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ANALYSIS OF FINANCIAL RISK IN PROJECT FINANCE OF OIL AND GAS REFINERY EXPANSION IN INDONESIA

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ABSTRACT

"This study aims to analyze the financial risks in implementing Project Finance Funding in Special Purpose Vehicle Entities (SPV). This study used qualitative descriptive methods through documentation, focus group discussions (FGD) and interviews which were analyzed using content analysis, thematic analysis and validity test. Moreover, this study refers to Transaction Cost Theory and Agency Theory. This study identified financial risks associated with the pre-financing phase such as late disbursement and post-closing additional costs such as transaction costs, commodity exposure, and agency conflicts. This study also found that entities link financial risks with losses that will arise by setting a Risk Tolerance Limit value of 5% of the project value. In addition, this study founds that standardization of risk management for companies facilitates entities to apply for foreign funding in line with sponsor companies that follow ISO 31000:2018."

Keywords: *Project Finance; Special Purpose Vehicles; Financial Risk, Transaction Exposure, Agency Conflict*

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INTRODUCTION

The oil and gas industry are essential in driving the Indonesian economy. This industry is susceptible to movements in world commodity prices, so this has implications for the price products are given to the public. Based on data presented by the Special Task Force Executing Upstream Oil and Gas Business Activities (SKK Migas), Indonesia had oil reserves of 3.2 billion barrels at the end of 2018. Based on SKK Migas (2020) explained that the upstream oil and gas industry in Indonesia operates inefficient equipment, which occurs decline in the domestic lifting process from year to year from 1977 to 1955 continued until domestic production of petroleum reached 1.62 million barrels per day (bpd). Even in 2016, domestic oil production fell drastically to 831 million bpd; in 2020, it reached 706 million bpd. Thus, every year there is a decline in the range of 3% to 5% per year.

In minimizing risks arising from the parent company or principal (PT PTM) for the construction of oil and gas refineries. Principal provides funding through Project Finance through credit from third parties (loans) with a Trustee Borrowing Scheme (TBS) mechanism, with a Capital Expenditure value of USD 6.7 billion. Project Finance is the funding arrangement required for developing a project provided by loan payments and adjusted to the Project's cash flow (Tant and Vong, 2001).

Figure 1 shows the Project Finance funding mechanism from lenders, where PT PTM, represented by PT KPI, forms a Tolling Fee agreement in the form of a contract for the Delivery and Processing of Raw Materials and Manufacturing and Product Offtake. According to Salih & Salih (2017), an Offtake Agreement is a legal contract between two parties regarding a certain quantity of goods to be sent from the producer to the buyer. The Offtake Agreement provides certainty that any results produced by PT ABC can be purchased by PT KPI, thereby transferring market risk from PT ABC and Lenders. This provides certainty of safe supply to the off-taker and product capability and secures the flow of payments for PT ABC. According to the Offtake Agreement classification in Salih & Salih (2017), it is classified as a take and pay agreement, which means that the off-taker can pay if the producer provides products that meet the agreement and demand.

In calculating the Tolling Fee mechanism between PT KPI as off-taker and PT ABC as producer, the parties agreed on the Tolling Fee = Margin calculation + Debt Service + OPEX. With the off-taker agreement mechanism, as explained above, between PT KPI as principal and PT ABC as agent, agency conflicts can arise that arise from agency conflicts in the context of increasing short-term and long-term investments. Long-term beyond the best investment level, which leads to short-term or long-term company policies, can give rise to gaps in pay for performance or Asymmetric Pay for Performance (Gryglewicz et al. 2020). The relationship between agent and principal needs to be based on solid trust, where all information related to the development of the company owned by the principal, in this case PT ABC, needs to be reported to prevent agency problems.

In implementing Project Finance, an organization is formed to implement the project using a non-recourse debt mechanism. According to Scharfstein & Stein (2000), the organizational separation between the sponsor and project company regarding project cash flow from other sponsor assets prevents inefficient investments or subsidies from different divisions. An analysis of governance and structure in Project Finance can create a controlled environment that eliminates various influences on PT ABC's finances. Although PT ABC has adopted international standards Risk Management Standard or ISO 31000:2018. Masih terdapat kemungkinan tidak diakuin this standard only provides a general approach to managing all types of risks and is not specific to certain industries or sectors. So, there is no financial risk management that the company can measure; all risk determination depends on the ability and experience of PT ABC's management.

