

# DEMAND FOR LABOR ANALYSIS: A STUDY OF THE RORE OF FOREIGN DIRECT INVESTMENT ON EMPLOYMENT IN INDONESIA

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## ABSTRACT

The purpose of this study is to find out and to analyze: (a) How the influence of Foreign Direct Investment (FDI) on employment in Indonesia during the period of 2010 to 2019, (b) Which type of investment was dominantly affecting labor absorption in Indonesia during the period of 2010 - 2019, (c) How is the responsiveness of labor demand to Foreign Direct Investment (FDI), Domestic Direct Investment (DDI), Gross Domestic Product (GDP), interest rates, and nominal exchange rates, and (d) How is the stability of labor demand function during the period of 2010-2019. By using the time series data test, the study concluded that: (a) Foreign Direct Investment (FDI) had a significant positive effect on labor demand, (b) it turned out that FDI was more dominant in its influence on labor demand compared to DDI, (c) Demand for labor was more responsive (elastic) to FDI, GDP and nominal exchange rates, but less responsive (inelastic) to DDI and interest rates, and (d) The function of labor demand turns out that during the period of 2010 to 2019 was stable. This means that labor demand in the long run is relatively consistent.

**Keywords:** FDI, DDI, GDP, interest rates, nominal exchange rates and labor demand.

## 1. INTRODUCTION

Investments consist of two types, namely foreign and domestic investment. Foreign investment is related to the transfer of technology and also employment. Two things to be achieved through this foreign investment, is clearly something that is strategic. Transfer of technology aims to catch up with technology in other countries. Especially in this era, technology is a factor that cannot be abandoned, especially information technology which is closely related to learning, work and earnings (Means, A.J., 2018). While job creation is an effort of the state in order to realize the welfare of the community in accordance with the demands of the constitution which is the obligation of the state. For Indonesia (with a large population), the creation of large employment opportunities is a necessity that cannot be delayed any longer, especially ignored. Efforts towards broader job creation are being intensified and are being pursued seriously by the Indonesian government at this time. This is proven by the realization of new employment figures that have exceeded the planned targets. The target of creating 10 million new jobs for 2015-2019 has been exceeded, because the realization has reached 11,196,270 jobs. The seriousness of the government can also be seen from the low rate of open unemployment in Indonesia. This figure is the lowest unemployment rate that occurred during the history of Indonesia stood. The figure is quite pantastic, reaching 5.01 percent (Tempo.Co, 17 November 2019). This is a proud achievement that must be maintained, so that the unemployment rate can continue to be pressed so that it can reach even lower numbers.

In fact, the unemployment rate is closely related to the rate of economic growth. If economic growth improves, it will automatically have a direct impact on employment, and at the same time reduce unemployment (Helmy, O., 2016). The labor absorption theory explains, there is a positive relationship between the rate of economic growth and the rate of employment. This can be analyzed using the concept of labor absorption elasticity (Anderson, B., & Braunstein, 2013; Tenzin, U., 2019; Behar, A., 2017; Kumar, R., 2007). In the case of Indonesia, at this time it is happening that for every 1 percent increase in the rate of economic growth, it is

estimated that it can absorb 200-300 thousand workers. Indeed, the key to overcoming unemployment is ultimately to increase the rate of economic growth (PresidenRI.go.id, 18 May 2019). Indeed, theoretically and empirically that economic growth is the driving force of employment.

It is undeniable that the rate of economic growth itself is greatly influenced by the investment climate, both foreign and domestic investment. The Government through the Investment Coordinating Board (BKPM) submitted data on investment conditions throughout 2014 to 2018 which have contributed to the creation of 6.3 million new job opportunities. In addition to technology, and the quality of human resources, investment is one of the main drivers of economic growth, especially in Indonesia. Even economic growth in 2020 which is expected to grow to around 5.2% - 5.5% still makes investment a dominant driver (Detik News, 27 July 2019). However, employment in recent years (2013-2014) tends to decrease. The absorption of Indonesian workers through investment, Foreign Direct Investment (FDI) and Domestic Direct Investment (DDI) reaches around 1.4 million people. Seen, throughout 2018 the number decreased again until there were 930 thousands left (Harnas.co, 8 March 2019). The phenomenon that occurs will be seen the effect on employment in more detail in this study.

This study will also examine how the influence of interest rates on job creation. Theoretically, employment could also be affected by monetary policy, for example through a low interest rate policy. The mechanism that will occur if the interest rate is lowered is as follows. Low interest rates become "a breath of fresh air" for investors (entrepreneurs), because interest is a very important cost component in business. So that the decline is very much awaited. Low interest rates will encourage new investment, business expansion and ultimately will increase economic output (economic growth rate) (Pill, H., 1997; Khandker, et al., 1998). The high rate of economic growth automatically through the multiplier effect mechanism will encourage job creation (Helmy, O., 2016; Tenzin, U., 2019).

In connection with the phenomenon described above, researchers want to analyze how the investment relationship with labor demand, because it seems, not many studies have

conducted in-depth analysis related to the effect of FDI and DDI on labor demand. Which type of investment predominantly affects labor demand in Indonesia during the period of 2010 to 2019. Specifically, this study was designed to find out and to analyze: (a) The effect of Foreign Direct Investment (FDI) on employment in Indonesia, (b) Which type of investments dominantly affect employment in Indonesia, (c) Responsiveness of employment to Foreign Direct Investment (FDI), Domestic Direct Investment (DDI), Gross Domestic Product (GDP), interest rates, and nominal exchange rates, and (c) How is the stability of the labor demand function during the period of 2010-2019.

