

# A Methodology to Evaluate Fiscal Incentives for Promoting Investment of Pioneer Industries: A Case Study

Nur Atikah, Muhammad Hisjam, Wahyudi Sutopo, Lila H. Bakhtiar

**Abstract**— The fiscal incentives are one way that has been actively applied in developed and developing countries in an effort to develop the industrial sector. Indonesia became one of the countries that implement fiscal incentives, one of which is a tax holiday. This fiscal incentive is expected to boost investments in infrastructure, attract increased numbers of foreign investors, and ramp up resource based manufacturing industries. The Minister of Industry and Indonesian Investment Coordinating Board (BKPM), as the government institutions that evaluate and have the authority to provide recommendations on the realization of any proposal fiscal incentives, recommendations on the length of the implementation of the tax exemption becomes important to be attentive. The financial statements for seven scenarios are approached to examine the relationships between investment returns with the different period of the tax exemptions. This recommendation on how long a corporate taxpayer shall be granted an exemption of their corporate income tax has been done.

**Index Terms**—evaluate fiscal incentives, financial analysis, oleo-chemicals industries, tax holiday.

## I. INTRODUCTION

MOST developing country, are competing with each other to make their country an attractive destination for private capital inflows to develop industry. To attract private sector, the fiscal incentive is one way that has been actively applied in developed and developing countries [1]. Indonesia became one of the countries that implement fiscal incentives in an effort to accelerate and expand the Indonesian Economic Development in industrial sectors, one of which is tax holiday [2]–[4]. The tax holiday is a one of fiscal policies that provides facilities taxation of corporate income tax exemption for a certain period. Issuance of this policy is required to promote investments in infrastructure, attract increased numbers of foreign investors, and ramp up resource based on manufacturing industries [4]. As in the Finance Minister Regulation (FMR) No. 130/PMK.011/2011 on the Facilitation of Exemption or Deduction of Corporate Income Tax, tax holiday facilitate

corporate income tax exemption will be given to businesses in “pioneering industries” for 5 up to 10 years starting from the year tax on the corporate taxpayer’s production as in [5]. The corporate taxpayer is in the pioneer industry such as basic metals industry, petroleum refining and / or chemical base derived from petroleum and natural gas, which is engaged in industrial machinery, industrial engaged in the field of renewable resources, and/ or communications equipment industry [5], [6].

The chemical industry based derived from palm oil (oleo-chemical) is one of the pioneer industries that are the focus of the industrial development roadmap of the Directorate General of Agro Industry – The Industry Ministry. The palm oil processing industries (crude palm oil derivative) are one of the priorities developed because Indonesia is one of the world’s largest producers of crude palm oil (CPO & CPKO). In addition the palm oil processing industries have a higher

