The role funding based non cash loan in the form of supply chain financing on elevated road project performance (case study join operation project PT.X)

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Abstract. Indonesia infrastructure road development in recent years has experienced a very significant increase, but in its implementation the issue of land acquisition and limited funding are the main problem in realizing this development. Elevated Road Project is one of the way to minimize the effect land acquisition, and also Joint operation (JO) and applying Non Cash Loan (NCL) at the form Supply Chain Financing (SCF) in project can have good performance effect that can be see positif Project Cash Flow (PCF). Supply Chain Financing (SCF) is a financial instrument issued by financial institutions with various terms and conditions applicable to a supply chain that occurs between buyers and sellers, which aims to optimize the management of working capital and company liquidity. However, the selection of the SCF financing scheme also has a weakness where there is a cost of money that must be spent in the process. The purpose of this study was to determine the NCF SCF Cost Structure and evaluate the implementation of the use of SCF facilities on the elevated road project performance with a JO project case study at PT.X. Research methodology using survey and project cases study, while for the conducted to determine cost structure using statistical descriptive analysis. This study produce cost structure table which is majority for material, equipment, and sub contractor can be implemented using NCL SCF, also implementation procurement procedure using SCF until invoicing.

1. Introduction

Indonesia has a tremendous number of islands and population. The government has to build many infrastructures such as many harbour, not only sea harbours in every island but also airports to connect the regions and economics centre of the country. Indonesia has to increase and extend roadway, toll road, elevated-road which are connecting between cities and villages to the border area of Indonesia (source : kppip,2017). According to Directorate General of State Assets, Finance Ministry of the Republic Indonesia’s data, there are problems to build the infrastructures. The main problem of infrastructure development is land problem or land acquisition at 44% which is affect next phase of development (table 1). The others problems are inadequate and long-grawn planning and preparation at 25 %, followed by funding limitations problem at 17 % and licensing problem at 12%. Therefore, According to data from Toll Road Regulatory Agency (BPJT) and Diractorate General of Highways in the Ministry of Public Works and Public Housing that one of infrastructure development which growing rapidly is elevated-road infrastructure development. Because, It can be done on a trace Right of Way (ROW) of an existing road. It will minimize land acquisition for the infrastructure development (BPJT, 2016).
In funding limitation problem of infrastructure development, According to Committee for the Acceleration of Priority Infrastructure Provision (KPPIP), Coordinating Ministry for Economic Affairs’ data that Government of Indonesia has 222 National Strategic Project (PSN) and 3 additional program whose investment needs are estimated to reach Rp. 4.092 trillion. It is budgeted from APBN at Rp 423 trillion, Rp 1.255 trillion from BUMN and BUMD, the rest is budgeted from private sector investment at Rp 2.414 trillion. The role of BUMN, BUMD and Private sector are very dominant for infrastructure development. Therefore, the government of Indonesia through KPPIP encourages private sector to support infrastructure development in Indonesia by providing some funding schemes such as funding schemes for Government Cooperation with Business Entities (KPBU), Public Private Partnership (PPP) and Non APBN Infrastructure Financing (PINA). KPBU as one of reliable scheme to pursue infrastructure development in Indonesia is a provision and funding scheme infrastructure development based on a contract between Government represented by Minister/Head of Institution/Regional Government as Person in Charge of Cooperation Projects (PJPK) and private sector or business entity by taking into account the principle of risk sharing between the parties.

However, KPBU scheme will emerge a new problem for business entity, namely working capital will increased significantly. It cause the debt obligation increase and generate higher Debt to Equity Ratio (DER). According to Global Rating Agency’s data, Moody's Investor Service (moody's) which was reported on CNBC Indonesia mentions growth in debt of business entities increased significantly and at high risk in last five years since infrastructure project become mainstay project for Government (table 1). Therefore, Working Capital Management (WCM) and Financial Flow become the critical working strategy for state owned construction company (BUMN Karya) to maintain growth and liquidity of company with apply Non Cash Loan system based on Supply Chain Financing. Moreover, Joint Operation (KSO) form believed to be able to help sharing working capital that occurs in the implementation of infrastructure project, especially elevated-road.

