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The Determinant of Foreign Direct Investment and its Implication upon Non-Oil Export in Indonesia Using SmartPLS

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The research objectives are to analyse the structural model of the financial risk, interest rate, and exchange rate upon foreign direct investment and its implication upon non-oil exports in Indonesia. The independent variables are financial risk, interest rates, and exchange rates. The intervening variable is foreign direct investment, while the dependent variable is non-oil export, and it will be supported by data from 1999 to 2018. The method of this research is a path analysis, where Partial Least Square software was used as the instrument to estimate the data. The study found that none of the independent variables have a significant influence upon foreign direct investment. However, the result proved that the financial risk, and foreign direct investment have significant influences upon non-oil export.

Keywords: *Financial risk, Interest rate, Exchange rate, Foreign direct investment, Non-oil export*

Introduction

The growth of export is one of the most important factors for strengthening economic growth. There are several essential factors that could effect on the export, especially non-oil export, such as the financial risk, interest rates, exchange rates, and foreign direct investment. Foreign direct investment, and non-oil export are affected by several factors such as financial risk, interest rate, and exchange rate. The financial risk factor is one of the most important factors concerned in economic development. Harvey stated that country risk is contributed by economic risk, financial risk, political risk, and composite-risk rating (Erb, Harvey et al., 1996)

Meldrum concludes that company analysts may improve the performance of risk measures available from commercial services by adjusting the risk measurement, such as financial risk to fit the company's specific type of foreign direct investment (Meldrum, 2000). Meanwhile, one of the major findings of Hayakawa and Kimura is that among the political and financial risks, only the political risk is adversely associated with foreign direction investment inflows (Hayakawa, Kimura et al., 2013)

The interest rate also affects the condition of foreign direct investment or non-oil export. Dunning and Rugman argued that the real interest rate on the commercial sight deposits is used to approximate the overall economic instability, including foreign direct investment (Dunning & Rugman, 1985).

Another factor, which can be classified as an importance factor in affecting the foreign direct investment and non-oil export, is the exchange rate because since the exchange rate is a depreciation condition, it leads the import product to become more expensive, and the speculators create an oligopoly agreement for the import product. It is noted that the Indonesian exchange rate was approximately Rupiah 14,777 per United States (US) dollar in 2018 (BPS, 2018) and Indonesia exchange rate is the weakest exchange rate in Asia. According to Dornbush, the depreciations cause substituting and enhancing exports from imports to local costumers who produced goods (Dornbusch, 1976). In addition, Dornbusch examined that the exchange rate has effects upon the inflation rate, and the import flows of trade (Dornbusch 1979). Similarly, Rautava found real exchange rate effects on the gross domestic product (GDP) (Rautava 2004). On the contrary, Bailey argued that the exchange rate impacted upon export growth (Bailey, Tavlas et al., 1987).

In terms of non-oil export in Indonesia, in 2012, the Indonesian economic growth was indicated to increase signficantly at about 6.2 per cent. Here, it was contributed to by the rate of investment growth of approximately 18.6 per cent, and the ratio between investment and GDP, which was 33.2 per cent. (Asian Development Outlook, 2013).

The risk is several factors should be considered in deciding economic development, such as economic risk, financial risk, and political risk. Ksantini and Boujelbène (2014) stated that financial crisis — including economic risk, and financial risk — has a negative and significant impact on foreign direct investment.

The exchange rate, economic risk, and average minimum wage are indicated to influence the export value and GDP in Indonesia. In 2018, it was noted that the Rupiah exchange rate experienced a depreciation of approximately 5.7 per cent, while non-oil exports increased by 4.03 per cent, and surprisingly, foreign direct investment decreased by 8.8 per cent. To improve the value of non-oil exports and investment, the financial risk should be maintained wisely. During the last five years, the financial risk in Indonesia has slightly fluctuated at the

low level of risk and it *could* effect on foreign direct investment, and non-oil export. Meanwhile, Indonesian exports gradually increased, while foreign direct investment slightly decreased.

Literature Review

There are several relevant theories which could be used to analyse this research. They include risk, interest rate, exchange rate, export, financial management, investment management, and economic growth theories.

