

# The Choice of Infrastructure Project Financing Strategies: A Case of A Seaport in Indonesia

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**Abstract**—This paper aims to understand the financing decision for a seaport project in Indonesia from various perspectives. An online survey and a focus group discussion are conducted to gain insights from the Indonesian seaport stakeholders regarding the most effective financing vehicle for seaport infrastructure projects. Furthermore, this paper presents a case study of a seaport infrastructure project financing strategy by constructing cash flow simulation model based on different financing scenarios to illustrate the effectiveness of the alternate ways to finance seaport projects. The survey finds that Indonesian domestic banks syndication, and Public-Private Partnership schemes with government fiscal support are the two most awaited financing vehicles. The cash flow simulation shows that, when a project's internal rate of return is the basis of the decision to distribute project dividend, the project sponsors could benefit from adjusting the project's capital structure. This paper contributes to the research and management practice by revealing the expectation and reality of infrastructure project financing in Indonesia.

**Index Terms**—financing, Indonesia, infrastructure, seaport

## I. INTRODUCTION

Currently, the Government of Indonesia is in the middle of a mission to develop the nation's physical connectivity. Based on the National Development Planning Agenda 2015–2019, just sea transport infrastructure development alone would need an investment of about IDR900 trillion. Most of the funds are estimated to finance the activities to build, improve and extend the 24 selected seaports (five main seaports and 19 feeder seaports, including supporting facilities). This plan would include major developments of Kalibaru (The New Priok) Port, Cilamaya Port, Makassar New Port, Port of Kuala Tanjung, and Port of Bitung [1]. These projects will require considerably more funds than the government could provide. The government tries to boost the support for State-Owned Enterprises (SOEs) development, incentivize the private sector through Public-Private Partnership (PPP) schemes, and invest in state-of-the-art and creative financing schemes.

However, the implementation of this idea of private financing involvement is not simple. The complex nature of infrastructure projects revolves around the two perspectives of decision making: from the perspectives of the public procurer and the private sponsors. In essence, the public procurer has two general alternatives to finance infrastructure projects: with or without private partnerships. Meanwhile, private sponsors have two different financing options. The first option is the

typical on-balance sheet corporate finance, and the second one is utilizing the off-balance sheet treatment of the project finance.

The aim of this paper is to explore various alternatives of seaport infrastructure project financing and explain the underlying motives to utilize those alternatives from the two different perspectives. A case study of the New Priok Container Terminal One (NPCT-1) is provided in an attempt to illustrate how the different scenarios of financing schemes would affect the project risks allocation and, in the end, the project value itself. The case study would identify and assess the existing vehicle utilized to finance the NPCT-1 project, and then compare the existing vehicle with the PPP frameworks and project finance alternatives.

This paper is structured as follows. The next section discusses the two different perspectives of the public procurer and the private sponsors in an arrangement of infrastructure provision, followed by a discussion of risk allocation preferences in PPP projects. Following this discussion, Section 3 describes the methodology used to gain different opinions and insights from various Indonesian seaport industry stakeholders through a survey, a Focus Group Discussion (FGD), and several in-depth interviews. In Section 4, this paper explores the insights from the survey and confirms them with the discussions arising from the FGD and interviews, followed by subsequent cash flow simulation scenarios to illustrate how different financing scenarios would affect the seaport project value. The implications for future seaport infrastructure project financing, and concluding remarks will be provided in Section 5.

## II. LITERATURE REVIEW

In this section, we discuss two perspectives that usually occur in infrastructure project financing structures. We consider the discussion of infrastructure financing from the perspectives of public procurers, and subsequently, the perspectives of private sponsors.

