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Competitive Advantage Between Indonesia and Thailand on Electric Vehicle Manufacturing

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Abstract

Indonesia and Thailand engage in the competition of Foreign Direct Investment (FDI) for Electric Vehicle (EV) industry. This study aims to identify determinant factor of FDI in EV industry, analyse the strategy to attract FDI, and see the competitiveness between Indonesia and Thailand in EV manufacturing. Qualitative method used by comparing Indonesia and Thailand through Porter Diamond Model. The model consists of four parts such as factor of conditions; demand conditions; related and supporting business; firm strategy, structure, and rivalry. There are 14 variables inside the four parts to analyse both countries competitiveness through comparing them in every variable. Results indicate that Indonesia has 5 out of 14 variables better Thailand while Thailand has 9 out of 14 variables that is better than Indonesia. Indonesia has the advantage on consumer side due to the possible lower price of EV while Thailand has the advantage on production activities.

Kata kunci:
Investasi Asing, Porter Diamond Model, kendaraan berbasis listrik, Indonesia, Thailand
JEL Classification: F21

Abstrak

Indonesia dan Thailand bersaing dalam mendapatkan investasi asing dalam industry kendaraan berbasis listrik (EV). Penelitian ini bertujuan mengidentifikasi faktor yang mempengaruhi investasi asing di industri EV, menganalisa strategi untuk menarik investasi, dan membandingkan keunggulan kompetitif antara Indonesai dan Thailand di sector manufacturing EV. Dengan menggunakan metode kualitatif yang berdasarkan *Porter Diamond Model*, penelitian ini menganalisa 14 indikator yang selanjutnya digunakan untuk menganalisa keunggulan kompetitif antara kedua negara tersebut. Hasil dari penelitian adalah Indonesia memiliki 5 dari 14 keunggulan indicator dibandingkan Thailand, sedangkan Thailand memiliki 9 dari 14 keunggulan dibandingkan Indonesia. Indonesia sendiri memiliki keunggulan dari sisi konsumen sedangkan Thailand memiliki keunggulan dari sisi produksi EV

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1. Introduction

Foreign Direct Investment (FDI) is one of the sources for developing countries to develop their economy. According to OECD (n.d.), FDI can be a tool for economic development because developing country can get transfer technology, knowledge, skills, managerial market, and access to international market from the investment. FDI will increase the productivity and competitiveness as long as the domestic firms can capture the spill over and indirect effects from FDI itself. Due to its importance, FDI is crucial for every country especially developing country. Therefore, many countries will fight and compete between each other to get FDI inflow to their country in similar sector (Vukšić, 2013, p. 355).

Some countries in Southeast Asia that rely on FDI are Indonesia and Thailand. These two countries are engaging to get FDI in the electric vehicle (EV) industry. EV industry is an industry that has been popular since increasing environmental issues due to air pollution caused by fossil fuels. Many countries are starting to see this industry as a promising industry in the future because of the possibility of depletion of fossil fuels in the future. Indonesia and Thailand both have ambitions to own electric vehicles in the country and become consumers and manufacturer of EV.

Indonesia see that they have a potential to become land of EV in terms of production and consumption. Under President Jokowi's regime, he established Presidential Regulation Number 22/2017 on the National Energy General Plan and Presidential Regulation Number 55/2019 on the Acceleration of the Battery-Based Electric Motor Vehicle Program to strengthen Indonesia manufacture industry especially in EV (Ministry of Administrative and Bureaucratic Reform of the Republic of Indonesia, 2019). Both laws were issued to accelerate the EV program and become the initial foundation in the EV industry in Indonesia. It shows Indonesia's commitment in the development of EV industry.

Meanwhile, Thailand is also trying to engage in the FDI competition for EV industry. According to Thailand's Deputy Minister, Thailand aimed to be EV regional hub for producing EV in the region (Royal Thai Embassy, 2020). Famous as "The Detroit of Southeast Asia", Thailand is very ambitious to continue to maintain that name by transforming its automotive industry to become more advance. Hence, Thailand's government put technology and automotive industry as one of the twelve priority sectors to achieve this dream. Thailand formed the National Electric Vehicle Policy Committee to encourage the development of the automotive industry so that Thailand becomes the centre of EV in Asia in the future (Bangkok Post, 2019). This committee consists of the government and the private sector to develop strategies in developing automotive. This is done to reduce the environmental impact by switching to EV. In addition, Thailand also published a Master Plan for Automotive Industry which contained steps that Thailand had to take to develop an EV.
Looking at the step that has been taken by the two countries, they are very serious in developing this industry. To the develop EV industry, however, these two countries need FDI to reach their national goals. Therefore, this article will explain the competitiveness between Thailand and Indonesia in attracting investment in the EV industry.