Table 1. Debt Equity Ratio (DER) BUMN Karya 2014 – 2019 [1].

| No. | Emiten Code | Debt Amount 2014* | Debt Amount 2019* | Debt Deviation (%) | DER Ratio 2014 | DER Ratio 2019 |
|-----|-------------|-------------------|-------------------|--------------------|----------------|----------------|
| 1.  | ADHI        | 8,70              | 25,00             | 187,30             | 4,97           | 3,92           |
| 2.  | JSMR        | 20,80             | 68,30             | 234,3              | 1,79           | 3,20           |
| 3.  | PTPP        | 12,20             | 37,10             | 203,6              | 5,11           | 2,26           |
| 4.  | WIKA        | 10,90             | 41,80             | 282,5              | 2,20           | 2,35           |
| 5.  | WSKT        | 9,70              | 103,70            | 970,00             | 3,40           | 3,59           |

*Rp. In Triliun

PT. X, one of state owned construction company (BUMN Karya) who play an active role supporting government programs in advancing national infrastructure. PT. X implementing various national strategic project and other projects using diference funding scheme in accordance with the payment scheme offered by the owner. It has an impact on working capital needs and company liquidity. PT. X applying a policy, assign payment methods to third parties (sub-contractor and vendor) by using a Non Cash Loan (NCL) atau Non Tunai methods based on Supply Chain Financing (SCF) as one of action to maintain working capital balance and extend the maturity period of the debt. Figure 1 shows comparison of the use of Plafon of Cash Loan and Non Cash Loan in PT. X, Non Cash Loan (NCL) payment become
dominant or majority corporately. In this research, we investigate the implementation strategies *Cash Loan* (NCL) SCF which impact Project Cash Flow (PCF) in elevated-road infrastructure project. In order to find the implementation strategies, we first identify identifying the cost component of the construction project that can be implemented in the Non Cash Loan process based on Supply Chain Financing (SCF).

![Graph showing cash and non-cash loan data for 2019](image)

*Rp. In Miliar

**Figure 1.** Data plafon cash loan dan non cash loan pada PT.X [2]

2. **Literature Review**

2.1 *Supply Chain Management* (SCM)

Some literature say Supply Chain Financing as part of Supply Chain Management because it is one of supply chain part. According to Chopra dan Meindl (2007), Supply Chain Management is supply chain including whole parts such as produsen, distributor dan customer in directly and/or indirectly in order to fulfill customer demand. Supply chain encompasses not only producer and suppliers but also distributors, warehouses, retailers and the customers them self.

2.2 *Working Capital Management* (WCM)

From accounting viewpoint, Sanders (2006) says working capital as “discrepancy between short term asset and short term obligation. Whereas, Cronie (2008) says working capital as “cash amount which is required by company to fund discrepancy between payment and collection”. Cronie was criticized by Van Thienen (2011), He argued that working capital is business liquidity which required for operational days.

2.3 *Supply Chain Financing* (SCF)

Supply Chain Financing definition from some literature are:

- An approach for two or more organizations in a supply chain, including external service providers, to jointly create value through means of planning, steering, and controlling the flow of financial resources on an inter-organizational level (Hofmann, 2005).
- A combination of trade financing provided by a financial institution, a third party vendor, or a corporation itself, and a technology platform that unites trading partner and financial institutions
electronically and provides the financing triggers based on the occurrence of one or several supply chain events (Aberdeen Group, 2006).

➢ Optimizing the financial structure and the cash-flow within the supply chain can be named SCF (Supply Chain Finance) (Moritz Leon Gomm, 2010).

➢ Supply Chain Finance (SCF) can be defined as the use of financial instruments, practices and technologies for optimizing the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners – the buyer, the supplier and the financing institution (EBA, 2014).

However, we define Supply Chain Financing (SCF) as financial instruments issued by financial institutions with various terms and conditions apply in a supply chain between buyer and seller. It purposed to optimizing working capital management and company liquidity. From definition above, we can figure the parties involved SCF process such as financial institutions (Bank or other financial institutions), buyer, seller and supplier in a pyramid diagram below.

![SCF Pyramid](image)

**Figure 2. SCF Pyramid [3].**

The explanations of this SCF pyramid as a simple picture of SCF proces are showed below:

**Financial Institutions**

This financial institutions is Banking parties. The Banking parties provide plafon of credit facilities to buyer with terms and conditions apply. It provided with non cash form for buyer because the banking parties will transfer it to supplier as a payment of working invoice of supplier to buyer directly. Non-cash credit will be paid by the buyer to bank in a certain time period in accordance the maturity agreement.