### A. The Public Procurer Perspective: Public-Private Partnerships vs. Traditional Procurement

A competitive benchmark study of the outcomes of Indonesian power projects by G. U. Atmo, Duffield, Zhang, and Wil-

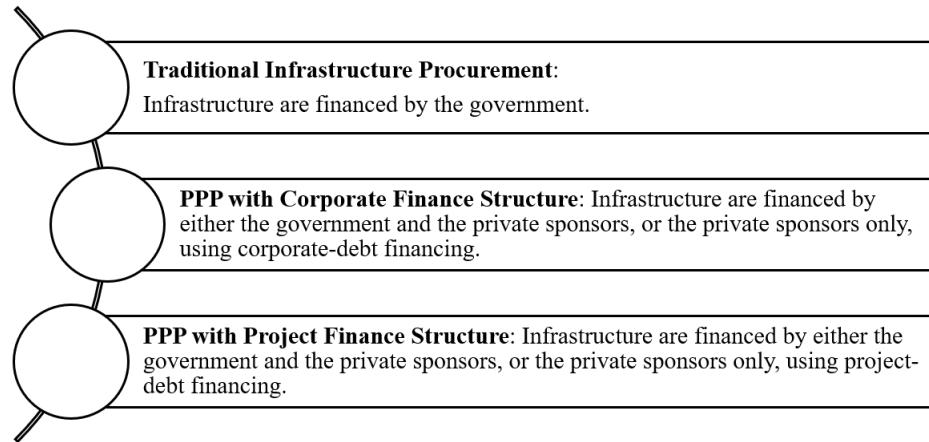


Fig. 1. Infrastructure financing options.

son provides empirical evidence that projects with PPPs have better time performance and better operational availability than projects with traditional procurement [2]. Nevertheless, there was no significant cost difference between the two procurement approaches. In order to resolve the problems with the budgetary constraints and still maximize value for money, G. Atmo and Duffield propose implementation strategies based on their study on the provision of Indonesian PPP power projects post the 2008 global financial crisis [3]. The study highlighted the importance of the regional export credit agencies to support Indonesian PPP power projects and the development of local manufacturing capabilities to reduce the projects' currency exchange risk. These case studies reveal that PPP arrangements need effective strategies to ensure better project deliveries. While the use of PPP provides certain incentives for public procurers, such as better project performance and risk allocation, PPP utilization in seaport-related infrastructure in Indonesia is still limited. Most of the private financing involvement occur under sub-concession contracts through the Indonesia Seaport Corporations (IPCs), the SOEs that are seaport operators, and creating joint-venture project companies to operate container terminals. This situation requires a study to explore alternate procurement strategies such as PPP or procurement improvement that can be implemented by the public procurer.

#### *B. The Private Sponsor Perspective: Corporate Finance vs. Project Finance*

Fundamentally, a company may choose to finance its activities through internal and external financing. There are two main external financing sources, i.e. equity and debt. Project finance is one aspect of corporate finance. To finance a project, the sponsor may choose to use corporate finance or project finance [4]. The difference lies in whether the financing is done on the balance sheet or off the balance sheet. If a company chooses to finance its project with corporate finance, the financing is done on balance sheet financing, meaning that the company is liable to the creditors for the debt payments

used to finance the project in the event of a failure to repay the debt credits. Companies with on-balance sheet financing must bear corporate debt and project debt with the cash flows and assets of the company itself.

Conversely, if a company chooses to finance its project with project finance, the financing is off-balance sheet financing, so the loan is no recourse or limited recourse. Debt payments are solely derived from the cash flows and assets of a Special Purpose Vehicle (SPV) company established for the benefit of the project [4]. While project finance is a common practice in PPP arrangements, there are many cases where a corporate finance approach prevails as a suitable alternative [5]. In a corporate finance structure for infrastructure financing, the project company is usually a wholly-owned subsidiary of the project sponsor or the infrastructure project is recorded as the sponsor's asset. The latter case means that the sponsor may enter directly into a PPP scheme with the public procurer. Compared with the project finance structure, the cost of finance and ancillary cost may be lower in the case of the corporate finance structure. This lower financing and the ancillary cost will result in a lower cost for the public procurer. However, a corporate finance structure is reliant on the financial capacity of the project sponsor and its balance sheet soundness. From the discussion of the two levels of decision making from the public procurer and the private sponsor perspectives, Figure 1 summarizes three different combinations of financing arrangement.