Based on the description above, a study was conducted with the title: "Analysis of Financial Risk In Project Finance of Oil And Gas Refinery Expansion In Indonesia".

LITERATURE REVIEW

To explore the problem, this study uses Transaction Cost theory and Agency Theory. According to Williamson (1991) that companies have limitations, so certainty is needed in answering doubts about when the activity occurs in the market, and when the activity occurs within the company. These doubts are answered with the Transactional Cost Theory which is able to estimate the governance of an organization, market or alliance can be used. In determining transactions, there are at least three criteria that must be met: uncertainty, repetition, use of related assets, and costs incurred for an activity. Richter (2000) in Rao (2003), explained that Transactional Costs are costs that arise from resources used for the creation, maintenance, and operation of a company. Focusing on the cost of information and related organization is sometimes not enough to understand the totality of costs. Moreover according to Scott (2008) Agency Theory is a formal interaction in the form of a relationship or contract between the principal and the agent, the agent is the party that carries out the interests of the principal while the principal is the party that hires the agent to perform tasks for the benefit of the principal so that business activities are not always managed directly by the owner. Meanwhile, according to Eisenhard (1989) in Joslin (2019), agency theory predicts that outcome-based contracts will reduce conflict of goals. Further, a results-based contract identifies the principal's objectives and states that the agent will be compensated when the objectives are achieved.

Based on previous studies, according to Moeller (2011) companies or business people only informally assess a risk area and then make decisions with insurance. Meanwhile, according to Apostolik (2023), it is explained that risk management disasters in companies are caused by failures in recognizing and properly handling an event, therefore identification is needed beyond the company's operational reasonableness. This is reinforced by Ramiah, V. et al. (2016), Australian corporate treasurers are susceptible to various biased behaviors (such as selfishness, high self-

confidence, reluctance to lose, and restraint bias) and these behaviors can influence their decisions. Project Finance, also known as a "financing contract", is financing and the formation of collateral for the convenience of the funder and is based on the idea that project risks are identified in advance, allocated to those who are best able to bear them, and mitigated in such a way that future risks are acceptable to lenders and contained in contractual relationships (Clifford, 2021). Meanwhile, according to Shah (2018) the financial success of a company does not depend on the company's capital volume. However, the financial success of a company is due to its ability to fulfill its obligations in the various transactions it makes. So the company must manage its cash in such a way that it can provide a further picture of the various financial transactions in a project.

METHODS

This research uses a strategy in the form of a case study. The case study is a strategy to deeply understand the research process (Saunders et al, 2019). Based on this explanation, a research strategy in the form of a case study was used to obtain in-depth information regarding the Project Finance process in the Development of the National Strategic Project (PSN) for developing an oil refinery carried out at PT ABC.

This research uses a combination of primary data and secondary data. Primary data in this research is obtained directly from sources participating in the National Strategic Project (PSN) for refinery development at PT ABC. Data was collected through interviews and FGD (focus group discussions) with company employees. Meanwhile, secondary data is obtained through document review to support primary data through secondary data in internal documents such as Financial Models, Insurance Reports, and Due Diligence Reports. In understanding the document, the author added confidence regarding the research topic with interviews and FGDs conducted with related parties.

This research collected data from document reviews, namely by reviewing documents obtained from PT ABC. There are many internal documents related to research, but at this stage, the document review is limited to the following documents:

a. Internal Company Guidelines regarding Risk Management

b. Corporate Risk Standards and Mitigation

c. Funding and organizational structure of the SPV

This research uses content and thematic analysis techniques to process data from interviews with FGDs and review internal company documents. The data analysis process through content analysis techniques is carried out by comparing and harmonizing information obtained from document reviews, interviews and FGDs so that a mapping can be obtained from the perspective of individuals within the company. If mixed results are found, it is hoped that the risk analysis will be better (Birmingham and Wilkinson, 2003; Shauki, 2018). In addition, this research uses thematic analysis techniques to analyze quantitative data, which is then converted into narratives that can be analyzed qualitatively by studying the company's Financial Model and repayment

model. This research also examines the risks arising from the Project Finance funding mechanism in the oil and gas industry.

