental and customer value orientation (TC14)	0.558	1.83%	32	9	40	0.729	2.44%	16	6	21
	Solar resource and energy yield (TC2)	0.538	1.77%	34	10	43	0.563	1.88%	35	12	44
	Project's incentive eligibility (TC4)	0.538	1.77%	34	10	43	0.542	1.81%	37	13	46
	Reliable planning and forecasting data (TC6)	0.538	1.77%	34	10	43	0.583	1.95%	32	10	41
	Certified accounting information (TC7)	0.519	1.71%	37	13	46	0.583	1.95%	32	10	41
	Land acquisition risk (TC12)	0.481	1.58%	39	14	49	0.542	1.81%	37	13	46
	Lender's control in Escrow account (MP3)	0.942	3.10%	5	1	7	0.875	2.93%	5	1	7
	Transferability clause of the credit agreement (MP2)	0.904	2.97%	8	2	11	0.854	2.86%	6	2	8
Mitigation and Security Package	Government's guarantee (MP5)	0.846	2.78%	13	3	16	0.854	2.86%	6	2	8
	Guarantee's coverage (MP4)	0.731	2.40%	18	4	23	0.729	2.44%	16	4	21
	Developer's reserve account (MP1)	0.712	2.34%	22	5	27	0.708	2.37%	20	5	25
	Third-party guarantee (MP6)	0.442	1.45%	41	6	51	0.500	1.67%	42	6	52
			100.00%					100.00%			

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