Even though there is a quite vast literature on the effectiveness of each financing options, there is still limited research that gains the industry stakeholders' insights and opinions on those options. Especially for Indonesia as a developing country that currently undergoes a massive infrastructure development, this is important because the Indonesian government is trying to involve more private investors to put their money in those massive projects. The decision makers can do a comparison between the financing options that are being done and the ones that are expected by exploring those insights and opinions.

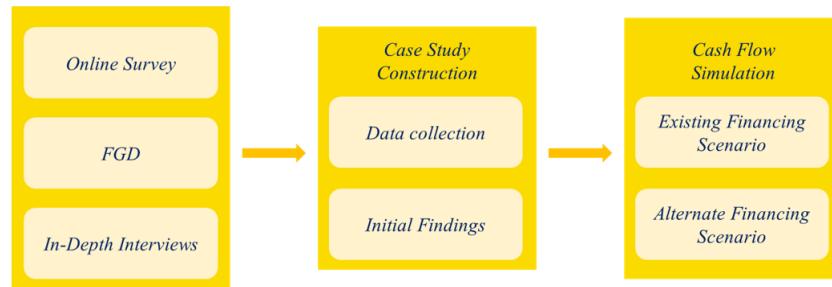


Fig. 2. Research flowchart.

### III. RESEARCH METHODOLOGY

This paper utilizes a combination of qualitative and quantitative methodology approach. First, this paper employs a qualitative approach using an online questionnaire survey, focus group discussions, and in-depth interviews. The survey is conducted to gain insight on the most effective financing vehicle of seaport infrastructure according to various Indonesian seaport industry stakeholders. In the questionnaire, each of the financing vehicle alternatives were given a Likert-scale based value, ranging from (1) “Not at all effective”, (2) “Ineffective”, (3) “Neither effective or ineffective”, (4) “Effective”, and (5) “Highly effective”, which reflects how effective a method of financing is. The sixth response option, “Don’t know”, was provided on the scale for respondents who were not very familiar with the financing vehicle alternatives. The questionnaire utilizes open-ended questions as well. The respondents were also asked how would the decision-making process for infrastructure projects could be improved, the major barriers to gaining project approval, and major development using international providers.

The results from the survey are confirmed with the result of the FGD that we conducted in Jakarta on September 2017. Then, several in-depth interview sessions were utilized to follow up and confirm the information collected in the survey and the FGD. Second, from the FGD, questionnaire, and interview results, this research utilizes a quantitative method with a case study of financing seaport infrastructure on the project of the NPCT-1 to demonstrate how financing decisions can affect project performance and therefore, its value. This research builds cash flow simulations under the existing scenario, the project agreements and assumptions, and compare it with an alternative scenario with different project capital structures, i.e. the ratio of project long-term debt compared to total project initial investment.

The simulations are built under capital budgeting principles. The project value is derived from a Net Present Value (NPV) analysis, where project cash flows are discounted with a risk-adjusted discount rate. This paper does not utilize advanced approaches, such as real options analysis or probability simulation, as our purpose here is only to illustrate how different financing decision, i.e. the capital structure, which is set at the project initiation, might affect the project value to the sponsors. Even though it is common for bigger projects to

use more advanced approaches, it is not necessary to conduct those approaches to achieve the purpose of this paper.

The NPCT-1 case is used in this study as we see that the project has prototypical value [6], in such that we try to highlight the more general aspects of the projects, so that what we can conclude from the NPCT-1 case can be a reference point for other cases of seaport infrastructure development in Indonesia. The research methodology can be illustrated in Figure 2.

### IV. SURVEY RESULTS AND CASE STUDY

#### A. Survey Results

In total, 81 responses were received for the survey, but only 34 were complete and included in the analysis. Half of the respondents are associated with state-owned enterprises and 24% associated with the government at central agencies level. This is consistent with the fact that the Indonesian seaport industry is highly controlled by the government. The majority of the respondents have had experience in Indonesian seaport industry (76%). The respondents’ area of specialization is diverse, such as engineering, seaport management, investment, finance, and legal. In the survey, respondents were asked their opinion on the most effective vehicle or method of financing seaport infrastructure development, and indicate the relative effectiveness of the financing methods using a five-point Likert scale (1 = not at all effective, 5 = highly effective), as shown by Table I. The financing methods are ranked based on their mean scores. The PPP-related methods dominate the top-five financing vehicles or method. These PPP-related methods are the government-guaranteed PPP, PPPs, Availability Funding, and PPP with construction support. PPP with government guarantee has the highest mean score, while the Indonesian bank finance has the highest number of respondents who indicate it as either effective or highly effective vehicle.