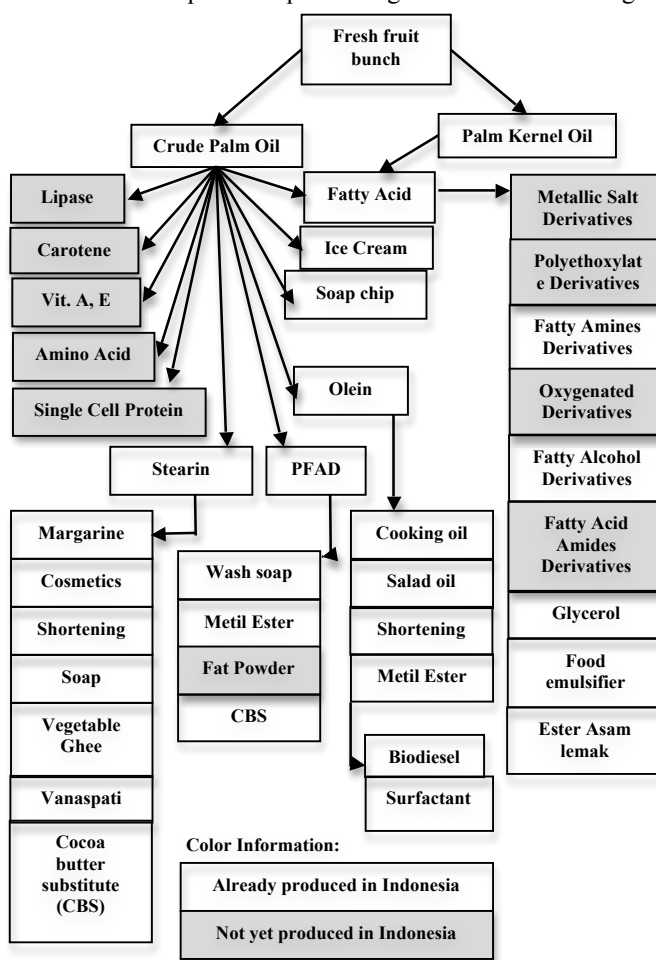


Fig. 1. The tree downstream palm oil industry. There are some many derived product based on the palm oil processing industries which has not been produced in Indonesia (the renewable products). A company that can produce the renewable products that are targeted by the holder of the tax holiday. [7]

N. Atikah is Assistant of Logistic Systems and Business laboratory, Department of Industrial Engineering, Sebelas Maret University, Surakarta, 57126, Indonesia. (phone: +685642342949; e-mail: wahyudisutopo@gmail.com;).

M. Hisjam, and W. Sutopo are with the Laboratory of Logistic Systems and Business, Department of Industrial Engineering, Sebelas Maret University, Surakarta, 57126, Indonesia. (e-mail: mhisjam@yahoo.com; wahyudisutopo@gmail.com;).

L. H. Bakhtiar is with the Directorate General of Agro Industry, The Ministry of Industry, Jakarta, 12950, Indonesia. (e-mail: lila\_harsyah\_b@yahoo.co.id)

added value, which can be seen from the tree downstream palm oil industry as in Fig. 1, and over the processing of these commodities can eradicate poverty among small holders 1.75 million households, the source income and employment for 3.27 million people [2], [8]. The chemical industry based derived from palm oil, which can be classified as an industry pioneer company that can produce renewable products (products that have not yet produced in Indonesia) as Fig. 1. The level of the pioneers of an investment is also influenced by the presence or absence of the use of renewable technologies, the market size, externalities levels and others [9].

## II. THE TAX HOLIDAY SCHEME

The taxpayer company, which is the pioneer industry can submit a tax holiday proposal to the Ministry of Industry and will be forwarded to the Director General of Industrial Management, which would be examined by the Finance Ministry as a decision maker. The proposal usually covers executive summary, a description of the inherent aspects of the pioneer, the impact of investments in the country, financial analysis, project planning and legal compliance [9]. From the proposal, the availability of infrastructure in the proposed investment locations, the absorption of the domestic employment, compliances the criteria of industry pioneer, and others, are aspects that should be investigated by the ministry of industry before give a recommendation on whether or not a corporate taxpayer shall be granted an exemption or reduction of their corporate income tax to the Minister of Finance [6]. One of the worth provisions under the Tax Holiday Regulation is the provision that administers the possibility to extend the period of tax exemption or deduction [6]. This provision entails two elements to be regarded, which are the fact that national competition needs to be maintained and an evaluation of the strategic value of a particular business [4]. For evaluation of the strategic value of a particular business, financial analysis may be one approach to the study [10], [11]. To evaluate the value of a particular business, the tax holiday scheme needs to be defined previously in order to know what aspects should be considered. Fig. 2 is a schematic that describes the implementation of the tax holiday.

In fig. 2 seen that in the first  $k$ -years the company is in the engineering, procurement, construction (EPC) phase, then

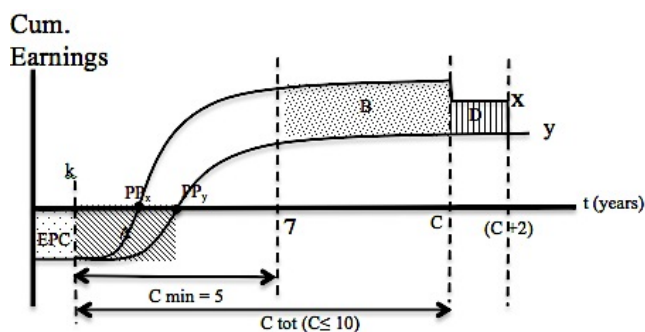


Fig. 2. The schematic of implementation of tax holiday. The relationship between earnings and periods reflected in the time horizon, where the image is compared with company's revenue with tax exemption (x) and without the tax exemption (y).

