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ANALYZING INFLUENCES OF INFLATION, EXPORT, EXCHANGE RATE, AND LABOR COST TO FDI IN INDONESIA FOR PERIOD 2000-2012

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Abstract*-FDI is defined as investment inflow to a country other than investor's country to obtain long term interest or management control over companies operating in a host country. FDI can occur in the types of purchasing existing asset in a foreign country, to joint venture with a local company. This research will explain about the influences of inflation, export, exchange rate, and labor cost to FDI inflows in Indonesia. The data of FDI inflows are gathered from Asian Development Bank Institute in a quarterly basis for the period 2000 to 2012. To analyze the data, multiple linear regression is used to determine which variables give significant impact to FDI, and Granger Causality to observe if there is any causality relationship either in one way or two ways. The independent variables are inflation, export, exchange rate, and labor cost. The independent variables in this research were chosen based on the FDI theories. The data for the independent variables were gathered from Bank Indonesia and Badan Pusat Statistik. Before proceeding with the regression, the assumption test is done to ensure that the regression model is valid to be analyzed. After the assumption test is conducted and the variables are proven to be valid for regression, the hypothesis testing is conducted. It is found that only two variables give significant influence to FDI, which are export and labor cost. Both export and labor cost affects FDI in a positive relationship. Thus, it proves that open export economies tend to attract FDI inflows. It also proves that although labor cost influence FDI, lower labor cost does not always encourage FDI. Based on this result, it can be concluded that perhaps investor tend to choose Indonesia as a host country based on its business and trade environment rather than the financial indicators.*

Keywords: FDI Determinants, Inflation, Export, Exchange Rate, Labor Cost, Granger Causality

Introduction

In a globalized economy system, Foreign Direct Investment (FDI) plays a role in increasing economic growth. Economic growth is important for the national development. With the current economy state in Indonesia, it is necessary to improve its capital flows, both from government and private capital institutions. It is important to build a healthy environment to attract investors. FDI helps in contributing employment, boosting competitiveness, and also gaining technologies and managerial skills by knowledge transfer. Investments in the form of FDI are also usually long term thus reducing potential risk. According to OECD (2008), FDI is the capital acquired from investing in long term in a company in another country. The investor is referred as home country while the other company is referred as host country. Home country has the ability to control host country directly, whether partially or as a whole, by buying the company's stock with the minimum percentage of 10%. With this, investors have big influence to the management and production of the host country.

Arumugam Rajenthran explained the main factors that attracted FDI are as follow: "*The availability of vast, highly diversified natural resources, a huge potential domestic market, a competitive and productive labor force, and a market-oriented economic policy, amongst other factors, has attracted FDI inflows to Indonesia."* (2002:1).

Literature Review

FDI Theories

i. Ownership Advantages Theory

In this theory, Griffin and Pustay (2005) stated that firms who possessed valuable asset which creates competitive advantage domestically can use them to penetrate the foreign market. The asset could be in the form of well known brand names or superior technology. However, the ownership advantages theory does not explain why firms chose to penetrate the foreign market via FDI instead of exporting, licensing, or franchising.

ii. Internalization Theory

Internalization theory explains the growth of companies and their motivations in achieving FDI. According to Griffin and Pustay (2005),*"FDI is more likely to occur-that is, international production will be internalized within the firm-when the costs of negotiating, monitoring, and enforcing a contract with a second firm is high."* In this theory, when the cost of transaction is considered low, it is more likely for firms to internationalize by licensing their brand names or franchising their business operation, such as McDonalds. This theory is considered one of the main theories from many FDI theories.

iii. The Eclectic Theory

This theory was developed by Dunning. According to Dunning (1988), "*there are three factors causing the flow of capital from home country to host country."* The first one is the ownership advantages. The ownership advantages come in three types: monopoly advantages through ownership of natural limited resources, patents, or trademarks; technology; and economies of scale and scope, as well as greater access to financial capital.