#### B. Case Study

In this section, a case study is constructed by having NPCT-1 project’s cash flow simulations under two different scenarios. The first scenario examines the NPCT-1 project’s current financing structure—the contractual relationships between the project company, its sponsors, lenders, and the government. The second scenario is built under a what-if assumption where the project is assumed to be financed under a PPP scheme

TABLE I  
FINANCING VEHICLE/METHOD EFFECTIVENESS (TOP-10 CHOICES)

Rank	Financing Vehicles (FV)	% Agree that FV is Either Effective or Highly Effective	Mean Score	SD of Score	Don't Know	No Answer
1	PPP Government guaranteed	65%	4.1	0.8	3	4
2	Indonesian bank finance	71%	4.0	0.8	1	2
3	Public-private partnerships	62%	4.0	0.9	1	4
4	Availability funding	65%	3.9	0.9	1	2
5	PPP with "in kind"-construction support	62%	3.8	0.8	2	3
6	The arrangement of incentives to attract investment e.g. SEZ	62%	3.8	0.7	3	4
7	Direct company facilitation	59%	3.8	0.9	1	2
8	World bank	56%	3.8	0.9	2	3
9	Private seaport operator finance	56%	3.8	0.7	2	3
10	Viability gap funding	53%	3.7	0.7	3	4

with an annuity availability payments feature. The aim of this case study is to illustrate how the different financing methods might affect the project value and offer different features to the project sponsor.

1) *The Existing Financing Arrangement Overview:* IPC signed a Memorandum of Understanding (MoU) with Mitsui Co. Ltd. (Mitsui) on February 25, 2014, in Tokyo. Together with NYK Line, a Japanese shipping and logistics company, and PSA International Pte. Ltd. (PSA), a Singaporean seaport operator, Mitsui formed a consortium called the Sea Terminal Management & Service Pte. Ltd., a Singaporean-registered company. On April 19, 2014, PT IPC Terminal Petikemas (IPC TPK), a subsidiary of IPC, together with STMS, signed a shareholder agreement for the NPCT-1 project company. IPC, through IPC TPK, owns 51% of the NPCT-1 project company, while STMS owns 49%. The authorized capital of NPCT-1 amounted to USD 30 million. However, even though IPC owns 51% of NPCT-1, STMS provided the whole USD 30 million capital.

The way that IPC and STMS distributed the capital is that STMS made a payment of 51% of the capital to IPC TPK, and this payment was recorded as IPC's liability with 0% interest (initially, the interest was at 7%, but the facility was renegotiated) [7]. Then, IPC TPK placed the capital as an equity contribution to NPCT-1.

As stipulated in the shareholder agreement, STMS have the sole obligation and responsibility to provide funding for NPCT-1. There is one unique feature of the shareholder agreement, namely the Permitted Equity Return (PER) clause. This clause would inhibit IPC to receive any dividend payment from NPCT-1 before STMS achieves a certain rate of return from the project. In other words, STMS will receive all the NPCT-1 dividend until the PER is achieved and IPC will receive the dividends only after the PER is achieved. The PER is calculated as an internal rate of return of the project's cash flow to equity ( $IRR_{equity}$ ). The terminal operation agreement of NPCT-1 expires within 25 years after the date of commencement of commercial operation of the terminal. If the PER has not been achieved, the agreement will be extended until the PER is achieved but with a maximum term extension

of 5 years (total maximum agreement term is 30 years).