2. Literature Review and Hypothesis

Industrialization is considered a single global process where production activities have spread throughout the world (Naudé & Szirmai, 2012, p. 5). Since the industrial revolution began in 18th century in Europe, the manufacturing industry has experienced rapid progress. This industry is appeared in everyday life and encompasses a number of different industries such as in textile, food, chemicals, transportation, machinery,

electronic product, electrical equipment (Naudé & Szirmai, 2012, p. 8; Haraguchi, Cheng, & Smeets, 2016, pp. 10-11; Antonio & Gregory, 2013, p. 8).

The manufacturing industry has a big role to play in increasing the economic growth and it becomes the key sector in many country economies. According to Herman (2016, p. 980) and Eurostat (2017, p. 4), the manufacturing industry create a basis in many national economies that reflected through employment, income, and high share of total output that lead to the sustainable economic growth of the country. The economic growth is increasing due to the high income that coming from the high demand of manufacturing products (Su & Yao, 2016, p. 13). According to the several studies, the manufacturing industry characterized as the tool for country to catch up the development (Kaldor, 1967, p. 45; Felipe, Mehta, & Rhee, 2014, p. 25).

The manufacturing industry is important for the developing country. According to the Kaldor (1967, p. 48), manufacturing industry characterized as the main engine of economic growth and development in developing country. There are three reasons why manufacturing industry can be the engine of growth (Kaldor, 1967, pp. 53-55). First, the GDP growth is directly proportional to the manufacturing industry which is positive. It happens because of the absorption of labour into industrial sector and increase the income. Second, the manufacturing industry productivity is positive with the output of manufacturing industry growth. It happens because there is an increasing output and the size of the industry coupled with the spill over effect obtained while working. Third, the productivity of the non-manufacturing industry is positive with the growth of manufacturing industry. It happens because of the abundance of technology that occurs between the manufacturing industry with others. In addition, the manufacturing industry can bring the export sector higher, pay relatively high labour costs, become a major driver for employment in other sector such as services, and become the major research and development/R&D (Loto, 2012, p. 40). Hence, the manufacturing industry become the driver of productivity growth and technological development.

Due to its benefits, the manufacturing industry is an attraction for policy makers in developing countries. Many national governments put manufacturing industry in their development plans (Felipe, Mehta, & Rhee, 2014, p. 13). The benefits obtained by the country not only used for domestic purposes but also international interest. Goods that produce in manufacturing industry is tradeable in international trade (Hauge & Chang, 2019, p. 28). Goods that produced not only use to fulfil the domestic demand but also national interest. It becomes an additional income for country through export activity. By maintaining a strong manufacturing base at home, the country can succeed in international trade and have a healthy trade balance.

The automotive industry is developing rapidly and continues to increase due to increased community mobility and wider mobility range (Traub-Merz, 2017, p. 29; Szmelter, 2017, p. 165). This industry helps humans to move from one place to another with a shorter time. This causes the industry to become an important part of human life. The automotive industry is also moving in the direction of population growth. When there is an increase in population there will be an increase in mobility and an increase in mobility will increase the productivity of the automotive industry. Hence, many countries develop this industry because of significant growth which can absorb labour and increase economic growth.

EV is part of manufacturing industry in automotive or transportation. The popularity of EV is rising because of environmental issue that come up from the emission of fuel vehicle. To maintain the environment clean and safe, EV become the alternative transportation and hopefully it will become the future of transportation with no emission (Chan, 2013, p. 207). The increasing number of pollutions is rising due to the rising numbers of car and motorcycle in the street. In addition, this is exacerbated using fossil fuel as the main fuel that contributes to pollution levels by producing more emissions. EV is expected to reduce the pollution since it's hard to reduce the number of car or motorcycle.

There are four types of EV. The first type is Battery Electric Vehicle (BEV). BEV is type of EV that use battery as the power of engine (Un-Noor, Padmanaban, Mihet-Popa, Mollah, & Hossain, 2017, p. 3). This type of EV does not produce any greenhouse gas, does not have any noise, and environmentally friendly. Besides that, this

type is suitable for urban areas because of limited coverage. The second type of EV is Hybrid Electric Vehicle (HEV). HEV is the type of EV that use internal combustion engine (ICE) and electrical power train as the power of vehicle (Un-Noor, Padmanaban, Mihet-Popa, Mollah, & Hossain, 2017, p. 4). The electrical power train will be used when the speed of vehicle is low. However, when the speed is high, ICE will be used. In this type, the battery will be charged through ICE. This type of EV is still produced greenhouse gas and not environmentally friendly even though the emission level is not high like traditional vehicle. The third type is Plug-in Hybrid Electric Vehicle (PHEV). PHEV is the type of EV which is similar to HEV (Un-Noor, Padmanaban, Mihet-Popa, Mollah, & Hossain, 2017, p. 6). Where it still uses ICE and electrical power train but also uses electric propulsion as the main power.