In carrying out this research, a holistic (single unit) analysis case study approach was used. According to Ridder (2012), a holistic single-unit approach is based on systemic analysis of a phenomenon, an individual or an organization that finds uniqueness or unique characteristics. The aim of a holistic (comprehensive) case study is to provide a complete and detailed picture and explanation of a case as a whole, this can be done by identifying company operations on a theoretical basis and data analysis. According to Sugiyono (2013), the theoretical basis of the research proposal shows how far one understands the problem being studied. Therefore, this research was carried out by identifying the stages in formulating Project Financing funding activities at PT ABC, which has different Project Financing stages compared to other companies. This was caused by parties acting as Lenders, PT ABC receiving loans from Commercial Bank and Export Credit Agencies.

RESULT AND DISCUSSION

In the data collection stage, the author used 3 (three) research instruments, starting from reviewing internal documents, interviews, and FGDs conducted by PT ABC related to funding the development of the National Strategic Project (PSN). In addition, this study also conducted unstructured interviews with respondents totaling 4 (four) people from PT ABC who have a relationship with their position and funding activities and risk mitigation processes. The data was collected through FGD with external parties related to financial risks, namely Bank Mandiri and Financial Consultants. This study is expected to obtain data validity by using the triangulation technique.

Internal Documentation

Using content analysis, this study found 3 (three) main points of discussion, namely the construction phase, commissioning phase, and operation phase. The construction phase is the physical and non-physical construction stage of the oil refinery project, which includes the physical process of engineering, procurement of goods and services, and construction at the location. In contrast, non-physical is preparing operations-related systems to train supporting human resources. In financing the PT ABC project, there is no "guarantee" for the return of its financing. Financial risks that concern companies in the construction phase are certain things that are restricted or should not occur as required in the agreement, which then impacts the delay in disbursing funds to pursue the payment of the remaining development completion. After the construction phase, there is a commissioning phase in which testing is carried out on the entire process that is designed, installed, operated, and maintained in accordance with the set requirements.

Furthermore, the operation phase is carried out when the company already has income, then the company also must repay the loan within the specified time frame. PT

ABC determines the assumption of income to operational costs so that the principle of cost against revenue can be fulfilled. Assuming the company's revenue through the Tolling Agreement, It can cover all costs from operating new and old refineries. Through the Tolling Agreement, products processed from raw materials submitted to PT ABC using new refineries can be billed to PT KPI as Supplier or principal with the cost component of acquiring new refinery assets, principal, interest, and company profits. In addition to these fees, other fees can be attributed to Tolling In the form of gas transportation costs, labor costs, repair costs for new refineries, material costs, supporting construction costs, new refinery land leases, financing, and insurance costs. In the funding mechanism Project Finance, the company obtains external funds to share the risk in the construction and commissioning phases. Then, it makes periodic payments every six months over 14 years after operations, as depicted in Figure 2.

Based on Figure 2, PT ABC as an SPV received funding sources only through PT KPI in the form of company capital of USD 3.1 billion, Pre-Opex revenue of USD 467 million, and Project Financing worth USD 3.1 billion during the loan repayment period of PT ABC could not receive loans or income from other parties. Based on Figure 5.1 The potential cash outflow in the Tolling Fee as compensation to PT ABC for the refinery processing services provided to PT KPI is divided into specified margins, loan services, and operating costs (OPEX). The margin of USD 500 Million is defined for the processing services provided and is PT ABC's primary source of operating income. Loan Services worth USD 3.3 billion are the principal of the loan, and interest is paid to the project financing lender until the end of the loan period. OPEX is the cost incurred to produce direct products, such as fixed operating costs, variable operating costs, taxes, and sustainable capital expenditures required to run the RDMP Refinery.