There are two sources of return from NPCT-1 for IPC that are fixed, regardless of the terminal operating outcome. The first one is the USD 100 million advanced payment NPCT-1 had to pay to IPC after the 850 meters quay construction was completed. The second one is that NPCT-1 has to pay IPC the fixed site quarterly rent, amounting to USD 14 million, or USD 56 million per annum. The overall contractual relationship that revolves around the NPCT-1 project can be summarized in Figure 3 below.

2) *Simulation under Different PER Rates and Capital Structures:* We build the cash flow simulation under the existing structure. Then, we simulate the project value under the different capital structure. In other words, we simulate the project value as if the NPCT-1 were to be financed with a project finance structure, instead of using the current structure of corporate-debt. Figure 4 presents this simulation result.

It turns out that the more leveraged the project company, the higher the value it can offer to IPC. The rationale is that if the project company is leveraged, then STMS would need so much equity that a higher  $IRR_{equity}$  could be achieved at an earlier time. The earlier the target  $IRR_{equity}$  can be achieved, the more dividend payments are made to IPC. Furthermore, the graph on Figure 4 is shaped in a staged increase. It simply means that the project value will decrease at a certain range of the project company's financial leverage level because the project is required to pay higher debt repayment, but then the value will increase significantly at some levels of leverage because of the extra dividend payment.

In order to better illustrate how different levels of project company leverage may affect the project value, we then simulate the NPCT-1 value under different  $IRR_{equity}$  threshold and compare the result between the unlevered and the levered project company.

Figure 5 shows that at a lower  $IRR_{equity}$  threshold, the unlevered NPCT-1 may offer a higher project value to IPC because at the lower  $IRR_{equity}$  threshold, the unlevered NPCT-1 can receive the same level of dividend payment as the levered NPCT-1, but the latter has to make the debt repayments, hence the debt repayment gap. However, at higher