The second one is the location advantages. Location advantages differ from each countries and are one of the important factors in determining the host countries. Location advantages comes in three types: economic benefits such as cost of transport, raw materials, labor costs, political advantages such as specific regulation in the host country regarding FDI or investment incentive, and social advantages such as cultural diversity.

The third one is internalization. Even though foreign companies have benefit from ownership and location advantages, there must be a stimulus in internalizing factor that attract investors to invest in the form of FDI instead of export, licensing, or franchising. Overall, the ecletic theory can be considered as a combination between the previously mentioned industrial organization, internalization, and location hypothesis.

Factors Influencing FDI

i. Inflation

The inflation rate is used to measure the rate of change in the overall price level of goods and services that we typically consume. While inflation is regular occurrence in modern economic system, it becomes a major concern when it reaches unacceptably high level. The inflation mechanism is explained using short run AD/AS model in figure 1. The shifting up of short run aggregate supply (AS) while aggregate demand (AD) remains constant will change the cross section between SAS and AD and thus caused the price level to rise, an indication of inflation.

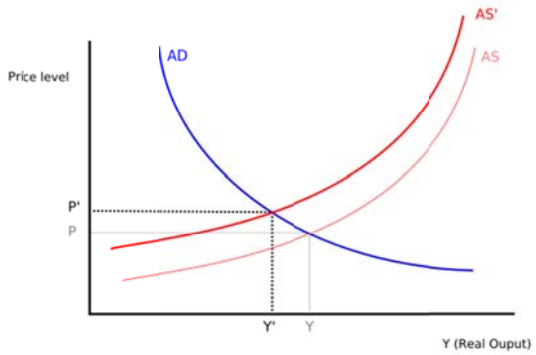

Figure 1 Short Run AD/AS Model

i. Export

According to Griffin & Pustay (2005), "*exporting is the selling of products made in one's own country for use or resale in other countries.*" Exporting activities are often divided into two types. One is trade in goods or tangible products such as clothing and raw materials, and the other one is trade in services or intangible products such as banking, travel, and accounting activities.

ii. Exchange Rate

According to Samuelson & Nordhaus (2001), "*exchange rate can be defined as the current market price for which the currency of a country can be exchanged to another. Exchange rates are determined in the foreign exchange market which is the marketplace where currencies from all around the world are traded.*" Samuelson & Nordhaus explained the mechanism behind foreign exchange rate using the graph below:

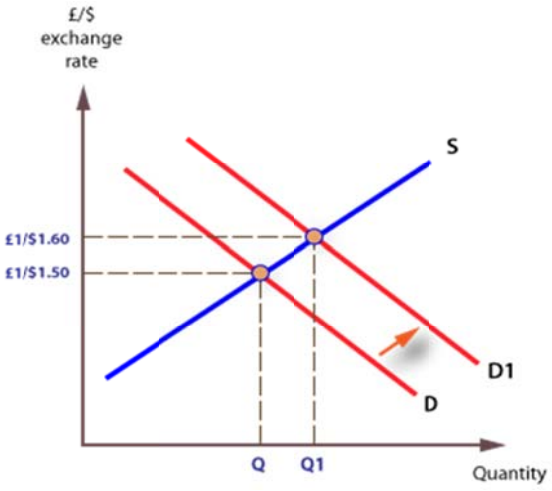

Figure 2 Demand and Supply of Foreign Currencies

iii. Labor Cost

Lower labor cost generally means lower cost of production. LTV can be expressed as the following:

c + L = W

- **c** = the constant capital of materials used in a period and its depreciated portion of tools used in the process
- **L** = the quantity of labor time performed in producing the finished commodities during the period
- **W** = the value of the product.

Methodology

The following diagram shown below shows the methodology implemented in this research.