A key component part of EV is the battery itself because it is a centre of the EV. There are four types of batteries that are dominant to become EV battery due to its capacity such as lead acid batteries, nickel metal hydride batteries, lithium-ion batteries, and sodium nickel chloride (Andwari, Pesiridis, Rajoo, Martinez-Botas, & Esfahanian, 2017, p. 416; Jussani, Wright, & Ibusuki, 2017, p. 334; Drabik & Rizos, 2018, p. 6). The battery cost, however, is still quite high and it leads to the high price of EV. Therefore, it needs to be further on how to reduce manufacturing costs so that EV becomes more affordable. The most common natural resources that used for EV battery is cobalt, lithium, nickel, manganese, aluminium, and graphite (Elkind, Heller, & Lamm, 2020).

Many countries are interested in developing it in the manufacturing industry (Gissler, Raab, Tix, & Merk, 2016, p. 5). This occurs because the environmental problems that continue to haunt human activities and the availability of fossil fuel are running low. Fossil fuel is categorized as a non-renewable natural resource, can be used up at a certain time, and its use also produces high emissions and causes pollution. It causes the increasing of awareness to improve the environment so that the demand for EV starts to increase every year. In addition, EV research dan development continues to be developed and assisted by large companies such as Tesla, Toyota, Hyundai, Nissan, and Volkswagen make this industry quite attractive (Woodward, 2019, p. 11). Furthermore, natural resources for making batteries are also still abundantly available and can be used to develop better batteries.

3. Data and Method

3. 1. Foreign Direct Investment (FDI)

According to Organisation for Economic Co-operation and Development (OECD), FDI is "*a category of investment that reflects the objective of establishing a lasting interest by a resident enterprise in one economy (direct investor) in an enterprise (direct investment enterprise) that is resident in an economy other than that of the direct investor* (OECD, 2008, p. 7)". FDI is considered important because countries can use it for domestic development amidst changes and development in the world economy (Kukaj & Ahmeti, 2016, pp. 3-4). The knowledge from FDI (DeMello, 1999, p. 140) will contribute to the human capital development in the host country and lead to the better outputs. Furthermore, FDI can promote competition in the domestic market and increase economic growth.
According to Dunning (1998, p. 52), there are four reasons that influence an enterprise or firm's choice for investment such as resource seeking (seek the resources that is not available in the home country or lower cost in the host country such as natural resources and human capital), market seeking (seek for a broader market where the products sold are made in the host country and placed on the local market), efficiency seeking (seek for a more profitable cost base for enterprise operations), and strategic asset seeking (seek for strategic assets that are not available in the home country for a long-term strategy) (Dunning, 1998, p. 54).

There are several determinant factors that can attract FDI, such as natural resources (Asiedu, 2006, p. 70; Ramasamy, Yeung, & Laforet, 2012, p. 21; Frynas & Paulo, 2007, p. 236), market size (Kolstad & Wiig, 2012, p. 31; Asiedu, 2006, p. 74; Chen, Dollar, & Tang, 2018, p. 629), trade openness (Güriş & Gözgör, 2015, p. 54), taxation (Slemrod, 1990, pp. 82-83), human capital (Root & Ahmad, 1979, p. 759; Schneider & Frey, 1985, pp.

171-172; Karimi, Yusop, Hook, & Chin, 2013, p. 18), wage (Calhoun, Yearwood, & Willis, 2002, pp. 15-16), and infrastructure (Vagiatzoglou, 2008, p. 151).

3.2. Competitive Advantage

Competitive advantage is the way a firm can gain a sustainable cost advantage and be able to differentiate itself from its competitors (Porter, 1985, p. 3). Fundamentally, a competitive advantage grows when a firm offers to buyers a lower price and a lower price than its competitors or provides certain unique advantages that more than compensate the higher prices. Besides that, competitive advantage is created and maintained through highly localized process in the home country and further expand internationally (Porter, 1990, p. 40). There are several factors that contribute to competitive success including difference in structure, values, culture, institutions, and national economic history.

According to Michael Porter (1990, p. 73), every nation's competitiveness is depending on how the industry has the capacity to upgrade and innovate. A country should create their prosperity in order to maintain their development in the global competition. In the increasing of global competition between country, competition has shifted more and more to the creation and assimilation of knowledge. It should be noted that, every country has different culture, value, structure, economy, history and they have different way to competitive success. Hence, there is no nation that will be competitive in every industry. A country succeeds in their industries due to their domestic conditions hence creating an attractiveness to the investors.

Every country has different strength in particular industries and the strong industry will create strong firm. In order to reach the competitive advantage, Porter created "The Diamond of National Competitive Advantage" or called Porter Diamond Model (Porter, 1990, p. 78). This model is established to understand the competitive advantage among nations or firm because of their several factors for one national market or even economy over another. Besides that, this model can help to shape the strategy of business to investing in different national markets. There are four points to see the national competitive advantage, such as:

1. Factor Conditions

Factor conditions can be said as the most important points in the model. Factor conditions are points that create by the country itself to gain competitive advantage (Porter, 1990, p. 79). It represents the various types of resources that may or may not available in the country. Besides that, the factor conditions represent the factor of production such as natural resources, labour, land, and capital.