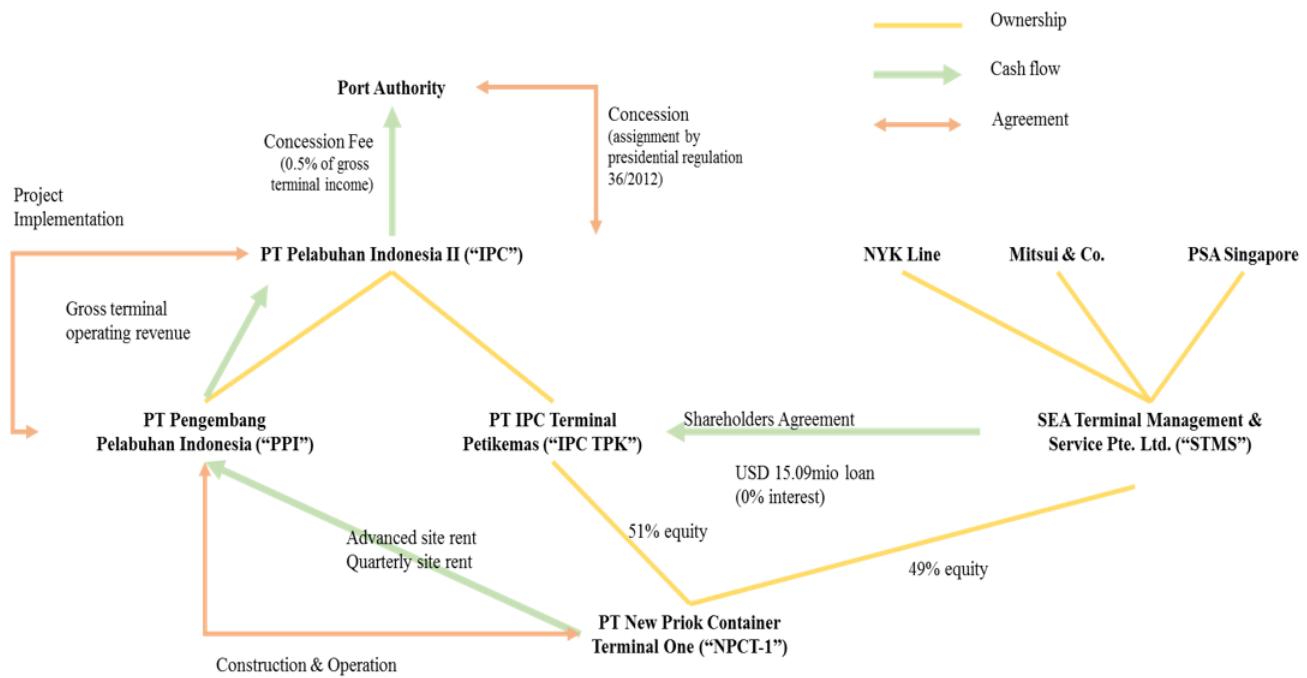


Fig. 3. The contractual relationship and project cash flow around the NPCT-1 project.

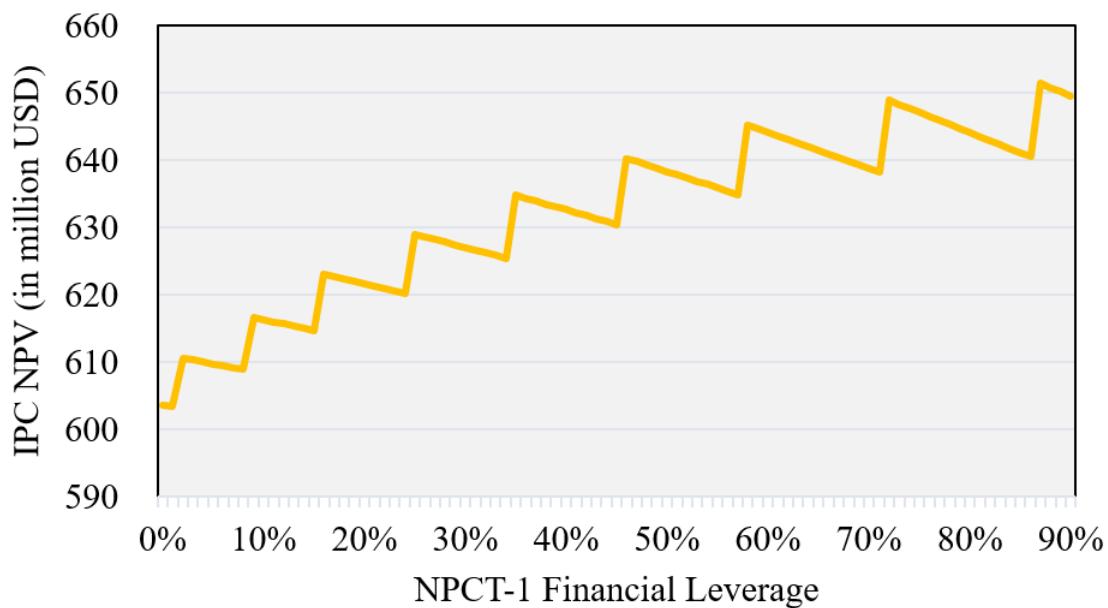


Fig. 4. The effect of the different NPCT-1 financial leverage level on the project value with a certain target of  $IRR_{equity}$ /Permitted Equity Return (PER).