Moser found that risk was affected by the international trade (export), including political risk, and financial risk (Moser, Nestmann et al., 2008). This finding was supported by Simpson and Kujawa, who determined that there is a relationship between risk, especially exchange rate risk, and export (Simpson & Kujawa, 1974).

The rate of risk can be the stimulation of foreign investment, especially if it is in the low risks, as argued by Fornell, who stated that at low systematic risk outperforms the market by considerable margins (Fornell, Mithas et al., 2006).

The financial risk affects the value of exports, especially financial shock as a risk can reduce the export value (Amiti & Weinstein, 2011); (Ayob, Ramlee et al., 2015).

Interest rates can be defined as a rate set by a lender charge in the percentage for borrowing funds or using an asset. It has an important role in several kinds of businesses, and can greatly affect our goods and services transactions.

It is obvious that the interest rate affects the foreign direct investment because the interest rate is the rate of cost of fund, while foreign direct investment is the inflow of fund in the country (Erdal & Tatoglu, 2002); (Onyeiwu & Shrestha, 2004); (Dunning & Rugman, 1985). Since the interest rate is lower, it means that the prospect of investment is higher. Yang stated that the 30 days interest rate impacts upon foreign direct investment (Yang, Groenewold et al., 2000).

Regarding to the effect of interest rate on export, *It could be concluded that the real interest* rate are likely to affect export supply (Qian & Varangis, 1994). Meanwhile, Arslan and Van Wijnbergen argued that they were given primarily in the form of direct tax reductions, and preferential interest (Arslan & Van Wijnbergen, 1993).

The exchange rate, as an importance factor with an effect upon foreign direct investment, and which has been examined by Froot and Stein (1991), Klein and Rosengren (1994), and

Blonigen (1997), is an appropriate exchange rate that leads inward of foreign direct investment.

Babatunde Akanbia, Halimah Adedayo Alagbeb, Hammed Agboola Yusufc and Musibau Hammed Oluwaseyic (2017) examined the exchange rate volatility, and also found a significant negative effect upon non-oil export performance or foreign direct investment in Nigeria. Meanwhile, Lawrence Ehikioya Imoughele and Mohammed Ismaila (2015) proved that the exchange rate has a significant impact upon non-oil export in Nigeria.

In terms of the effects of foreign direct investment upon exports, including non-oil export, Rob and Vettas stated that a multinational can serve the foreign demand by two modes or by a combination of: it can export its products or it can create productive capacity via foreign direct investment (Rob & Vettas, 2003). Xuan and Xing also stated that there is relationship between foreign direct investment and exports in Vietnam (Xuan & Xing, 2008). This phenomoneon is also experienced in Australia, especially Australian manufacturing (Pfaffermayr, 1996).

Problem Statement

Based on the background of this study, the problem statements are developed as follows:

1. Are there any significant effects of financial risk upon foreign direct investment in Indonesia?
2. Are there any significant effects of the interest rate upon foreign direct investment in Indonesia?
3. Are there any significant effects of the exchange rate upon foreign direct investment in Indonesia?
4. Are there any significant effects of financial risk upon non-oil export in Indonesia?
5. Are there any significant effects of the interest rate upon non-oil export in Indonesia?
6. Are there any significant effects of the exchange rate upon non-oil export in Indonesia?
7. Are there any significant effects of foreign direct investment upon non-oil export in Indonesia?
8. Are there any significant effects of financial risk upon non-oil export via foreign direct investment in Indonesia?
9. Are there any significant effects of the interest rate upon non-oil export via foreign direct investment in Indonesia?
10. Are there any significant effects of the exchange rate upon non-oil export via foreign direct investment in Indonesia?