In Figure 3, the Risk Management Principles are the basis of implementing all risk management to create and protect the company's value. In its implementation, PT ABC can build and protect value through eight actions through human and cultural factors through the implementation of the Risk Management Academy as well as risk management as part of the company's culture, sustainable development through Risk Maturity Assessment and risk management development roadmap, integration through Risk Based Budgeting as well as risk assessment of investment proposals, structure and comprehensive through risk governance and supervision structures, customization through adjustment of Risk Tolerance Limits (BTR) by the company's capabilities and resources, inclusive through the creation of Risk Registers made with the help of related party data and expertise, dynamically through the renewal of the BTR to the update of the risk register and specific studies, the availability of the best information using the latest data in the calculation of the impact and BTR.

The Risk Management Guidelines of PT PTM in 2022 explain the management's commitment to financial and non-financial aspects agreed upon in an integrity pact illustrated in Figure 4. PT ABC's Risk Management process is based on a scheme that starts from determining the scope, context, and criteria through the determination of impact criteria, probability criteria, and Risk Intelligence Map. At this

stage, it is the basis for a risk that the company can determine in the future. In determining risks, PT ABC conducts risk identification, analysis, and evaluation. In risk treatment, by considering the follow-up of risks that have been discovered, the company determines the risk treatment options and their recommendations. In addition to determining the company's risk, there needs to be supervisory actions so that the risk can be measured reliably and that the company maximizes all its potential. Actions are carried out through recording reporting, communication, consultation, monitoring, and review. Using content analysis, this study found that risk identification has an important role. The identification process is supported by 3 (three) processes that previously had to be carried out, such as determining the scope, context, and criteria. Then, there is a process of communication, consultation, supervision, and checking. In the process of stages according to Figure 4, if a process is skipped, it will cause the identification of risks with insufficient information.

Interview

Interviews in the study were conducted in a semi-structured manner, where interviews were conducted with resource persons who had the capacity of positions by the research objectives. Interviews were conducted with respondents from May 7 to 15 2023, which were conduct offline with a duration of 45 minutes. Interviews are used to deepen the thematic analysis found in the study of the document. In interviews, researchers received information about various potential problems in PT ABC. Then, this research appoints competent resource persons and is carried out face-to-face. The resource persons were obtained from PT ABC, located in Jakarta, and branch offices in Balikpapan, so they used online interview media with Microsoft Teams. The selection of respondents in Table 2 is carried out through the identification of the job description specified in the company, namely managing the process of determining the business funding scheme and measuring its risk treatment, controlling transactions related to cash, seeking short-term and long-term funding, regulating the use of company funds before and after Financial Close.

Based on interviews, some of the themes found in the interviews conducted with the respondents can be described as follows:

-Transfer Financial Risk

> *"... The RDMP project or Refinery Development Masterplan, is a unit of refinery development projects to reduce fuel product imports. The Project's construction is among the units still operating because the Balikpapan refinery is responsible for the availability of 26% of national fuel needs. With a total cost of USD 7.4 billion, the RDMP project is the largest PSN project. (R3, 2023)*
>
> *"... In the RDMP Project, PT ABC builds new refinery units and supervises other supporting projects. There are 20 other supporting projects whose supervision process is carried out by PT ABC. (R3, 2023)*

"In the agreed Facility or Loan Agreement, PT ABC received funding of 3.1 Billion USD or oversubscribed 142%. The funding is sourced from 3 ECAs and 22 Commercial Banks. In the disbursement process, PT ABC uses the Trustee Borrowing Scheme mechanism, where the disbursement and repayment process will be assisted by Trustees and agents (R1, 2023)
"The external funding process with Project Finance avoids the existence of asset guarantees that the World Bank Negative Pledge prohibits. Because PT ABC is a subsidiary of a state-owned enterprise, there is a prohibition on guaranteeing its assets. Therefore, PF is determined as a funding mechanism that is by guaranteeing cash flow for 14 years (R1, 2023)