enter a period of profit-making commercial sales (A). At this time when earnings of each period are positive the company has been obliged to pay corporate tax and tax holiday when it is also implemented. The minimum implementation of the tax holiday period has been for 5 years in denote as C min. For the maximum the length of tax holiday periods (C tot), the tax holiday proceeds according to the decision that was decided by the finance ministry recommended by the Ministry of industry, maximum until 10 years. After the length of implementation of tax holiday expired, the corporate taxpayer is given the facilities of corporate tax reduction by 50% in 2 years (denote as D). Then after that the corporate taxpayer have obligated to pay 100% of the tax rate fare [5], [6].

In an effort to assist the ministry of industry to provide recommendations, researchers intend to formulate a methodology that can identify several characteristics that must be considered in evaluating proposals from a financial point of view. The first methodology is the characteristic of the investment. The items that make up the large investment must be considered to be able to see and measure the value of the strategic value of the business. The seconds is determines the length of EPC phase. By determining the length of EPC phase; the Ministry of Industry would determine when the tax exemption would be started. The thirds are what the elements that constructing cash flows of this investment. By knowing the constituent elements of cash flow on investment, the administrator may determine the amount of benefit that may be gained by the taxpayer company and can evaluate the financial projections in the tax holiday proposal. The last is how to define the tax holiday periods. By determining this period, the ministry of industry can recommend a period of tax exemption based on analysis the strategic value of the particular business. The decision must be feasible and attractive from an investor's point of view and does not eliminate the government's opportunity too large of tax revenue.

## III. METHODOLOGY

This research proposes a methodology based on the collecting and processing of primary and secondary data. From the methodology established, this study makes a simulation using a financial analysis approach to evaluate the strategic value with a case study approach. The simulation of financial statements and feasibility analysis has been done on previous researches to analyze the strategic value of investments [12] -[15]. From the previous research, the decision makers would base their investment decisions on an economic decision model, which is evaluated according to cash flow, discount rate [12], [13]. In addition, given limited resources the cash flow created by tax shield, especially the debt portions, enhances company value, and the influence is greater than that of actual tax-savings and used tax shield value to examine the relationships between hedge returns, interest rate, and investment returns, and use the price differences in these relationships to make investment decisions [14], [15]. Based on the previous research, to evaluate the value of particular business this research was conducted with approaches as shown by Fig. 3. Simulation of financial statements generated from capital and operating expenditures and micro and macroeconomic data, which is related to the

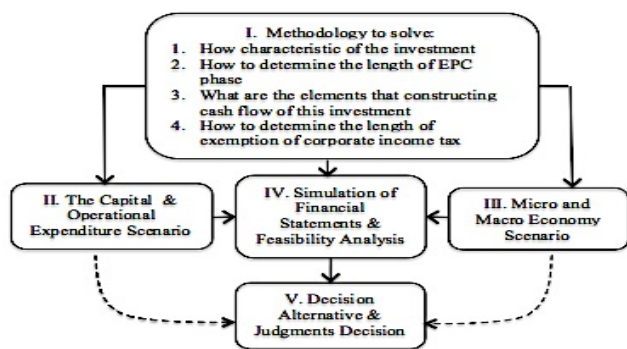


Fig. 3. Methodology Approaches

investment plan from a study case of the oleo-chemical companies that have applied the tax holiday to the ministry of industry. To determine the length of attractive periods of tax holiday implementation for investors from the value of the particular business, researchers simulate financial statement from seven different scenarios, differentiated by the period of implementation of the tax exemption. From the each of the scenarios, feasibility analysis, such as Net Presents Value (NPV), Internal rate of Return (IRR), Payback periods (PP) and Return on Investments (ROI), can be calculated. The decision alternative and judgment decision can be done by comparing the value of the index of feasibility analysis for each scenario with the value of the feasibility index of oleo-chemical industry (cut off values).