Hypothesis

Based on the background and problem statements of this study, the hypothesis are developed as follows:

1. There are significant effects of financial risk upon foreign direct investment in Indonesia.
2. There are significant effects of the interest rate upon foreign direct investment in Indonesia.
3. There are significant effects of the exchange rate upon foreign direct investment in Indonesia.
4. There are significant effects of financial risk upon non-oil export in Indonesia.
5. There are significant effects of the interest rate upon non-oil export in Indonesia.
6. There are significant effects of the exchange rate upon non-oil export in Indonesia.
7. There are significant effects of foreign direct investment upon non-oil export in Indonesia.
8. There are significant effects of financial risk upon non-oil export via foreign direct investment in Indonesia.
9. There are significant effects of the interest rate upon non-oil export via foreign direct investment in Indonesi.
10. There are significant effects of the exchange rate upon non-oil export via foreign direct investment in Indonesia.

Method

This research was used to analyse the influences between the independent variables, and the dependent variables. Thus, the formulation was developed as follows:

$Y_1 = \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + €_1$ ..... (1)
$Y_2 = \partial_1 X_1 + \partial_2 X_2 + \partial_3 X_3 + \partial_4 Y_1 + \mu_1$ ..... (2)

To obtain the homogenous data, the formulation can be modified to:

$Y_1 = \alpha_1 \text{Log} X_1 + \alpha_2 \text{Log} X_2 + \alpha_3 \text{Log} X_3 + €_1$ ..... (1a)
$Y_2 = \partial_1 \text{Log} X_1 + \partial_2 \text{Log} X_2 + \partial_3 \text{Log} X_3 + \partial_5 \text{Log} Y_1 + \mu_1$ ..... (2a)

Whereas: €1 = error term of Y1 μ1 = error term of Y2

X1 = Indonesian financial risk
X2 = Indonesian interest rate

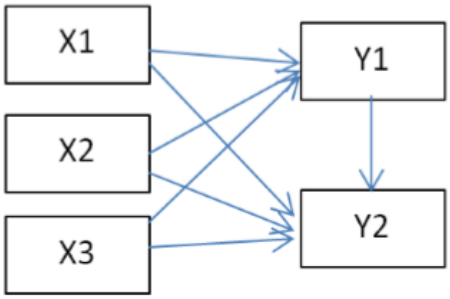
X3 = Indonesian exchange rate
Y1 = Indonesian foreign direct investment
Y2 = Indonesian non-oil exports

The above formulation can be solved by path analysing or by using the Structural Equation Model SmartPLS. By using this software, an examination of the direct and indirect effects can be achieved concurrently. This statistic analysis is utilised for several reasons, including: the time series data is less than 30, for the intervening variable component of the research model, it is heterogenic, and the data is not normal. A classic assumption test is not necessary when using this data analysis as the SmartPLS applied the covariance approach. The steps of analysis are outlined as follows:

1. Designing the structural model (inner model)
2. Constructing a path diagram
3. Converting a path diagram to regressions
4. Hypothesis parameter
5. Examining the hypothesis

Based on all variables that were built, the research model can be displayed as follows:

Figure 1. Research Structural Model



Whereas X_1 = financial risk, X_2 = interest rate, X_3 = exchange rate, Y_1 = foreign direct investment, and Y_2 = non-oil export.

From the Figure 1, it can be explained that X_1, X_2, and X_3 have direct influences upon Y_1; and X_1, X_2, X_3, and Y_1 have direct influences upon Y_2.

Data Collection

The data was collected from several sources of data, including the Central Statistical Bureau (BPS) of Indonesia, and the International Country Risk Guide (ICRG). All of the collected data is time series secondary data from 1999 to 2018.
The data collected can be shown as follows:

Table 1: Empirical Data of Variables 1999–2018

Year	Financial Risk	Interest Rate	Exchange Rate (Rp/$US)	Foreign Direct Investment ($US million)	Non-Oil Export ($US million)
1999	31.83	23.44	7,808.92	10,890.60	38,873.20
2000	33.13	11.16	8,534.42	15,413.10	47,757.40
2001	31.33	14.52	10,265.67	15,045.10	43,684.60
2002	33.96	14.41	9,261.17	9,744.10	45,046.10
2003	34.88	9.62	8,571.17	13,207.20	47,406.80
2004	35.54	6.19	8,985.42	1,895.00	55,939.30
2005	37.38	8.12	9,750.58	8,336.00	66,428.40
2006	38.83	10.88	9,141.25	4,914.00	79,589.10
2007	40.08	7.60	9,163.67	6,928.00	92,012.30
2008	40.04	8.16	9,756.75	9,318.00	107,894.10
2009	37.46	8.43	10,386.17	4,877.00	97,491.70
2010	39.04	6.82	9,078.25	13,771.00	129,739.50
2011	39.71	6.74	8,773.25	19,242.00	162,019.60
2012	40.13	5.56	9,418.58	19,138.00	153,043.00
2013	40.75	6.17	10,562.67	18,817.00	149,918.80
2014	39.33	8.23	11,884.50	21,810.00	145,961.20
2015	39.13	7.86	13,457.58	16,642.00	131,791.90
2016	40.71	6.80	13,329.83	2,659.00	132,080.80
2017	41.50	6.21	13,401.00	20,579.22	153,083.90
2018	40.96	6.06	14,243.83	21,474.11	162,840.90

Source: BPS 2018, BI 2018, ICRG 2018

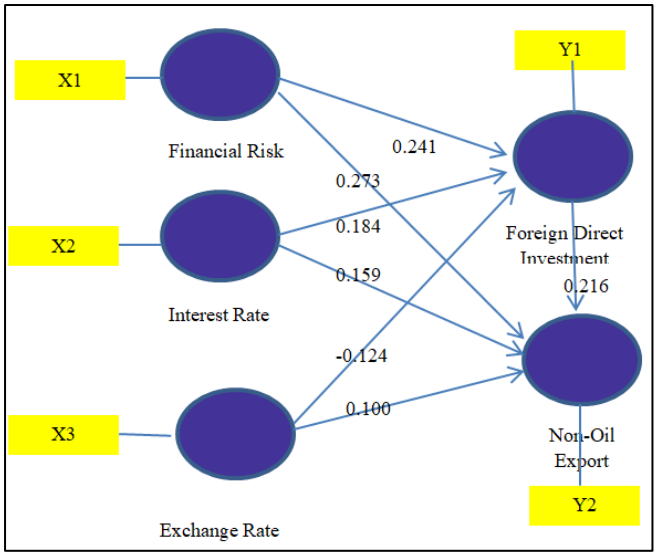
The Table 1 shows that the Indonesian financial risk slightly increased, while the Indonesian interest rate, and exchange rate gradually decreased. Meanwhile, the Indonesian foreign direct investment, and non-oil export fluctuated during 1999, and until 2018.

All of the data was processed and examined by using the software SmartPLS 3.20 version.

Results and Discussion

After undertaking a statistical analysis by using the SmartPLS, the figure of model was found, as follows:

Figure 2. The Structural Model



Another result is the path coefficient, as follows:

Table 2: Path Coefficients

Path Coefficients Matrix Path Coefficients		
	Foreign Direct Investment	**Non-Oil Export**
Exchange Rate	0.159	0.100
Financial Risk	0.151	0.747
Foreign Direct Investment		0.216
Interest Rate	0.184	-0.124
Non-Oil Export		

Source: ICRG, SEKI and BPS 2019, Processed

From the Table 2, this information can be converted into a path equation, as follows:

$Y_1 = 0.151X_1 + 0.184X_2 + 0.159X_3$

This means that financial risk, interest rate, and exchange rate have positive effects upon foreign direct investment.

It is examined that as the financial risk decreases, the foreign direct investment increases. This condition is supported by Fornell, who mentioned that at a low systematic risk, it outperforms the market by considerable margins (Fornell, Mithas et al., 2006).

In reagrd to the interest rate as an independent variable, the findings show that as interest increases, foreign direct investment will increase because a high interest rate leads the high earning of investment. It is reasonable that when prospect investment is appropriate, the interest rate tends to increase and the investment will increase, as well as foreign direct investment. This reason is supported by Erdal and Tatoglu (2002), Onyeiwu and Shrestha (2004), Dunning and Rugman (1985), and Yang, Groenewold et al. (2000).