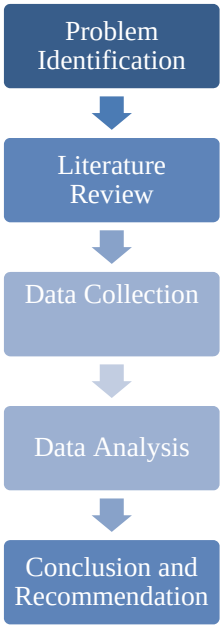

Figure 3. Methodology Framework

Data Collection and Analysis

The data used in this research are secondary quantitative data. Quantitative data are data in numerical information and thus can be analyzed statistically. Meanwhile the secondary data are the data which are already created for the benefit of its creator and can be used for next time purposes thus it can be collected easily, in this research it was via internet. The data is collected from Bank Indonesia, Badan Pusat Statistik, and Asian Development Bank Institute in the form of quarterly data series from 2000 to 2012 from their official website. The sample is determined based on the availability of data.

There are 1 dependent variable and 4 independent variables used in this research which are:

Table 1 Research Variables

Dependent Variable	Independent Variables
Foreign Direct Investment (Y)	Inflation (X_1)
	Export (X_2)
	Exchange Rate (X_3)
	Labor Cost (X_4)

The research model is as follow:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

- Y = dependent variable
- a = constant coefficient
- b = independent variable coefficient
- X = independent variable
- e = disturbance

This research model is used for the multiple linear regression analysis and interpretation. With this, the mean value of Y can be determined using with the value of the regressors.There needs to be assumption test before proceeding with multiple linear regression.

i. Normality Test

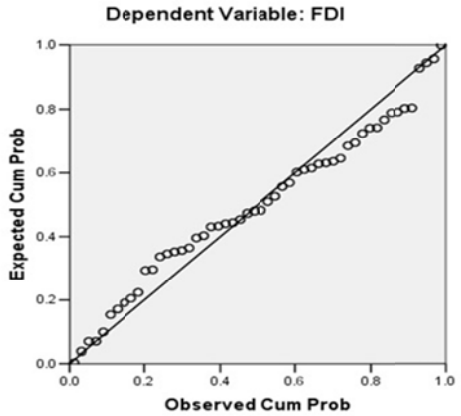

Figure 4 P-Plot

Based on this P-Plot, it can be seen that the data are plotted alongside the diagonal line which means that the data is linear. Meanwhile according to the histogram in figure 5, the data is shaped with a curve bell thus it can be concluded that the data is distributed normally.

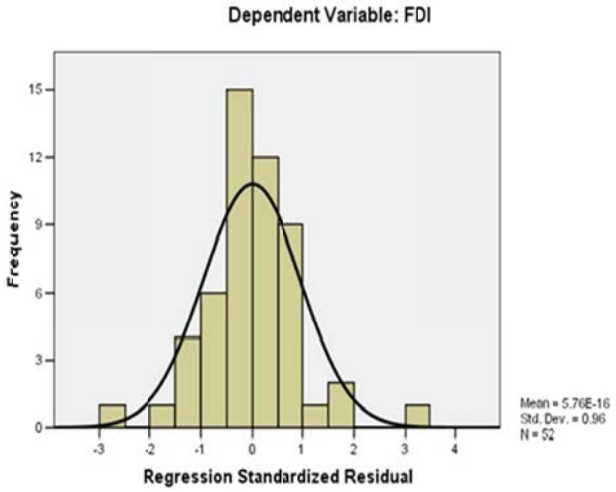

Figure 5 Histogram

ii. Autocorrelation Test

Table 2 Model Summary

Model Summary(b)	
Model	Durbin-Watson
1	1.587
a Predictors: (Constant), LaborCost, ExchangeRate, Inflation, Export	
b Dependent Variable: FDI	

Based on this result, the DW is 1.287 which falls between the dL (1.39290) < 1.587 < dU (1.7228). Thus the result is inconclusive. To further ensure the autocorrelation and provide more accuracy, the Run Test is done.