**Buyer**

*Buyer* is a contractor who gain SCF facilities or credit recepient from financial institution parties or Banking parties. Whereas, contractor as credit recipient is not gain the credit on cash directly because banking will distribute the approved credit to supplier as payment form from contractor to supplier. The Bank will provide cost of money accordance to the maturity period agreement between the contractor and the Bank because of its credit transaction. The contractor will pay the credit on the maturity period to The Bank.

**Supplier**

Supplier is sub-contractor or vendor or foreman, the parties who make agreement with a contractor to execute a certain work. Sub-contractor will implement the obligation accordance to the contract
between sub-contractor and contractor. After completing the works, the sub-contractor can collect the payment of the works from contractor. The billing will be verified and approved by contractor and distribute to the Bank. If the billing approved by the contractor, the Bank will receive the billing from the sub-contractor to make payment from the Bank to sub-contractor account.

**SCF Instrument**

SCF instrument is factors which part of terms or conditions in SCF pyramid cycle as follows:

- **Working capital company.** It will determine how big the credit plafon for SCF process.
- **Discount rate per year.** It is part of cost of money which happen because of SCF process. Discount rate value is various depend on agreement between the Bank and contractor. Discount rate range is 7% - 10 %.
- **Outstanding duration.** Generaly outstanding duration offer is 30 days/60 days/90 days/180 days.
- **Administrative document.** It is requirement that must be met by all third parties (The Bank, Contractor and Sub-contractor). These administrative requirements are various depend on company policy. Basically, the requirement that should be completed are eligible, contract between Contractor and Sub-contractor, completion work, employment report and SCF approval letter.

Key of perform indicator which include for SCF financial flow are (Hausman, 2003) :

- **Days of working capital (DWC)**
  A time to collect company working capital. SCF lengthen company DWC indirectly. So that, it can be used to gain other investment opportunities.

- **Days of sales outstanding (DSO)**
  A duration between sales of goods and invoice to customers and actual payment date from customers.

- **Days of inventory (DIO)**
  A duration between delivery of goods with invoice from Sub-contractor and goods sales with invoice to customer. It shows average number of items amount per day in supply before sale by company. It is the focus of whole activity in classic supply chain management.

- **Days payables outstanding (DPO)**
  A duration between goods sales, invoice to customer and expectation payment date. Indicator of Days payables outstanding is similar with Days of sales outstanding. It shows the average time of credit outstanding in units of days. The best DSO is duration of long due because the company will collect all credit before due date.

### 3. Research Metodology

This research is a qualitative study using literature studies, expert judgment, surveys, descriptive analysis and case studies used to answer each research question. The case study in this research was carried out on the 9 km KSO elevated road project which is located across Jakarta. There are 6 variable to be studied cash in, cash out, progress, procurement procedure, invoicing procedure and cost of money invoicing procedure.

**Table 2.** Variable, sub variable and indicator.

| Variable   | Sub Variable          | Indicator                                |
|------------|-----------------------|------------------------------------------|
| 1. Cash In | Cash In               | 1. Advanced Payment                      |
|            |                       | 2. Term Payment                          |
|            |                       | 3. Paid up capital                        |
|            |                       | 4. Asset Sales                           |
| 2. Cash Out| Direct costs for wages| 1. Foreman's wage costs                  |
|            |                       | 2. Daily Labor Wage Costs                |
|            |                       | 3. Wage Mobilization Costs               |
|            | Direct Cost of Material| 1. Ready mix material                    |
|            |                       | 2. Steel Rebar material                  |
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Variable | Sub Variable | Indicator
---|---|---
Direct Cost of Equipment | 1. Service Crane | 3. Etc
2. Manlift | | |
3. Etc | | |
Direct Cost of Subcontractor | 1. Bore Pile Subcontractor | |
2. Erection Subcontractor | | |
3. Stressing Subcontractor | | |
4. Etc | | |
Indirect Cost | 1. Overhead | |
2. Insurance | | |
3. Cost of Money SCF | | |
4. Etc | | |
Project Profit | 1. Profit | |
3. Progress | Owner | |
Owner | 1. Term of payment | |
2. Collection Period Owner | | |
3. Outstanding Payment Owner | | |
Third Party | 1. Collection Period Third Party | |
2. Outstanding Payment Third Party | | |
4. Procurement | Procedure | |
Procedure | 1. Review Contract Document | |
2. Technical Specification Document | | |
3. Etc | | |
5. Invoicing | Procedure | |
Procedure | 1. Progress Submission | |
2. Approval Progress Submission | | |
3. Etc | | |
6. Cost of money | invoice procedure | |
invoice procedure | 1. Approval payment | |
4. Finding and Discussions