Another factor is the exchange rate, and it is examined that the exchange rate has positive effects upon foreign direct investment because when the Indonesian Rupiah (IDR) depreciates, the capital local companies are weaker, and the competetiveness of local companies also lowers. Thus, foreign direct investment will increase by taking over the oppurtunities. This notion is supported by Froot and Stein (1991), Klein and Rosengren (1994), and Blonigen (1997).

$$Y_2 = 0.747X_1 - 0.124X_2 + 0.100X_3 + 0.216Y_1$$

This means that financial risk, exchange rate, and foreign direct investment have positive effects upon non-oil export, while the interest rate has a negative effect upon non-oil export.

When the financial risk is lower, it leads companies to produce more efficiently and effectively because of lower costs of fund. Moreover, the export commodities prices could be lower, and the demand of exports will higher. Similarly, in the study undertaken by Qian and Varangis, the effect of the interest rate upon exports found the real interest rate is likely to affect the export supply.

On the contrary, the interest rate has negative effects upon non-oil export. This means that when the interest rate is lower, so that exporters can expand their capital through a loan from a commercial bank, it could increase the export commodities. This finding was supported by the research undertaken by Arslan and Van Wijnbergen (1993).

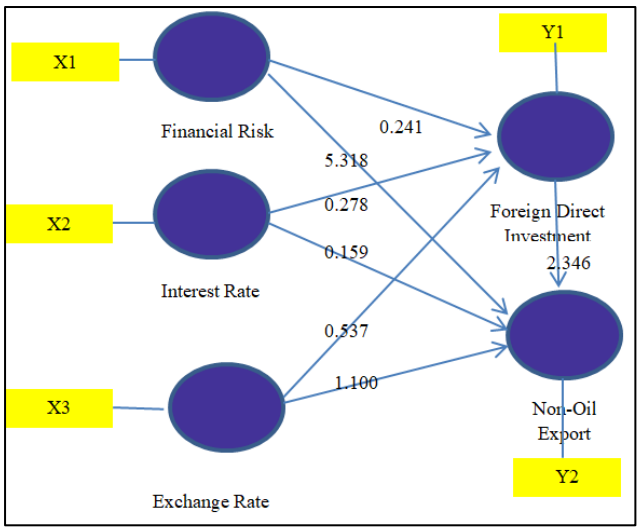
In respect to the exchange rate, it was found that the rate has positive effects upon non-oil exports because when the IDR experienced depreciatiation, the export commodities price lowers abroad, and the export demand could increase. This notion is supported by Lawrence

Ehikioya Imoughele and Mohammed Ismaila (2015), whom proved the exchange rate has a significant impact upon non-oil exports in Nigeria.

In terms of foreign direct investment, it was examined that foreign direct investment has positive effects upon non-oil export. This finding is substantiated because when there is foreign direct investment, the company production capacity in the host country increases, and becomes more efficient because companies can utilise the high technology capabilities of machines, and finally, companies can increase their export capacities. This study finding is supported by research undertaken by Xuan and Xing (2008), and Pfaffermayr (1996).

The next step of the analysis using the SmartPLS comprises running the bootstrapping facility. Thus, the new figure is shown as follows:

Figure 2. The Bootsrapping Structural Model



After bootstrapping, the path coefficient can be shown as follows:

Table 3: Bootstrapping Path Coefficients

Path Coefficients					
	Original	Sample	Standard	T Statistik	P-Value
Exchange Rate → Foreign Direct Investment	0.159	0.137	0.295	0.537	0.592
Exchange Rate → Non-Oil Export	0.100	0.081	0.090	1.109	0.270
Financial Risk → Foreign Direct Investment	0.151	0.018	0.629	0.241	0.810
Fiinancial Risk → Non-Oil Export	0.747	0.740	0.140	5.318	0.000
Foreign Direct Investment → Non-Oil Export	0.216	0.218	0.092	2.346	0.021
Interest Rate → Foreign Direct Investment	0.184	0.032	0.674	0.273	0.786
Interest Rate → Non-Oil Export	0.124	0.142	0.142	0.874	0.384

Source: ICRG, SEKI and BPS 2019, Processed

The Table 3 explores the direct effects of the independent variables upon the dependent variables, as well as the hypothesis of this research with several parameters, as follows:

The level of confidence is 95 per cent or alpha equals 0.05. Due to this, all of the hypothesis are two-tailed hypothesis term. Hence, alpha is converted to 0.05/2 equals 0.025. The degree of freedom of this research is n–k-1, whereas n equals the total of the data series, and k equals the total of the variables; thus, 19-5-1=13. The T table (0.025;13) equals 2.160. Therefore, the hypothesis will be accepted since the t test > t table or t test > 2.160.