-Risk Identification

"... Risk Management is a management need in knowing project risk management, especially Priority projects, which is mandatory to report to KBUMN.." (R3, 2023)
"... Ensuring that the work plan and risk management have been carried out by PT ABC effectively and efficiently, by identifying deviations and strategic issues in achieving project targets (early warning) so that further handling can be carried out in managing risks." (R4, 2023)
"... Corporate Risk Management is carried out on the basis of identifying scope, context and criteria. These three things ensure the reliability of PT ABC in identification in the next stage.." (R3, 2023)

Thematic analysis is carried out in this study, which aims to find a theme from the interview results to make it easier to identify the pattern formed. In thematic analysis, this research deepens the topic based on 3 (three) main themes. The determination of the three themes was obtained from the results of interviews, there are three points that are considered relevant to the research by the research objectives and describe the phenomenon. There are 3 (three) themes found from the method: risk identification, financial risk, and risk transfer. On Corporate Risk Identification, according to the results of interviews with R2 Resource Persons, documents are fulfilled as a priority condition or conditional precedence (CP), which makes the company late in receiving the disbursement of funds or Financial Drawdown. In the loan disbursement process. Due to the large number of parties involved in the fulfillment of the CP, PT ABC has risks that are in line with the Transactional Theory and Agency Theory, with significant delays due to the complexity and increasing costs of other funding activities while waiting for the disbursement of the project finance funds.

On the next thematic analysis, Financial Risk resource person R1 explained that PT ABC uses a Trustee Borrowing Scheme, according to Figure 5. However, in identifying financial risks in Project Finance, it is stated that Bank Indonesia Regulation 16/10 article 13 explains that the Foreign Debt Debtor must withdraw every Foreign Debt Loan Fund or DULN through a Foreign Exchange Bank domiciled in the Republic of Indonesia. The obligation to withdraw such debt applies to cash funds

derived from (a) Foreign Debt based on credit agreements or (loan agreement) in the form of non-revolving and not used for refinancing, (b) Difference in facilities Refinancing with the amount of the old external debt, and (c) External Debt based on debt securities in the form of Bonds, Medium Term Notes, Floating Rate Notes, Promissory Notes and Commercial Paper. Based on the Transactional Cost Theory, PT ABC may be burdened with additional loan fees due to these provisions; this is due to the difference in time zones between Agent – Onshore Bank – Offshore Bank, while PT ABC must insure the loan for 16 years in the form of Premium Fee on the same day when the disbursement is made. There are other quotes in the interview related to risk identification, including.

> *"At the stage of fulfilling the Project Financing document ahead of Closing, PT ABC was requested by the Export Credit Agencies (ECA). So that anything that is outstanding in the fulfillment of documents provides a risk of delay because the fulfillment of documents that are technical and operational, if not fulfilled, contributes to delays in Financial Close to default." (R1, 2023).*
>
> *"The basis for determining risk in PT ABC currently follows the guidelines set by the parent company. Five points are Risk Priority in March 2023, including Commercial, External, HSSE, Management and Technical. (R4, 2023)*
>
> *"The risk determination that has been taking place is based on the RIM or Risk Identification Map. However, RIM itself has been determined through the parent company's guidelines, thus reducing the effect of its flexibility. Then, individual experience becomes the basic benchmark for determining potentially risky events. (R4, 2023)*

Risk Transfer is a theme to follow up on financial risks due to funding activities. One way the company does this is by implementing hedging against its fluctuating interest rates. The purpose of hedging accounting is to show the results of risk management activities that use financial instruments to manage exposures arising from certain risks that may affect profit and loss (P&L) or other comprehensive income (OCI). Then, based on the results of the interview, it was found that the company implemented risk control based on PSAK 71 paragraph 6.5.2, where hedging of cash flows, i.e., the risk hedged in cash flow hedging, is the exposure to the variability of cash flows attributable to certain risks associated with recognized assets or liabilities, unrecognized definite commitments or forecasts of highly likely transactions, where fluctuations in these risks can affect the income statement. Future cash flows may relate to existing assets and liabilities, such as future interest payments or receipts on debt at floating interest rates. The volatility of future cash flows may result from changes in interest rates, exchange rates, equity prices, or commodity prices. In practice, hedging of these cash flows is often carried out by companies that make long-term loans with variable interest rates following market interest rate movements. Transactional Cost Theory plays a role in determining organizational governance so that it can determine the percentage of hedging by the risk ability that can be borne in the repayment period.