Table 3 NPar Test

Runs Test

	Unstandardized Residual
Test Value(a)	-39.31831
Cases < Test Value	26
Cases >= Test Value	26
Total Cases	52
Number of Runs	28
Z	0.280
Asymp. Sig. (2-tailed)	0.779

a. Median

This test uses significance level of 0.05. From the table above, Asymp. Sig. is 0.779 which is higher than 0.05 thus it can be concluded that the data is free from autocorrelation.

iii. Multicollinearity Test

Table 4 Cofficients (1)

Coefficients(a)			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	LaborCost	.901	1.109
	ExchangeRate	.164	6.114
	Inflation	.914	1.094
	Export	.161	6..215
a Dependent Variable: FDI			

According to the table above, all the requirements are fulfilled. The numbers of tolerance are all above 0.10 and all the Variance Inflation Factor (VIF) are below 10. It can be concluded that the data is free from multicollinearity..

iv. Heteroscedasticity Test

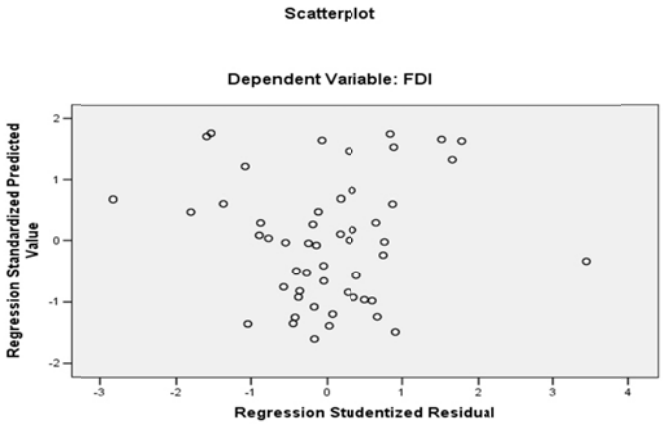

Figure 4.3 Scatterplot

The scatterplot above shows that the data represented by the circles are scattered in the top and down areas from the 0 in Y axis and there is no clear pattern from the plot hence the conclusion that the data is free from heteroscedasticity. After the assumption test, the data is now proven valid to be used for the regression model. The author used SPSS for the multiple linear regression. Table 5 shows the results and analysis generated from the regression.

Table 5 Model Summary

Model Summary(b)										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.918(a)	.842	.829	824.52380	.842	62.835	4	47	.000	1.587
a Predictors: (Constant), LaborCost, ExchangeRate, Inflation, Export										
b Dependent Variable: FDI										

As shown in the table, the result of the R Square is 0.842 which indicates that 84.2% of the dependent variable can be explained using the independent variables. Meanwhile, the 15.8% is explained by other factors not included in the linear regression model.

Table 6 Anova

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170870468.625	4	42717617.156	62.835	.000(a)
	Residual	31952456.298	47	679839.496		
	Total	202822924.923	51			
a Predictors: (Constant), LaborCost, ExchangeRate, Inflation, Export						
b Dependent Variable: FDI						

Based on the table above, the F-test result is 62.835 with the significance level of 0.000. Because the significance value is lower than 0.05, the data can be used for the linear regression model. And since the F-test (62.835) is higher than F-table (2.61), it can be concluded that the independent variables give simultaneous influence to dependent variable.

Table 7 Coefficients (2)

Coefficients(a)								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-3006.937	1536.183		-1.957	.056		
	Inflation	3405.16	7589.850	.027	.449	.656	.901	1.109
	Export	0.059	.023	.373	2.604	.012	.164	6.114
	Exchange Rate	-.050	.167	-.018	-.299	.767	.914	1.094

	LaborCost	.004	.001	.572	3.962	.000	.161	6.215
a Dependent Variable: FDI								

- Inflation (X_1)

Based on the t test result above, the p value for X_1 (0.656) > significance level (0.05) which means that inflation does not give significant influence to FDI. The t-test is positive (0.449) which means that it moves in the same direction as Y.

- Export (X_2)

The p value for X_2 (0.012) < significance level (0.05) which means that export fives significant influence to FDI. The t-test is positive (2.604) which means that it moves in the same direction as Y. The positive value indicates that if export increases, FDI also increases.