4.1. Cost Structure
Survey was conducted by expert and also the respondent was choose the person who involve and have experience related with Non Cash Loan based on Supply Chain Financing (SCF). The results of survey for cost structure component of the construction project that can be implemented in the Non Cash Loan process based on Supply Chain Financing (SCF) are:

Table 3. Summary cost structure.

| Variable | Sub Variable | Results |
|---|---|---|
| 1. Cash In | Cash In | Can’t be implemented in SCF |
| 2. Cash Out | Direct costs for wages | Cost structure in SCF except daily worker. |
| | Direct Cost of Material | Cost structure in SCF |
| | Direct Cost of Equipment | Cost structure in SCF |
| | Direct Cost of Subcontractor | Cost structure in SCF |
| | Indirect Cost | Can’t be implemented in SCF |
| | Project Profit | Can’t be implemented in SCF |
| 3. Progress | Owner | Cost structure in SCF |
| | Third Party | Cost structure in SCF |
4.2. Implementation strategies SCF

1. Procurement SCF Procedure
   Based on the survey result variable X4. Procurement SCF Procedure are:

   **Table 4. Procurement SCF Procedure.**

2. Invoicing SCF Procedure
   Based on the survey result variable X5. Invoicing SCF Procedure are:
3. Invoicing Interest SCF Procedure
Based on the survey result variable X6. Invoicing Interest SCF Procedure are:
Table 6. Invoicing Interest SCF Procedure.

4.3. Interview Result
There are 4 question in interview form for respondent to be answer and summary the result are:

Table 7. Interview Result.

| No. | Question                                                                 | Days     | Results   |
|-----|--------------------------------------------------------------------------|----------|-----------|
| Q1  | How many days ideal for Days Sales Outstanding (DSO) from owner to contractor | 14 days  | 16,00%    |
|     |                                                                          | 30 days  | 52,00%    |
|     |                                                                          | 45 days  | 12,00%    |
|     |                                                                          | 60 days  | 4,00%     |
|     |                                                                          | 90 days  | 12,00%    |
|     |                                                                          | 180 days | 4,00%     |
| Q2  | How many days ideal for Days Payable Outstanding (DPO) from contractor to third party. | 14 days  | 4,00%     |
|     |                                                                          | 30 days  | 20,00%    |
|     |                                                                          | 45 days  | 32,00%    |
|     |                                                                          | 60 days  | 24,00%    |
|     |                                                                          | 75 days  | 4,00%     |
|     |                                                                          | 90 days  | 8,00%     |
|     |                                                                          | 180 days | 8,00%     |
| Q3  | Can the Supply Chain Financing (NCF) Non Cash Loan (NCL) financing method increase the working capital of the construction project | Yes it can | 92,59%    |
| Q4  | Can the Supply Chain Financing (SCF) Non Cash Loan (NCL) financing method improve the performance of the project's financial cash flow or Project Cash Flow (PCF) into Positive Cash Flow Nett | Yes it can | 96,30%    |
From table Q1 for Days Sales Outstanding (DSO) majority respondent choose 30 days, Q2 for Days Payable Outstanding (DPO) majority respondent choose 45 days. For Q3 majority respondent agree that NCL can increase working capital of construction project. And for Q4 majority respondent also agree that NCL SCF can improve the performance of the financial Project Cash Flow (PCF) into positif PCF.

4.4. Case Study Project Cash Flow (PCF)
Case Study for the project Joint Operation was elevated toll road along 9.3 KM in Jakarta. Total amount for this project around IDR 2,8 Trillion, one of the project charter that must be done in this project was investment construction equipment for a long term purpose.