2. Demand Conditions

Demand conditions are the factors that will help the country or firm to create competitive advantage in the market. The strong demand that come within the country itself create a larger market for them and create opportunity to grow (Porter, 1990, p. 82). The country gets their competitive advantage in the market when the demands give them clear image of emerging buyers. Demand conditions can be seen through market size or grow rate of the market.

3. Related and Supporting Industries

Related and supporting industries are referred to the level of success of the firm. The role of related and supporting industries is to advance the innovation process through shared resources (Porter, 1990, pp. 82-83). In addition, this factor can refer to the upstream and downstream that facilitate innovation by exchanging ideas.

4. Firms, Strategy, Structure, and Rivalry

Firm strategy, structure, and rivalry are referred to the how company is created and manage with the attention to the competition that might occur within the industry or other industries (Porter, 1990, p. 83). The purpose is to maintain and improve the competitiveness within the industry.

In order to see the attractiveness and competitive advantage between Indonesia and Thailand, this study will use Porter Diamond Model to analyse it. In addition, this model can explain the factors that can drive the competitiveness and the source to gain the advantage. This model already used in several studies to identify how the industry can be competitive in a country or firm. In this study, the variables in every Porter Diamond Model have been adjusted to the condition in both countries and based on the determinant factor of FDI.

1. Factor Conditions
   a) Labor Wage
   b) Human Capital Index
   c) Industrial Cluster
   d) Government Incentives for EV Consumer
   e) Government Incentives for EV Producer
2. Demand Conditions
   a) GDP Per Capita
   b) Car Density Ratio
   c) Automotive Annual Sale
3. Related Supporting Industries
   a) The Availability of Natural Resources for Battery
   b) Import Tariff on Natural Resources
   c) Import Tariff on Battery
   d) Production Capability of Battery
4. Firm Strategy, Structure, and Rivalry
   a) Ease of Doing Business (EODB)
   b) Saturated Market Level

4. Results

Comparison Between Indonesia and Thailand in the EV Manufacturing Competitiveness

Table 1. Data Comparison Between Indonesia and Thailand

No.	Indicators	Country	
		Indonesia	**Thailand**
1	Labour Wage	• Rp2,263,304 (2018) • RP2,442,769 (2019) = US$ 175.7 2019 = US$ 1 = 13,901 IDR	2018-2019 • Prachinburi = 9540 Baht (US$ 307.2) • Ayutthaya and Nakhon Ratchasima = 9600 Baht (US$ 309.2) • Pathum Thani and Chachoengsao = 9750 Baht (US$ 314) • Chonburi and Rayong = 9900 Baht (US$ 318.8) 2019 = US$ 1= 31.0470 THB

2	Human Capital Index	• 0.53 (2018)	• 0.60 (2018)
3	Economic Cluster	• Morowali (EV Battery) • Jakarta (Sunter, Cakung, Pulogadung) • West Java (Bekasi, Karawang, Purwakarta, Bogor, Banten)	Super Clusters • Ayutthaya • Pathum Thani • Chonburi • Rayong • Chachoengsao • Prachinburi • Nakhon Ratchasima

4	Incentives Policies for Consumer	**Government Regulation Number 73 Year 2019 Concerning Luxurious Goods in the Form of Motor Vehicle that Subject to Sales Tax on Luxury Goods**
		HEV
		Up to 3,000 cc
		• Full Hybrid
		  ○ CO2 emission < 100 g/km = 15% with tax base 13 1/3% of sales price
		  ○ CO2 emission more than 100 g/km until 125 g/km = 15% with tax base 33 1/3% of sales price
		  ○ CO2 emission more than 125 g/km until 150 g/km = 15% with tax base 53 1/3 % of sales price
		• Mild Hybrid
		  ○ CO2 emission < 100 g/km = 15% with tax base 53 1/3% of sales price
		  ○ CO2 emission more than 100 g/km until 125 g/km = 15% with tax base 66 2/3% of sales price
			Excise Tax (**Eco Car with seating not exceeding 10 seats Hybrid electric vehicle)**
			• With cylindrical volume not exceeding 3,000 cc and CO2 emission not exceeding 100 g/km = 10%
			• With cylindrical volume not exceeding 3,000 cc and CO2 emission exceeding 100 g/km but not exceeding 150 g/km = 20%
			• With cylindrical volume not exceeding 3,000 cc and CO2 emission exceeding 150 g/km but not exceeding 200 g/km = 25%
			• With cylindrical volume not exceeding 3,000 cc and CO2 emission exceeding 200 g/km = 30%
			• With cylindrical volume exceeding 3,000 cc = 50%
			• Electric powered vehicle = 10%
			• Fuel cell powered vehicle = 10%