It is examined that the hypothesis 4 that financial risk has a significant effect upon non-oil export, and the hypothesis 7 that foreign direct investment has a significant effect upon non-oil export, are accepted. Meanwhile, the hypothesis 1 that financial risk has significant effect upon foreign direct investment is rejected, the hypothesis 2 that interest rate has significant effect upon foreign direct investment is rejected, and the hypothesis 3 that exchange rate has significant effects upon foreign direct investment is rejected. Other hypothesis such as and the hypothesis 5 that the interest rate has significant effect upon non-oil export is rejected, and the hypothesis 6 exchange rate has significant effects upon non-oil export are also rejected.

Financial risk has significant effects upon non-oil export because to produce export commodities, companies require significant capital. Hence, the financial risk is lower, so the companies take advantage of the opportunities to expand or increase their exports. This is significant because almost all of the companies implemented this strategy. Similarly, foreign direct investment has significant effects upon non-oil export because exporter companies require high technology machines for production to be more efficient. In this case, when almost all the companies run this strategy, non-oil export will increase significantly.

On the contrary, financial risk, interest rate, and exchange rate have significant effects upon foreign direct investment, partially because financial risk, interest rate, and exchange rate slightly fluctuate, and can create effects upon foreign direct investment.

The advantage of using the SmartPLS Version 3.2 includes that all indirect effects can be explored automatically, as follows:

Table 4: Bootstrapping Specific Indirect Effects

Specific Indirect Effects					
	Original	Sample	Standard	T Statistik	P-Value
Exchange Rate → Foreign Direct Investment → Non-Oil Export	0.034	0.034	0.071	0.485	0.629
Exchange Rate → Foreigni Direct Investment → Non-Oil Export	0.033	0.004	0.164	0.199	0.842
Interest Rate → Foreign Direct Investment → Non-Oil Export	0.040	0.001	0.181	0.219	0.827

Source: ICRG, SEKI and BPS 2019, Processed

From the Table 4, it can be determined that the hypotheses that the exchange rate, financial risk, and interest rate have significant effects upon non-oil exports partially from foreign direct investment are rejected because all t tables are < 2.160. T

his is because of the very slight financial risk, interest rate, and exchange rate, and the effects are very small or can be ignored. It is also affected by financial risk, interest rate, and exchange rate indirect effects upon non-oil export from foreign direct investment, which can be seen in Table 4 as follows:

Table 5: R Square Value

R Square		
	R Square	R Square Adjusted
Interest Rate	0.036	-0,145
Non-Oil Export	0.915	0.892

Source: ICRG, SEKI and BPS 2019, Processed

The Table 5 shows that the contribution of the independent variables, such as financial risk, interest rate, and exchange rate, upon the dependent variable of foreign direct investment, are very limited or occur at a rate of 3.6 per cent. Meanwhile, the contribution of the independent variables, such as financial risk, interest rate, exchange rate, and foreign direct investment upon non-oil export are significant at 91.5 per cent.

Conclusion

Based on the results and discussion, it can be concluded that financial risk has a significant effect upon non-oil export. The hypothesis that foreign direct investment has a significant effect upon non-oil export is accepted. Meanwhile, the hypothesis that financial risk, interest rate, and exchange rate have a significant effect upon foreign direct investment partially, as well as the hypothesis that the interest rate, and exchange rate have a significant effect upon non-oil export partially, are rejected.

It is also can be concluded that the hypotheses that financial risk, and the interest rate have significant effects upon non-oil export partially from foreign direct investment are rejected. It is recommended that government policies should focus on financial risk, and foreign direct investment.

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