#### IV. SOLUTION METHODS

In an effort to assist the ministry of industry to provide recommendations, researchers intend to formulate a methodology from a financial point of view that can identify several characteristics that must be considered in evaluate the tax holiday proposal applications.

##### A. The Characteristic of the Investment

The first methodology is the characteristic of the investment as illustrated in Fig. 4. As seen in Fig. 4 there are two steps that must be done are described the project plan and detail the investment plan. There are three aspects that have to be considered as investment plan detail, namely capital expenditure, operational expenditure, micro and macro economy aspects.

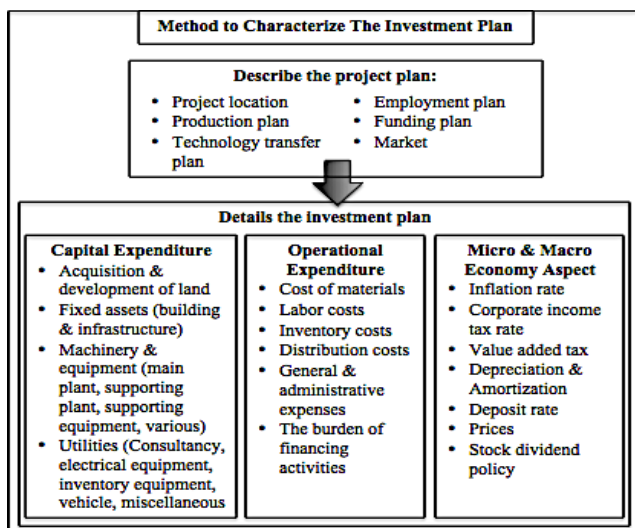


Fig. 4. Methodology to characterize the investment plan.

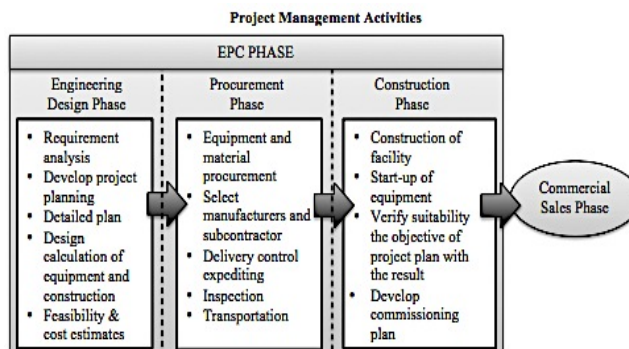


Fig. 5. Project management activities.

##### B. The Length of The EPC Phase

The seconds are a methodology to determine the length EPC phase. The length of the EPC phase can be calculated by knowing the stages of the project activity. The schedule of project activity is illustrated in Fig. 5. The EPC phase consists of engineering design, procurement and construction phase. The first activities are developed project planning, detailed plan, cost estimation and others in the engineering design phase. Then entered the procurement phase that manages the procurement activities of equipment and material, select manufacturer and subcontractor, inspection until transportation of the procurement cycle. The last is construction phase, which is all the works planned during the engineering phase are carried out and all equipment and materials are installed and prepared for the operation of the Plant. At this stage, also do start-up, is the activity to be carried out in order to obtain the required product for the first time, from the beginning process up to the plant performance tests.

##### C. The Elements of Cash Flows

The elements that constructing cash flows of this investment, help the ministry of industry to determine the amount of benefit that may be gained by the taxpayer company by generating the financial projections of the particular business with corporate income tax exemption policy application. The elements of cash flows of this investment are illustrated as in Fig. 6.

##### D. The Length of Corporate Income Tax Exemption

To judge the optimal length of corporate income tax exemption, researchers used a feasibility analysis approach in making a judgment of decision. Because of this decision must be feasible and attractive from an investor's point of view and does not eliminate the government's opportunity too large of tax revenue, decision parameters using the average value of the industry as a cutoff value to decide

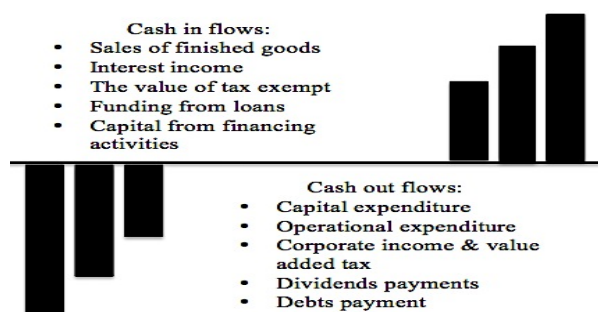


Fig. 6. The elements that constructing cash flows of the particular investments.

whether the investment is feasible of NPV, IRR, PP and ROI. Scenario chosen is the minimum length of the result of simulated values is greater than the cutoff values.