Focus Group Discussion (FGD)

This research conducted an FGD to deepen specific topics in the Risk Management Guidelines and was carried out at a predetermined time. This FGD was attended by 15 speakers with knowledge and experience in Project Finance at PT ABC, as listed in Table 3. In the FGD, this research deepens the theme of Scope/Project Overview, Project Status, Project Performance, Project Economics, Risk Rating Status, Strategic Issues, and Prescriptive and Subsequent Events/Issues. Through content analysis, in-depth discussions are carried out on the data that has been collected. The data obtained is then analyzed using the content analysis method, so a relationship is found between the overall risk data collection process within the company to associate a financial risk. Then, this study uses the typology of economic risk to relate the frequency of discussion in the FGD and the probability shown in Table 4. This study found that companies have identified financial risk through the relationship of probability with its implications. The greater the likelihood of financial risk, the company can determine the cause of the risk or Risk Cause, which is getting bigger in line with the probability of risk. The high probability has a significant effect on PT ABC's operations, it mainly arises from risks related to external parties, such as market risk, loan risk, financial risk, and operational risk. This is by the confirmation of the results of the interviews submitted to the respondents. In market risk, the company determines the occurrence of Risk Causes such as the potential of PT ABC to be exposed to floating interest rates and an increase in OPEX exceeding economic assumptions; the Project does not get an Equity Partner or capital deposit.

From the results of FGD data collection and document search, this study found that the standardization of corporate risk management, this study deepens the basis for determining whether an event can be identified as a risk, according to the results of interviews:

> *"Integrating risk management depends on understanding the company's structure. The structure differs depending on the organization's goals, goals, and complexity. Risk is managed in every part of the organizational structure. Every individual in an organization has a responsibility to manage risk." (R1,2023)*

Referring to the company's internal documents, the company develops a Risk Culture with the achievement of a cultural level, it is necessary to measure the maturity level of risk management. Measuring the maturity level of risk management refers to the main parameters in the roadmap risk management development. Each main parameter needs to be formulated with technical parameters that are specific and measurable. The measurement of cultural maturity is carried out periodically, considering the needs and resources owned. Suppose in the future a provision in this guideline is contrary to the Articles of Association and laws and regulations. The Articles of Association and such rules and regulations shall be enforced in that case. As an affiliate of the parent company, PT ABC has the potential for standardization changes that do not adjust to its business interests. As the principal, PT KPI can

determine a standard that can have implications for its own strengthening but weakening of its agents. The importance of Agency Theory in the standardization of the parent company's risk cannot be followed by PT ABC as an agent because it is outside the business being conducted. This may have occurred due to the engagement between PT ABC and lenders in the form of an agreement that binds all operations of PT ABC.

CONCLUSION AND RECOMMENDATION

This research aims to analyze financial risks in implementing Project Finance Funding in Special Purpose Vehicle (SPV) Companies. Based on the findings and analysis of Chapter 5, this research revealed market risks related to Project Finance funding, namely exchange rate risk (transaction exposure), equity risk and interest rate risk. However, this research finds that SPV cannot avoid risks related to agency conflicts, especially in terms of sponsor interests. From the data collection results in interviews and internal documentation, it was found that the exchange rate (transaction exposure) arises from the time difference between obligations that arise and when those obligations are due to be fulfilled or completed. Meanwhile, in allocating equity risk or Project Finance funding, PT ABC must maximize the Debt-to-Equity ratio (DER). Project Finance typically involves financing long-term infrastructure, energy and industrial projects based on complex legal and financial structures where project debt and equity are used to fund the project, rather than conventional balance sheet items or credit from the project sponsor. Meanwhile, interest rate risk arises from project financing debt, which usually has a variable interest rate, which means that every increase in the LIBOR/SOFR interest rate will increase the project's debt service costs. Based on the findings and data analysis, this research found that the interest in Agency Theory in risk standardization of the parent company cannot be followed by PT ABC as an agent because it is not in line with the business carried out due to weak financial risk analysis at PT ABC.