		○ CO2 emission more than 125 g/km until 150 g/km = 15% with tax base 80% of sales price 3,000 cc – 4,000 cc • Full Hybrid and Mild Hybrid ○ CO2 emission < 100 g/km = 20% ○ CO2 emission more than 100 g/km until 125 g/km = 25% ○ CO2 emission more than 125 g/km until 150 g/km = 30% PHEV, BEV, FCEV (Fuel Cell EV) 15% with tax base 0% of sales price	
5	Incentives Polices for Producer	**Finance Ministry Regulation Number 150/PMK.010/2018 Concerning the Granting of Income Tax Reduction Facilities** Reduction of Corporate Income Tax (CIT) by 100% if new investment with a minimum value of Rp500 million with: • 5 Years (Rp500 million – Rp1 Trillion) • 7 Years (Rp1 Trillion – Rp5 Trillion) • 10 Years (Rp5 Trillion – Rp15 Trillion) • 15 Years (Rp15 Trillion – Rp30 Trillion) • 20 Years (More than Rp30 Trillion) • After the tax deduction period ends, the taxpayer is given a CIT reduction of 50% for the next 2 tax years for the value of new investment.	HEV • Exemption of import duties on machinery • 50% deduction of excise tax rate if the project also produces battery Plug-in EV • Exemption of import duties on machinery • CIT Exemption for 3-6 years • 50% deduction of excise tax rate if produce battery in the project BEV • Import duty exemption for CBU for 2 years • Import duty exemption for machinery • CIT exemption for 5-10 years • 2% of excise tax rate f produce battery in the project Battery Electric Bus

		Reduction of CIT by 50% if new investment with a minimum value of Rp100 million – Rp500 million with: • 5 Years reduction of CIT • After the tax deduction period ends, the taxpayer is given a CIT reduction of 25% for the next 2 tax years for the value of new investment.	• Exemption of import duties on machinery • CIT Exemption for 3-6 years
6	GDP Per Capita	• Indonesia (2019) = $4,135.60 • Jakarta (2019) = $19,030	• Thailand (2019) = $7,808.20 • Bangkok = $18,706.6
7	Car Density Ratio	• 2017 = 498.5 (ASEAN Secretariat, ASEANstats Database)	• 2017 = 547.8 (ASEAN Secretariat, ASEANstats Database)
8	Automotive Annual Sale	• 2018 = 1,151,291 • 2019 = 1,030,126	• 2018 = 1,041,739 • 2019 = 1,007,552
9	Import Tariff on Battery	• Manganese, Lithium, Other Primary Cells and Primary Batteries = 15% • Mercuric Oxide, Silver Oxide, Air-Zinc = 10%	• Manganese Dioxide, Mercuric Dioxide, Silver Oxide, Lithium, Air-Zinc, Other Primary Cells and Primary Batteries = 10%
10	Import Tariff on Natural Resources	• Nickel, Cobalt, Graphite, Aluminium, Lithium Oxide = 5% • Manganese = 0%	• Nickel, Cobalt, Manganese, Graphite, Lithium Oxide = 0% • Aluminium = 3%
11	Availability of Natural Resources	2018 (Ton) • Nickel = 1,174,580,804 • Cobalt = 1,055,539,528 • Manganese = 2,061,612,945 • Graphite = 17,000,000 • Bauxite (Aluminium) = 1,174,580,804 2019 (Ton) • Nickel = 2,624,338,391 • Cobalt = 989,345,309 • Manganese = 53,262,458 • Graphite = 17,000,000	Manganese = 20,700,000 metric tons in 2019

		• Bauxite (Aluminium) = 2,340,935,136	
12	Production Capability	• Indonesia set the target to produce lithium battery in 2022 and estimated the growth will increase as the country's EV growth in the future. • Indonesia will have the largest lithium battery raw material factory in the world to be built in Morowali, Central Sulawesi. The investment reached USD 4 billion or equivalent to IDR 56 trillion.	• BMW Group Thailand is marking another historic milestone with the inauguration of a local high-voltage battery production plant in partnership with the DRÄXLMAIER Group • Mercedes-Benz and Thonburi Automotive Assembly Plant is building its sixth global battery production base in Thailand • Dubbed the "Tesla of Thailand", SET-listed Energy Absolute (EA) will kick off the first phase of its 100-billion-baht lithium-ion battery production line in mid-2020 • Battery assembly production is part of Toyota's total investment of 19 billion baht for hybrid electric vehicles (EVs) at the Gateway plant in Chachoengsao
13	Saturated Market	• 22 OEMs (Astra, GM, VW, Daimler, Hyundai, Nissan, BMW, Indomobil, Isuzu, Tata, SAIC/Wuling, Hino, Dongfeng/Sokon, Suzuki, Toyota, Mitsubishi, Gaya Motor, UD Trucks, Daihatsu, Honda, Fuso, National Assemblers)	• 28 OEMs (Bangchan, Dongfeng, Hino, Mazda, Sammitr, Tan Chong, Toyota, BMW, FOMM, Honda, Mitsubishi, Scania, Tata, Volvo/UDA Trucks, Chery, Ford, Hyundai, Nissan, Subaru, Thai Rung, VW, Daimler, GM, Isuzu, SAIC/MG, Suzuki, Thonburi, Yontrakit) EV • Nissan (Battery) • Honda