### V. A CASE STUDY AND ANALYSIS

Financial simulation and feasibility analysis was conducted to provide an example of the results of the application of the methodology that was designed before. Simulation is done with data processing of Oleo-Chemicals company as a case study, which was considered to have the ability to reinvest in accordance with the tax holiday.

TABLE I  
INVESTMENT PLAN SCENARIO

| Parameter                                  | Value                              | Source         |
|--|------------------------------------|----------------|
| <b>Investment Plan</b>                     |                                    |                |
| Installed Capacity                         | 138.000 MT                         | Hipotetic data |
| The Project Lifecycle period               | 15 years                           | Hipotetic data |
| Length of EPC phase                        | 2 years                            | Hipotetic data |
| Debt-Equity ratio                          | 30% : 70%                          | Hipotetic data |
| Deposit plan to Indonesian Bank            |                                    |                |
| Nominal of deposit                         | USD 42,900,000                     | Hipotetic data |
| Realization time                           | 2 <sup>nd</sup> years              | Hipotetic data |
| Deposit rate                               | 7%                                 | Hipotetic data |
| <b>Composition of production</b>           |                                    |                |
| <b>Raw Material</b>                        |                                    |                |
| RBDPS                                      | 62%                                | Hipotetic data |
| CPKO                                       | 38%                                | Hipotetic data |
| <b>Finnished goods</b>                     |                                    |                |
| Fatty acid & derivatives                   | 84%                                | Hipotetic data |
| Glycerol                                   | 10%                                | Hipotetic data |
| Byproduct                                  | 6%                                 | Hipotetic data |
| <b>Capital expenditure</b>                 |                                    |                |
| Machinery & equipments                     | USD 32,000,000                     | Calculation    |
| Support equipment & utilities              | USD 38,000,000                     | Calculation    |
| Fixed assets                               | USD 30,000,000                     | Calculation    |
| Working Capital                            | USD 43,000,000                     | Calculation    |
| Operational Expenditure                    | 70% Sales                          | Assumption     |
| <b>Depreciation method (Straight Line)</b> |                                    |                |
| Buildings                                  | 5% /years for 20 economic years    | [16]           |
| machinery & equipments                     | 6.25% /years for 16 economic years | [17]           |
| <b>Micro &amp; macro economy scenario</b>  |                                    |                |
| Utility of Sales                           | 90%                                | Assumption     |
| Inflation rate                             | 6%                                 | [18]           |
| Income tax rate                            | 25%                                | [19]           |
| Commercial bank loan rate                  | 12,20%                             | [20]           |
| <b>Prices</b>                              |                                    |                |
| <b>Raw Material</b>                        |                                    |                |
| RBDPS                                      | USD 674/MT                         | [21]           |
| CPKO                                       | USD 750/Tons                       | [21]           |
| <b>Finnished goods</b>                     |                                    |                |
| Fatty acid & derivatives                   | USD 1361/Tons                      | Hipotetic data |
| Glycerol                                   | USD 625/Tons                       | Hipotetic data |
| Byproduct                                  | USD 197/Tons                       | Hipotetic data |

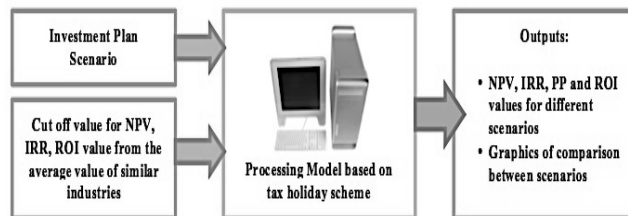


Fig. 7. An application to analyze tax holiday policy scheme with Visual Basic Macro within Microsoft Excel.