This table was cost breakdown and estimating for this project, simulation overdraft cashflow with or without SCF.

| No. | DESCRIPTION                                                                 | TOTAL COST | COST WITHOUT SCF | COST WITH SCF | PERCENTAGE |
|-----|-----------------------------------------------------------------------------|------------|-----------------|--------------|------------|
| 1   | CASH IN                                                                     |            |                  |              |            |
|     | **a** Cash In from Progress                                                 |            |                  |              |            |
|     | - Advance Payment                                                           | 236,138,084,534,46 | 236,138,084,534,46 | 10,00%       |
|     | - Monthly Payment                                                           | 2,609,120,160,000,00 | 2,609,120,160,000,00 | 100,00%     |
|     | - Advance Money Return                                                      | (236,138,084,534,46) | (236,138,084,534,46) | 15,00%       |
|     | - Cut Retention                                                             | (45,659,602,800,00) | (45,659,602,800,00) | 5,00%        |
|     | - Payment Retention                                                         | 45,659,602,800,00 | 45,659,602,800,00  | 5,00%        |
|     | - Tax PPN                                                                   | 260,912,016,000,00 | 260,912,016,000,00 | 10,00%       |
|     | - Tax PPh 3%                                                                | (78,273,604,800,00) | (78,273,604,800,00) | 3,00%        |
|     | **b** Cash In from SCF                                                      |            |                  |              |            |
|     | PT. Y                                                                       | 943,790,546,201,16 |
|     | PT. X                                                                       | 542,137,564,836,74 |
|     | Asset Sales                                                                 | 304,695,748,018,00 | 304,695,748,018,00 |            |
|     | **COMULATIVE TOTAL CASH IN**                                                | 2,791,758,571,200,00 | 4,277,686,682,237,90 |            |
| 2   | CASH OUT                                                                    |            |                  |              |            |
|     | **a** Cash Out                                                              |            |                  |              |            |
|     | - Wages                                                                     | 102,751,496,873,51 | 102,751,496,873,51 | 3,94%        |
|     | - Material                                                                  | 831,190,023,205,70 | 831,190,023,205,70 | 31,86%       |
|     | - Equipment & Heavy Duty                                                    | 259,282,517,270,28 | 259,282,517,270,28 | 9,94%        |
|     | - Subcontractor                                                             | 859,432,565,387,03 | 859,432,565,387,03 | 32,94%       |
|     | - Operational Cost                                                          | 75,639,970,629,00 | 75,639,970,629,00  | 2,90%        |
|     | - Over Head                                                                 | 129,454,860,790,33 | 129,454,860,790,33 | 4,96%        |
|     | - Insurance and Guarantee                                                   | 11,164,360,580,00 | 11,164,360,580,00  | 0,43%        |
|     | - Design Cost                                                               | 50,045,619,392,48 | 50,045,619,392,48  | 1,92%        |
|     | - Equipment Investment (Owning Cost)                                        | 133,345,060,324,31 | 133,345,060,324,31 | 5,11%        |
|     | - Cost of Money                                                             | -           | 66,625,391,207,89 | 2,55%        |
|     | - PPN                                                                       | 260,912,016,000,00 | 260,912,016,000,00 | 10,00%       |
|     | - Equipment Investment (Residual Value)                                     | 304,695,748,018,00 | 304,695,748,018,00 | 11,68%       |
|     | **b** SCF Return                                                            |            |                  |              |            |
|     | PT. Y                                                                       | -           | 943,790,546,201,16 |
|     | PT. X                                                                       | -           | 542,137,564,836,74 |
The result show without NCL SCF profit could be increase significantly better than with NCL SCF because cost of money for SCF. The weakness without NCL SCF Project Cash Flow (PCF) had negative during project, PCF had better performance if with NCL SCF.

Figure 3. Shows overdraft cashflow without SCF.

The figure 3 bove explain negative cash flow in the current month. Red curve show cash out position during project and blue chart shows income or cash in position during project. Overdraft cashflow show without SCF red curve shows greater than blue chart. It mean cash out bigger than cash in during project. The figure 4 explain overdraft cashflow with SCF have positif cash flow during project. Blue chart or cash in are bigger than red curve it mean cash in bigger than cash out.
Figure 4. Shows overdraft cashflow without SCF.

5. Conclusion
This paper discuss an effort to identify the cost structure NCL SCF and the strategy implementation NCL SCF that would be influenced Project Cash Flow on joint operation elevated toll road project. There are some point that could be conclude form this paper:
1. Mostly all variable cost in elevated toll road project could become cost factor for NCL SCF except Cash in, Direct cost and Profit.
2. Strategy implementation for NCL SCF could be develop in procurement procedure, invoice procedure and invoice interest procedure.
3. Ideal Days Sales Outstanding (DSO) are 30 days and ideal for Days Payable Outstanding (DPO) are 45 days. NCL can increase working capital of construction project and also NCL SCF can improve the performance of the financial Project Cash Flow (PCF) into positif cash flow.
4. NCL SCF could improve Project Cash Flow or Overdraft Cash Flow into positive.

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