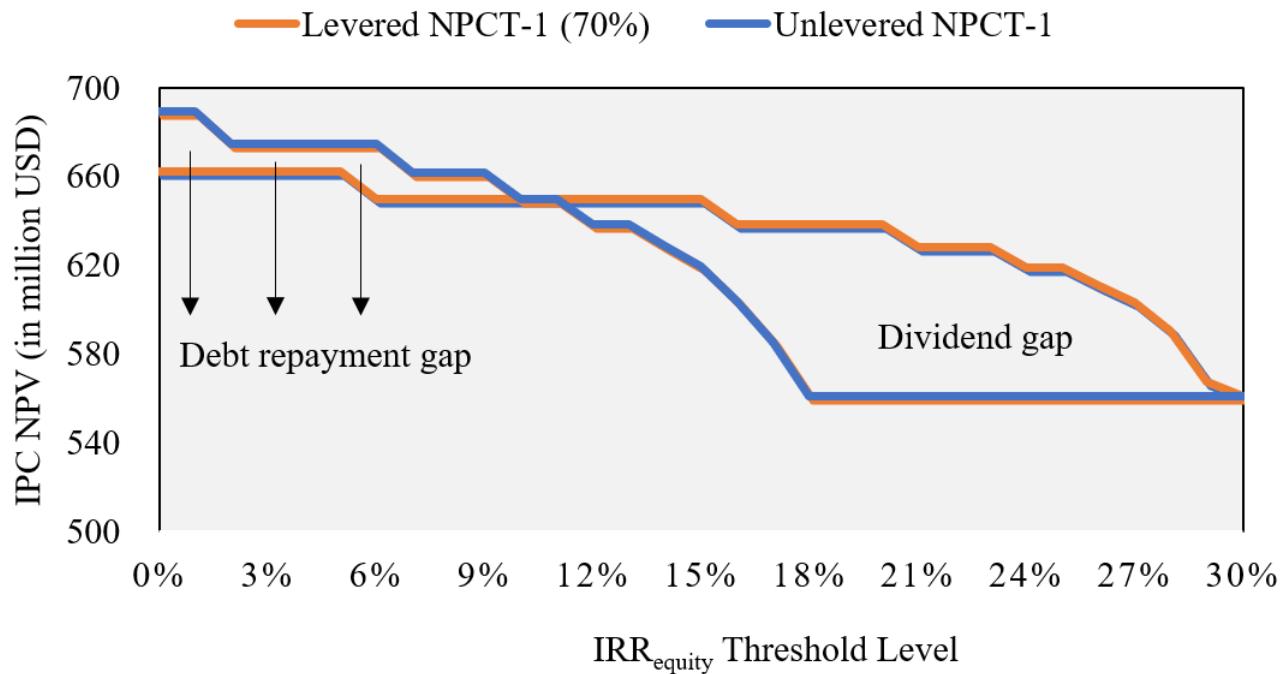


Fig. 5. The project value under the different  $IRR_{equity}$  threshold

levels of  $IRR_{equity}$  threshold, the dividend payments received by the unlevered project company get diminished earlier than the levered project company, as the levered project company would achieve higher IRR at earlier periods, creating a gap that we call the “dividend gap”. Furthermore, as simulated in Figure 5, when the  $IRR_{equity}$  threshold level is at 10–11%, both the levered and the unlevered project company offer more or less the same level of NPV to IPC.

## V. CONCLUSION

Indonesia has become one of the countries that currently witness the rise of its seaport infrastructure development. There are many choices of financing method alternatives to finance infrastructure projects. The purpose of this paper is to understand these alternatives and what they have to offer to attract more investments in seaport infrastructure projects development.

Our survey finds that the respondents expect domestic banking as one of the main financing sources of seaport infrastructure investments. The respondents find that the public-private partnership (PPP)-based financing structure may be effective for seaport investments. These views might come from the incentives arising from the government fiscal supports related to PPP deals.

We conducted a case study of the NPCT-1. We simulate the project value from the perspective of PT Pelabuhan Indonesia II (IPC), as the project sponsor, under different scenario and assumptions. The first scenario is the existing financing structure of the project and the other scenario is the project-finance-based scenario. The simulation model illustrates how a project finance structure might add value to the existing

financing arrangement. A higher project company leverage would lower the total equity contribution. A lower equity contribution means that a higher  $IRR_{equity}$  can be achieved at an earlier period than if the project company is unlevered.

There are two main limitations of this study. The first limitation, regarding the survey analysis, is the small number of respondents. Second, the simulation model that we build is constructed with some simplifying assumptions. Despite that a large number of respondents and highly accurate assumptions is not necessary for this study, there are possible future research by adding these aspects into the research approach for other research objectives, for example, to test whether the respondents’ background (such as industry, private or public sector, education, experience) would affect their views on the various financing methods. Future research approach can also benefit from utilizing more advanced analyses, such as real-option analysis, to illustrate how project management decision during the project operation may provide significant benefits for the project sponsors.

## VI. ACKNOWLEDGMENTS

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