#### A. Investment Plan Scenario

In the first phase to assess the strategic value of an investment, over the implementation of the investment program must be determined first. The investment plan data collected such as capital and operational expenditure, micro and macro economy, which is related to the investment plan. The scenarios generated by collecting the secondary data and primary data from the focus group discussion with members of the Director General of Agriculture - the Ministry of Industry Republic of Indonesia. From the primary and secondary data, this study has generated the scenarios as follow in table 1.

#### B. The Simulation of Feasibility Analysis

Simulation of financial statements and feasibility analysis approaches in an effort to evaluate the strategic value of an investment. A simulation was made to create a duplicate of the existing system and so that the system behavior can be studied when given a different input. The simulation was designed in Visual Basic Macro within Microsoft Excel. By using Macro Excel language makes the user can simply modify the program and based on some previous research, this application is commonly used because it is more simple and easier [22] -[26].

Fig. 7 described the operation of the scheme in a simulation to evaluate strategic value. In the presence of input and investment planning cutoff value, simulation processing the model, which is accordance with the tax holiday scheme, related to the business cycle and the constituent elements of the financial statements. After that, the results of that process will get the NPV, IRR, PP and ROI value for each scenario along with graphics comparison as output. There are seven scenarios of financial statements differs based on the period of implementation of the tax exemption has been created. Homepage in the application was shown in Fig. 8. It consists of all investment scenarios,

Fig. 8. Home page of the tax holiday scheme simulation (input data phase before running).

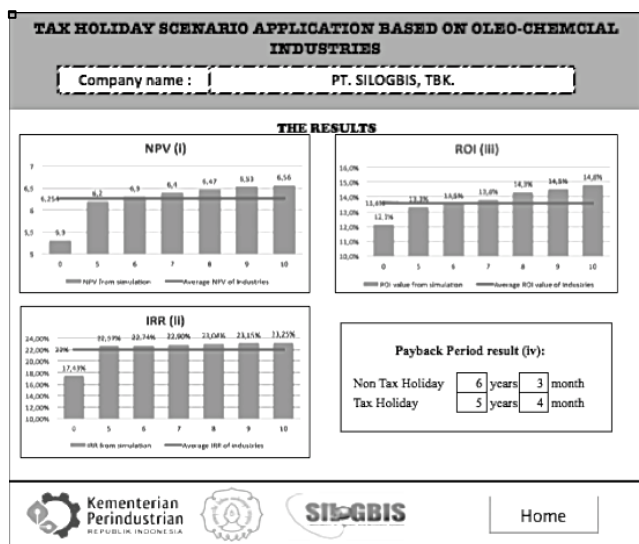


Fig. 9. The result of simulation of financial statements and feasibility analysis

demand projection, and the cutoff value of all feasibility analysis indexes. After all the scenarios are filled, by clicking the “process” button the application will be run. The result of this simulation is illustrated in Fig. 9.

### C. Decision Alternatives and Judgment

Generated from the simulation results that there are five scenarios that can be judged feasible and attractive for the whole entire indicators (NPV, IRR and ROI) as in table 2. The investment is feasible as an indicator of the value of all the simulation results are above the industry average line (cut off value) for the application of the tax holiday scenario with 7 up to 10 years. As a result can be recommended the length of the corporate income tax exemption for 7 years for this investment.

## VI. CONCLUSION AND FUTURE RESEARCH

The methodology to evaluate the fiscal incentive has conducted. There are 4 aspects that must be first identified, such as the characteristic of the investment, the length of EPC phase, the elements that constructing cash flows of this investment and determine the tax holiday periods. Of the 4 proposed methodology, a case study on the application of the oleo-chemical companies have also been implemented. By using software simulation with visual basic macros within Microsoft Excel, the recommendation can be given. The further research can be continued with evaluating other fiscal incentives such deduction of the corporate income tax policy and or develop an application that has been created by adding other decision-making parameters.