			• Thonburi / Mercedes (Battery) • Scania • FOMM • Mitsubishi (Battery) • Toyota (Battery) • Ford / Mazda 2nd • Suzuki • SAIC/MG • BMW
14	Ease of Doing Business	• Rank in the World = 73 • Rank in Asia-Pacific = 9 • Score = 68.2	• Rank in the World = 21 • Rank in Asia-Pacific = 5 • Score = 79.5

Source: Various Resources

5. Discussion

5.1. Indonesia Advantages Compared to Thailand

Data comparison between Indonesia and Thailand, there are 5 variables that Indonesia is superior rather than Thailand. The variables are labour wage, government incentives policy for EV consumer, automotive annual sale, import tariff on natural resources, and availability of natural resources. Those variables showed the advantage of Indonesia to attract FDI and develop their EV.

Indonesia's labour wage is lower compared to Thailand. The cheaper labour wage is preferred rather than the expensive one because it will affect the cost of production in the future. Cost of production is the total cost that hold by the business to produce a certain amount of product. When the labour wage is expensive, it will burden the cost of production.

Indonesia government incentives policy for EV consumer is more generous rather than Thailand. The form of incentives given by both country is in the form of tax such as excise tax and tax on luxury goods. The purpose of the tax incentive by both countries is to alleviate the tax given for EV buyers and they would be interested to buy or own an EV. If compared between Thailand, when the people buy EV in Indonesia, the tax given is cheaper because they tax base on certain amount of sales price. One of the examples is when the price of EV is around US$ 7,000 with the type of EV is full hybrid with the cylindrical volume not exceeding 3,000 cc and the CO_2 emission less than 100 g/km, the tax for both countries will be:

In Indonesia:

Tax = 15% x ($13\frac{1}{3}\%$ x US$ 7,000) = US$ 139.65

So, the consumer will pay US$ 7,139.65 for the EV that they bought.

In Thailand:

Tax = 8% x US$ 7,000 = US$ 560

So, the consumer will pay US$ 7,560 for the EV that they bought.

The incentives in the form of tax could attract the investor to invest because it showed the government's determination to carry out its plans and as a form of government signal to stimulate FDI inflow (Bond & Samuelson, 1986, p. 822). Besides that, it will attract people's attention to the product that being sold and it could attract them to buy the product. For the country itself, tax incentives mean as the tool for investment promotion in the specific industries or activities that will bring greater benefit to the country. When the government gives tax incentive it is expected to increase the sales of EV. Therefore, Indonesia government incentives policy for EV consumer is preferable compared to Thailand.

Indonesia's automotive annual sale is higher compared to Thailand. The automotive annual sale in Indonesia mostly showed positive growth. Automotive annual sale showed the interest of people in automotive product. In the eye of investor, this number showed the size of the market in terms of buyers where the numbers show how many people could buy the product. When the number is increasing, it can be seen as the positive sign to the industry and there is a potential to develop other products. In the case of attraction to invest, higher automotive annual sale is preferable because there is a possibility to develop and sell EV in the country. Therefore, Indonesia is preferable than Thailand.

Indonesia's import tariff on natural resources for battery is lower compared to Thailand. The lower import tariff on natural resources will attract the attention of manufacturers because they could import the battery if they already possess battery manufacturing elsewhere or could import required raw materials to manufacture the battery. Indonesia's lowest tariff is 0% for manganese and the other natural resources are 5%, while Thailand's lowest import tariff is 3% for aluminium and the other natural resources are 5%. Indonesia has an advantage over manganese battery because the raw material (manganese) is not subject to import tariff. It would be advantageous for manufacturer to develop this battery because there is no additional import cost. Import tariff can influence the price of goods that sell in the country because the consumer who buy the goods will pay the tariff through higher price of product. The higher price of product will decrease the willingness of buyer. Hence, it will influence the price of EV because there is additional expense in battery's raw material and the price of EV in the market will be higher. Therefore, Indonesia's import tariff on natural resources for battery is preferable.

Indonesia has abundance natural resources to make EV battery. The main resources such as nickel, cobalt, manganese, graphite, and bauxite (aluminium) available quite a lot in Indonesia compared to Thailand that only have manganese. These natural resources are the raw material to make EV battery. Indonesia has potential in every type of EV battery because the raw materials exist in Indonesia. Indonesia has potential to make every type of EV battery that seen from the natural resources point of view. In the case of EV, Indonesia's consider has a lot potential and is accompanied by the availability of natural raw materials will simplify the process of creating EV battery and reduce the production cost from importing the raw materials.