Therefore, the Project Finance funding process may fail, especially related to the PT KPI sponsor's capacity to complete loan contract obligations. Nevertheless, this research revealed the mitigation of financial risks carried out by PT ABC through training for risk PICs in accordance with the interests of PT KPI as principal. Apart from training, FGDs involve all departments through monthly Risk Mitigation Implementation Updates. From the data analysis that has been carried out, this research tries to provide a solution to increase the effectiveness of PT ABC's financial risk mitigation by developing hedging guidelines that are in accordance with its business processes, especially regarding recording hedged derivative assets. In addition, in carrying out appropriate mitigation for PT KPI, the Risk Tolerance Limit (BTR) of 5% of the project value must be adjusted to address potential risks that arise. This is because, as an affiliate of the sponsoring company, PT ABC has the potential for standardization changes that adapt to its business interests, rather than adjusting PT KPI as the principal can determine a standard that can be followed together.

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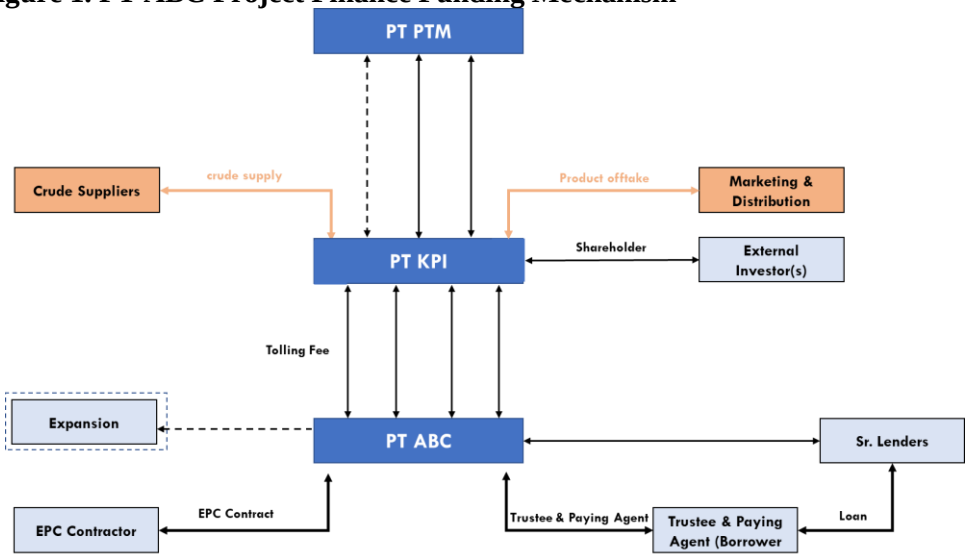
APPENDIX

Figure 1. PT ABC Project Finance Funding Mechanism



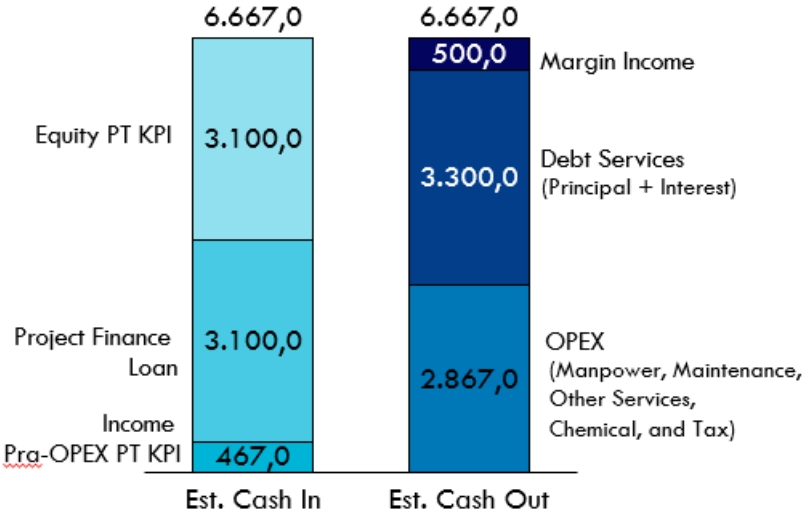
Source: PT ABC's internal documents that have been reprocessed by the author