- Exchange Rate (X_3)

The p value for X_3 (0.767) > significance level (0.05) which means exchange rate doesn't give significant influence to FDI. The t-test is negative (-0.299) which means that it does not move in the same direction as Y.

- Labor Cost (X_4)

The p value for X_4 (0.000) < significance level (0.05) which means labor cost gives significant influence to FDI. The t-test is positive (3.962) which means that it moves in the same direction as Y. The positive value indicates that if labor cost increases, FDI also increases.

After the significant variables that influence FDI have been determined, the equation for regression can be analyzed using the significant variables only. Based on the table above, the equation is:

$$Y = (-3006.937) + 0.059X_2 + 0.004X_4$$

The constant is -3006.937 which indicates the value of FDI, if export and labor cost have 0 values. The coefficient value of X_2 to Y is 0.059 which indicates that each time export increases for 1 unit, FDI increases for 0.059. Meanwhile, the coefficient value of X_4 to Y is 0.004 which indicates that each time labor cost increases for 1 unit, FDI increases for 0.004 with the assumption that the other independent variables are constant.

After the regression is analyzed, the causality relationship can now be observed using Eviews.

Table 8 Pairwise Granger Causality Export-FDI

Pairwise Granger Causality Tests Date: 05/06/14 Time: 17:56 Sample: 2000Q1 2012Q4 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause EXPORT	51	4.32362	0.0430
EXPORT does not Granger Cause FDI		11.0683	0.0017

FDI cause export since the probability is 0.0430 < 0.05. Export also cause FDI since the probability is 0.0017 < 0.05. It can be concluded that export is stronger in causing FDI. This helped explain that export oriented economies may attract FDI more than the less oriented ones. Those with export oriented economies are regarded as countries with economic growth. Export is also one of the indicators of open market economic system (trade openness and less entry barriers to free market). Thus, there is a causality relationship in both ways.

Table 9 Pairwise Granger Causality Labor Cost-FDI

Pairwise Granger Causality Tests Date: 05/06/14 Time: 17:59 Sample: 2000Q1 2012Q4 Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
LABORCOST does not Granger Cause FDI	51	23.5130	1.E-05
FDI does not Granger Cause LABORCOST		1.16004	0.2868

Based on the result above, labor cost cause FDI since the probability is 0.00001 < 0.05, and FDI does not cause labor cost since 0.2868 > 0.05. Thus they have a causality relationship in one way. This proves the theory that labor cost is an indicator in attracting FDI, although its relationship in attracting FDI is different since they are in a negative relationship. Thus, the theory that the lower labor cost the more FDI inflows is not sufficient for Indonesia.

Conclusion and Recommendation

Based on the analysis above, it can be concluded that out of 4 variables only export and labor cost give significant influence to FDI in Indonesia during the period 2000-2012. Both export and labor cost influence FDI in a positive relationship. As for the causality relationship, based on the result, it appears there is causality relationship one way in labor cost and FDI, and causality relationship in two ways in export and FDI. Although both export and FDI influence each other, it appears that labor cost gives stronger influence to FDI. It can be concluded that export and labor cost are the important factors in attracting FDI inflows to Indonesia. This can be an indication that investors are attracted more toward the business and trade environment rather than the host country's financial indicator. Perhaps this is caused by investors that seek benefits for the long term instead of profitability for the short term only.

Thus, according to the findings in this research it is recommended that:

- As investors are more concerned over the business environment in Indonesia (evident by export and labor cost significant to FDI), Indonesia needs to also maintain the barrier or gives incentives in investing in Indonesia, such as tax holiday. And also eliminate corruption as it hinders foreign investor.
- As the increase in labor cost cause the increase in FDI, it can be concluded that investor does not only seek profitability in short term. Since lower labor cost generally means lower labor quality, it can be concluded that investor also seek the benefits in the long term, especially if the FDI is in the form joint venture. Thus, to attract more FDI there needs to be more well developed skill specialization program, such as Sekolah Menengah Kejurusan, for those who are unable pay for higher education. The free education program should also be distributed more evenly throughout all the cities in Indonesia.

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