In the relation with FDI inflows, those variables could attract investor to invest in Indonesia because of lower production cost, lower tax for consumer when buy an EV, higher automotive annual sale, lower import tariff on natural resources, and abundance natural resources for EV battery. Moreover, those variables could become a consideration to invest because of the advantages that will obtain by the investor when they invest in Indonesia. Not to mention that those variables are the charming point of Indonesia to establish EV manufacturing.

5.2. Thailand Advantages Compared to Indonesia

The data comparison between Indonesian and Thailand, there are 9 variables that Thailand has the advantage compared to Indonesia. The variables are human capital index, industrial cluster, government incentives policy for EV producer, GDP per capita, car density ratio, import tariff on battery, production capability, saturated market, and Ease of Doing Business (EODB). Those variables showed the advantage of Thailand to attract FDI and develop their EV industry.

Thailand's human capital index is higher compared to Indonesia. The human capital index will help to see which countries are likely to have a more skilled worker. Therefore, the country with higher human capital index will attract more investor to invest in the selected industry. Thailand's industrial cluster is better for EV industry compared to Indonesia. The several regions in Super Cluster are specialized for automotive industry and EV will be part of the development (Thailand Board of Investment, 2015). Super cluster provided place for manufacturer to build their factory in Thailand and carried out the activity to develop automotive industry. From the company perspective, industrial cluster will affect productivity due to the easy access to centralized information, faster and diverse innovation due to the cooperation and competition, also the formation of new business chains (Lines & Monypenny, 2006, p. 21). From country perspective, industrial cluster will assist the government to make policies that are more focused on industries within the clusters (Lines & Monypenny, 2006, p. 22). Industrial clusters will be able to attract investors to invest because when the cluster becomes the main centre of an industry, the cluster will indirectly attract the key players in the industry, both domestic and foreign. Therefore, Thailand's industrial cluster is more attractive compared to Indonesia because the readiness to develop EV and not to mention existing EV manufacturer in the super cluster

Government incentives policy for EV producer in Thailand is more specific compared to Indonesia. Thailand gives deduction of excise tax when the project include battery, and CIT exemption for 3-10 years based on the type of EV. The company could get another deduction of excise tax if their project include battery. It can help to cut the tax for the goods and make a cheaper price. Hence, it will give them benefit to develop their business and find their market in the country. The specific incentives for EV industry by the government shows how the government support the industry. Therefore, government incentives policy for EV producer in Thailand is preferable compared to Indonesia.

Thailand's GDP per capita is higher compared to Indonesia. GDP per capita is important because indirectly it can describe the market size in the country and how the country perform the economy (Alshamsi, Hussin, & Azam, 2015, p. 136). GDP per capita measures people living standard in the country and shows the wealth level. When a country has higher GDP per capita, the possibility to spend more money to buy goods and services is higher. In the case of automotive market, the higher GDP per capita showed the higher possibility of people to buy EV. When the possibility of people to buy EV is higher, it means that the possibility of EV sales is higher, and it will bring more profit to the company. Therefore, Thailand's GDP per capita is more preferable compared to Indonesia for EV development.

Car density ratio in Thailand is higher compared to Indonesia. Car density ratio showed ownership of cars per person. If the car density ratio is higher, the people who own car is higher in the country. It means that the amount of people who can buy car is higher, and the market of car is bigger. In the case of EV, car density ratio can help to see people's willingness to own vehicle. Higher car density ratio can be a tool to predict EV sales in the country because they migrate from ICE Vehicle to EV. There is a possibility of the company to sell more

EV in the country who has higher car density ratio. Therefore, Thailand's is preferable compared to Indonesia in terms of car density ratio.

Thailand's import tariff on battery is lower compared to Indonesia. All type of batteries gets 10% import tariff in Thailand, compared to Indonesia who give 10-15% import tariff on battery. In the case of EV, battery is an important part of it. When the company decide to import battery for EV, they will subject to import tariff. There will be additional price for the battery. Hence, it will influence the price of EV because there is additional expense in battery and the price of EV in the market will be higher. Moreover, it is important for EV company to consider the lower tariff in order to sell EV in lower price and attract more people to buy it. Therefore, Thailand is preferable compared in Indonesia due to the lower import tariff on battery.

Production capability Thailand is better compared to Indonesia. The production capability showed country capability to make battery for EV. Thailand's plan to increase their capability to develop EV is more mature than Indonesia. This reflected through the investment by several EV manufacture in Thailand, where they already invested in battery plan to produce EV battery until battery testing laboratory as a place to test EV battery. Toyota Thailand, Energy Absolute, and BMW Group Thailand with DRÄXLMAIER Group Thailand are the company who invested in battery plan to produce EV battery to support the growing production of EV in Thailand (Bangkok Post, 2018; Bangkok Post, 2019; BWM Group, 2019). Meanwhile, Mercedes-Benz cooperated with National Science and Technology Development Agency (NSTDA) to build EV battery testing laboratory in Thailand for lithium battery (Bangkok Post, 2019). The possibility of Thailand to maintain level of production especially EV battery is higher because they have greater preparation. Therefore, Thailand is preferable compared to Indonesia because they are more ready to develop EV.