Tabel 1. Cost Structure PT ABC

Operational Cost Assumptions	Information
Cost of New Refinery	Margin determined, Loan Services (Loan Principal and Interest), Opex (Labor Costs, Repairs, Materials, Other Services and Taxes)
Cost of Old Refinery	Labor, Repairs, Supporting Materials, Other Costs
Cost of Land Lease	Land lease on New Factory

Source: PT ABC's internal documents that have been reprocessed by the author

Figure 2. PT ABC Tolling Fee Cash Management Chart



Source: PT ABC's internal documents that have been reprocessed by the author

Figure 3. Principles of Risk Management

Source: ISO 31000:2018 which has been reprocessed by the author

Figure 4. Risk Management Process

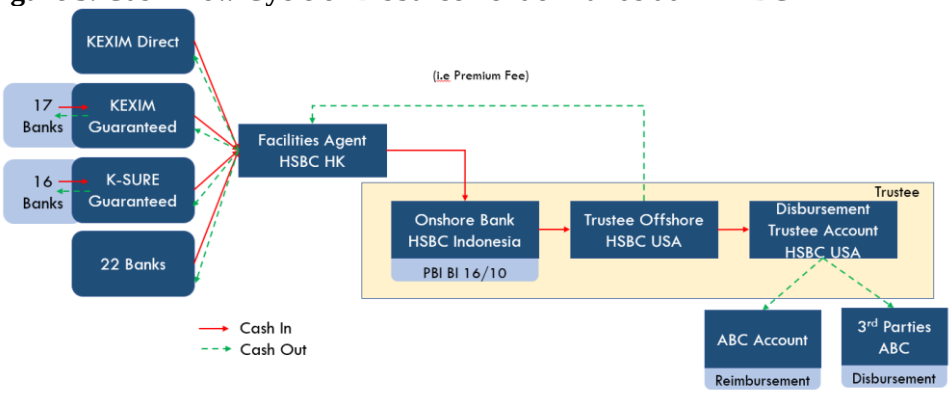
Source: ISO 31000:2018 which has been reprocessed by the author

Table 2. List of Research Interview Respondents

No.	Respond	Gender	Working Period	Last Position
1.	R1	Man	> 15 Years	Manager Corporate Finance
2.	R2	Woman	5 Years	Analyst I Project Finance Internal Matters
3.	R3	Man	3 Years	Jr Analyst II Risk Management
4.	R4	Man	3 Years	Jr Analyst II Project Management

Source: Interview data that has been reprocessed by the author

Figure 5. Cash Flow Cycle of Disbursement of Funds at PT ABC



Source: Interview data that has been reprocessed by the author

Table 3. List of Resource Persons for Research FGD

No.	Narasumber	Gender	Last Position
1.	N1	Man	Jr Analyst Project Risk

2.	N2	Man	Jr Analyst II Risk Management
3.	N3	Man	Sr Engineer I Field Mechanical & Piping
4.	N4	Man	Sr Analyst Budget Planning & Control
5.	N5	Man	Ast Manager HRM Services
6.	N6	Man	Sr Inspector I Field ISBL Mech & Piping
7.	N7	Man	Jr Engineer II Mechanical & Rotating
8.	N8	Man	Sr Engineer II Interface & Intgr. Offsite
9.	N9	Woman	HSSE Lawe Lawe
10.	N10	Man	Jr Legal Counsel II Operation
11.	N11	Man	Jr Engineer II Field Stationary
12.	N12	Woman	Jr Officer II Progress Control
13.	N13	Man	HSSE Lawe Lawe
14.	N14	Man	Engineer II Utility
15.	N15	Man	Sr Officer II Board Support

Source: FGD data that has been reprocessed by the author

Table 4. Results of Financial Risk Identification of PT ABC

Risk Categories	Risk Sub Category	Risk Probability	FGD Content Frequency
Market Risk	Interest Rate Risk	10	3
	Exchange Rate Risk	5	1
	Equity	8	3

Source: FGD data that has been reprocessed by the author

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