### REFERENCES

- [1] Zahir Shah, “Fiscal Incentives, The Cost Of Capital And Foreign Direct Investment In Pakistan: A Neo-Classical Approach”, in *Annual Conference of Pakistan Institute of Development Economics (PIDE)*, 2003.
- [2] The Ministry of Coordinating Economic Affairs the Republic of Indonesia, *The Master Plan For Acceleration And Expansion On Indonesian’s Economic Development (MP3EI)*, Jakarta: the Ministry of Coordinating Economic Affairs the Republic of Indonesia, 2011.
- [3] Deputy Ministry For Infrastructure Affair (Bappenas), “Sustaining Partnership: how and whatsMP3EI”, 2011.

TABLE 2  
RESULT OF FINANCIAL ANALYSIS

| Phase | Result   | Based on                      | Decision   |
|-------|--|-------------------------------|--|
| EPC   | Total Investment = USD 143,000,000<br>Length of EPC phase (k) = 2 years  | Calculation<br>Hypotetic data | No decision  |
| A     | The enter period of profit-making commercials sales = 3rd years<br>Payback Period results; PPx = 6 years 3 months and PPy = 5 years 4 months   | Simulation                    | No decision  |
| B     | Cummulative value of tax exempt for : Scenario 2 ≅ USD 28,178,800<br>Scenario 3 ≅ USD 36,148,100;<br>Scenario 4 ≅ USD 44,584,000;<br>Scenario 5 ≅ USD 53,530,300;<br>Scenario 6 ≅ USD 63,036,000;<br>Scenario 7 ≅ USD 72,611,600   | Simulation                    | No decision  |
| C     | Cut off value for NPV = 6.26 %, IRR = 22%, ROI= 13.6%<br><b>Scenario 1</b> (No exemption of tax) NPV = 5.3, IRR = 17.43%, ROI = 12.1%;<br><b>Scenario 2</b> (tax exemption for 5 years) NPV = 6.2, IRR = 22.57%, ROI = 13.3%;<br><b>Scenario 3</b> (tax exemption for 6 years) NPV = 6.3, IRR = 22.74%, ROI = 13.5%;<br><b>Scenario 4</b> (tax exemption for 7 years) NPV = 6.4, IRR = 22.9%, ROI = 13.8%;<br><b>Scenario 5</b> (tax exemption for 8 years) NPV = 6.47, IRR = 23.04%, ROI = 14.3%;<br><b>Scenario 6</b> (tax exemption for 9 years) NPV = 6.53, IRR = 23.15%, ROI = 14.5%;<br><b>Scenario 7</b> (tax exemption for 10 years) NPV = 6.56, IRR = 23.25%, ROI = 14.8% | Hypotetic data<br>Simulation  | No decision<br>i) The feasible of NPV is on scenarios 3 - 7;<br>ii) The feasible of IRR is on scenarios 2 - 7;<br>iii) The feasible of ROI is on scenarios 4 - 7;<br>iv) 7 years of corporte income tax exemption is optimal length for this investment. |
| D     | Cummulative value of tax exempt (when t= C+2) for :<br>Scenario 2 ≅ USD 8,202,600;<br>Scenario 3 ≅ USD 8,691,100;<br>Scenario 4 ≅ USD 9,226,000;<br>Scenario 5 ≅ USD 9,540,600;<br>Scenario 6 ≅ USD 9,608,300;<br>Scenario 7 ≅ USD 9,671,500   | Simulation                    | No decision  |

- [4] Strategic Asia, ”Implementing Indonesia’s Economic Master Plan (MP3EI): Challenges, Limitations and Corridor Specific Differences”, June 2012.
- [5] The Finance Minister Regulation (FMR) No. 130/PMK.011/2011. Available: [http://www.gbgingonesia.com/en/main/useful\\_resources/documents/regulations/Indonesia%20Income%20Tax%20Relief%20or%20Reduction%20Facilities%20Ministry%20of%20Finance%20Regulation%20No.%20130%20of%202011.pdf](http://www.gbgingonesia.com/en/main/useful_resources/documents/regulations/Indonesia%20Income%20Tax%20Relief%20or%20Reduction%20Facilities%20Ministry%20of%20Finance%20Regulation%20No.%20130%20of%202011.pdf)
- [6] Directorate General of Taxes Republic of Indonesia, *Facilities and incentives Indonesian Income Tax*. Available: “<http://www.pajak.go.id/sites/default/files/Buku%20Fasilitas%20dan%20Insentif%20Pajak-Subdit%20PPH%20Badan%23INDO%20MERAH.pdf>”
- [7] Directorate General of Agro-based Industry, *Bring your investment plan to Indonesian downstream palm oil industry*. 2012
- [8] Presidential Decree, No. 28 of 2008 on the National Industrial Policy.
- [9] Regulation of the Minister of Finance No. 93 year 2011, Available: <http://kemenperin.go.id/artikel/3/Guidelines-and-Procedures-for-Filing-Application-for-Facilities-Exemption-or-Reduction-of-Corporate-Income-Tax-In-Industrial-Sector>