Thailand's automotive industry is more saturated compared to Indonesia. More OEMs in the country indicate the market is more saturated. Saturated market means the volume of goods as services has been maximized which is indicated by the number of players in the market. In this market, there are many competitors and the competition tend to be more competitive. When there are many competitors in the market, it will increase the awareness of the product that offered. Consumer awareness to the product will increase due to the number or marketing advertisement from each producer to attract attention. It can reach more and diverse consumers. In the case of EV manufacture, saturated market is better to because wider market due to the diverse consumers and high awareness of the products. EV producer can make EV according to the desired target consumers and will indirectly keep innovating to survive in the competitive market and earn profits. Therefore, Thailand is preferable compared to Indonesia due to the saturated market in automotive.

In the last five years, Indonesia's rank and score has been lower than Thailand's EODB (World Bank, 2016, p. 5; World Bank, 2017, p. 7; World Bank, 2018, p. 4; World Bank, 2019, p. 5; World Bank, 2020, p. 4). The score and ranking showed how business-friendly regulations the country is. The higher score and ranking the country get, it means that the country is more business-friendly regulations compared to the country who get lower score and rank. EODB measured by 12 areas of business regulation from starting business until resolving insolvency (World Bank, 2020, pp. 3-4). When the country has a high barrier to establish a business, it will hinder the development because it is likely that company will be hampered to build their company and the time that can be used to develop resources is wasted (Fonseca, Lopez-Garcia, & Pissarides, 2001, p. 694). Besides that, when the country has a higher cost of creating a business, it will be a barrier to company formation in the country (Klapper, Laeven, & Rajan, 2006, p. 605; Moscoso Boedo & Mukoyama, 2012, p. 155). EODB give access to the economic opportunities where the company find it easier to set up their business in the country.

Besides that, company will spend less cost and less time because the simple bureaucracy when set up their business and it can be allocated for more important things in the business. In the case of EV, EODB will show which country has more business-friendly regulations so it will speed up the business establishment. As the early-stage business, it is important to consider EODB to save cost and time. Therefore, Thailand is more preferable compared to Indonesia because their EODB score and ranking is higher.

Those variables will help Thailand get FDI inflows for their country and attract investor to invest in Thailand. A lot of advantages will obtain by investors, and it will lead them to get more profit. The possibility of higher productivity, the readiness of the circumstances, EODB, lower import tariff on battery, and more saturated market could become the consideration to invest in Thailand. Not to mention that those variables are the charming point of Thailand to establish EV manufacturing.

6. Conclusion

After the data comparison between both countries, Indonesia has 5 out of 14 variables that stronger rather than Thailand. When the company establish EV project in Indonesia, they can decrease the EV price due to the lower labour wage, lower import tariff on natural resource for battery, and abundance natural resources to make EV battery that reduce the cost of production in order to sell the EV in lower price and still maintain to get maximum profit. Besides that, it supported with the generous incentives polices for EV consumer in the form of tax incentives to attract people to buy EV and higher automotive annual sale that showed the market size in terms of buyers.

Meanwhile, Thailand has 9 out 14 variables that stronger rather than Indonesia. When the company establish EV project in Thailand, they are more supported in production activities because they have more productive worker to produce more goods and industrial cluster that will help specialized for automotive industry especially EV with government incentives policy for EV producer in terms of exemption on import duties, deduction of excise tax, and CIT exemption. Besides that, they also have production capability that is more ready due to the investment by several EV manufacture in Thailand and higher saturated market that encourage to innovate. Nevertheless, they give lower import tariff on battery that can reduce the cost of production but still they have higher GDP per capita that shows wider market size and higher car density ratio that show how many people can have cars in the country. There is a higher chance to buy EV in higher price compared to Indonesia.

Even though Thailand has more stronger variables compared to Indonesia, but they have each speciality. Indonesia was more to consumer side due to the lower price of EV meanwhile Thailand was more to production activities that will produce more EV. Both of them has strengths and weaknesses depends on how to see the country as the potential place for investment. In order to see which country was superior as a place to invest, it must return to the investor itself because it must be adjusted with the business needs, goals, and objectives. Both countries have the opportunity to get FDI in order to realize their plan of manufacturing EV based on the policy leading to manufacturing EV.

Limitations and Avenue for Future Research

This article is limited to the data gathered from 2020. While there are some changes in the current situation, it does not have any significant differences due to global economic circumstances. This article suggests a follow up research on competitiveness and market penetration of electric vehicle in both country that could help improve the study field.

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