- [10] Fredrik, H., and Karl, R., Evaluating Strategic Value In *Information Systems Development Projects: A case study at SKF*, School of Economics and Commercial Law, ATGÖTEBORG UNIVERSITY, Department of Informatics, 2003.
- [11] The Research Council of Norway, *Evaluation of Added Value and Financial Aspects*, 2010.
- [12] Kahraman, C., Beskese, A., and Ruan, D., "Measuring flexibility of computer integrated manufacturing systems using fuzzy cash flow analysis," *Journal Of Information Sciences*, Vol. 168, no. 1-4, pp. 77-94, 2004.
- [13] Najafi, A. A., and Niaki, S. T. A., "A genetic algorithm for resource investment problem with discounted cash flows," *Applied Mathematics and Computation*, Vol. 183, no. 2, pp. 1057-1070, 2006.
- [14] Fernandez, P., "The value of tax shields is NOT equal to the present value of tax shields," *Journal of Financial Economics*, Vol. 73, no. 1, pp. 145-165, 2004.
- [15] Liu, Y. C., "The slicing approach to valuing tax shields," *Journal of Banking & Finance*, Vol. 33, pp. 1069-1078, 2009.
- [16] Republic Indonesia of Act, No. 10 of 1994 about The Change in Income Tax From the latest with Republic Indonesia of Act No. 7 of 1991.
- [17] Finance of Ministry Decree, No. 96 of 2009 about Types of Property That Belongs To A Group Instead Of Building Tangible Property.
- [18] The Agency For Assessment and Application of Technology (BPPT), *Draft Laporan Akhir Masterplan Kawasan Teknopolitan Kabupaten Pelalawan*, Jakarta: The Agency For Assessment and Application of Technology (BPPT), 2012.
- [19] Finance of Ministry Regulation No. 124/PMK.011/2013 about Reducing The Amount Of Article 25 and Income Tax Payment Delay Of Article 29 For Taxpayer 2013.
- [20] Central Agency on Statistics, 2013. Available: [http://www.bps.go.id/tab\\_sub/view.php?kat=2&tabel=1&daftar=1&id\\_subyek=13&notab=18](http://www.bps.go.id/tab_sub/view.php?kat=2&tabel=1&daftar=1&id_subyek=13&notab=18).
- [21] ICIS, *Mass Balance Product And Price Assumption For Oleo-Chemical Product*, 2012.
- [22] B.F. Telenius, "A software tool for standardized non-destructive biomass estimation in short rotation forestry," *Bio resource Technology*, vol. 60, pp. 267 - 268, 1997.
- [23] A. Kadjo, P. K. Dasgupta, "Tutorial: Simulating chromatography with Microsoft excel macros," *Analytica Chimica Acta*, vol. 773, pp. 1 - 8, 2013.
- [24] J.L.H. Talon, R. G. Marin, C. Garcia, Hernandez, L. B. Muro. C. L. Gomez, J.J.M. Zurdo, J. C. C. Ortega, "Generation of mechanizing trajectories with a minimum number of points," *International Journal of Advanced Manufacturing Technology*, pp. 1 -14, 2013.
- [25] W. McNeely, R. Marlow, N. Rochford, J. Rose, "Use of excel VBA macros in FRANX input database creation,"
- [26] X. Li, T. Cai, "Method of high-precision calculation on the linear parameters for the stay-cable of the cable-stayed bridge," in Proc. CEABM'12, 2012, pp. 2144.