## 2. EMPIRICAL MODEL

The most well-known production function model and often used as a reference in analyzing the relationship between input factor production and output is the Cobb-Douglas production function (Lee, W., 2017; Huiban, JP, at.al., 2004; Dong, Q., at .al., 2018; Sahnoun, M., & Abdennadher, C., 2018). These functions are often formulated as follows:

$$Q = AK^\alpha L^\beta \quad (1)$$

where  $Q$  is the output;  $A$  is the parameter of efficiency (eg technology);  $K$  is capital;  $L$  is labor;  $\alpha$  is the output elasticity of capital, and  $\beta$  is the output elasticity of labor. If we assume that the market is in a competitive market, the maximum profit will be obtained when the use of capital and labor in conditions of the marginal revenue product of capital is equal to the price of capital ( $r$ ) and the marginal revenue product of labor is equal to the rate of wages ( $w$ ) (Njikam, O., 2017; Warda, P., 2014; Lavoie, M., 2002). These conditions can be obtained by finding the first derivative of the profit function. So, finally the labor demand function that is obtained forms as follows:

$$L = (AK^\alpha)^{1/\beta} Q^{1/\beta} \quad (2)$$

As explained by several previous researchers (Yaniv, G., 2004; Handy, F., 2005; Okumura, T., 2012; Chen, CM, at.al., 2014; Koebel, B., 2014; Assad, R., 2014; Chang, SC, 2015; Allen, WD, 2015; Rasdorf, W., at.al, 2016; Tarjani, H., 2016; Zmami, M., & Salha, QB, 2019), that demand for labor actually influenced also by the price of capital inputs or interest rates ( $r$ ), the level of wages ( $w$ ) of imported products ( $M$ ), nominal exchange rate ( $NT$ ), productivity and risk factors ( $Prod$ ), export products ( $Qx$ ), labor unions ( $Un$ ), then the complete labor demand function ( $L$ ) can be written as:

$$L = f(K, Q, r, w, M, NT, Prod, Qx, Un). \quad (3)$$

## 3. METHODOLOGY

This study uses quarterly time series data for the period 2010Q01-2019Q01. Data obtained from Bank Indonesia Report (BI), Indonesian Central Statistics Bureau (CBS) and Investment Coordinating Board (BKPM), secondary data. The model that will be used in this study is in the form of logarithmic equations, namely:

$$\text{Log } Ld_t = a_0 + a_1 \text{Log } FDI_t + a_2 \text{Log } DDI_t + a_3 \text{Log } GDP_t + a_4 R_t + a_5 \text{Log } NT_t + e_t \quad (4)$$

$Ld$  is labor demand (as a variable of labor demand);  $FDI$  is Foreign Direct Investment;  $DDI$  is Domestic Direct Investment;  $GDP$  is the national output (Gross Domestic Product);  $R$  is the Indonesian reference interest rate for three months (BI-Rates);  $NT$  is the nominal exchange rate of the rupiah against the dollar, and  $e$  is the error terms. While parameters  $a_1$ ,  $a_2$ ,  $a_3$ ,  $a_4$  and  $a_5$  are regression coefficients of the labor demand equation model or the coefficient of elasticity of labor for  $FDI$ ,  $DDI$ ,  $GDP$ , interest rates and nominal exchange rates. Theoretically expected  $a_1$ ,  $a_2$ ,  $a_3 > 0$

(Njikam, O., 2017), while  $a_4 < 0$  (Ehrenberg, R.G., & Smith, R.S., 2003) and  $a_5 < 0$  (Chang, S.C., 2015).

Before the data is used in the model, several tests are performed first, namely the unit root test, cointegration test, Classical Assumption test and model stability test (Gujarati, D.N., 1995). The purpose of this test is to see the consistency of data and the validity of the data used in the study. The next step is to analyze the parameters obtained from the model, namely the analysis of the significance of the parameters, the analysis of influence and meaning.

There are many problems that might arise when Classical regression techniques are applied to time series data. One problem with time series data is spurious regression, which is an inconsistent, biased, inefficient regression and cannot be used for predictions. To detect any indications of spurious regression, a stationary test must be performed. Time series data is said to be stationary if it meets three requirements, namely having a constant, variance and covariance (Thomas, 1997). The stationerity test model that will be used in this study is the unit root test model, using intercept and trend. This test model is more complete because it will produce more parameters. If the data has not reached stationary at its level value, then the test continues with the stationerity test at the difference level, so that finally the stationary data is obtained. The next step is cointegration testing of the above model (unit root test of the long-term residual value of the model). The formula that can be used is a model developed by Dickey-Fuller (ADF test) (Enders, 1995; Hamilton, 1994), which is as follows:

$$\Delta \hat{e}_{ldt} = a_1 \hat{e}_{ld-t} + \sum_{i=1}^n a_{t+1} \Delta \hat{e}_{ld-t} + n \quad (5)$$

After the degree of integration of the basic equation is known, the next is to estimate the long-run equilibrium relationship function used in this study, namely the labor demand equation in the long run.

The next test is the Classical Assumption test, namely the normality test, serial correlation test, heteroscedasticity test and multicollinearity test. The purpose of this test is to see the suitability of the model used with the Classical Regression Assumption (BLUE Regression). Whereas to see the effect of variables  $FDI$ ,  $DDI$ ,  $GDP$ , interest rate ( $R$ ) and nominal exchange rate ( $NT$ ) on labor demand ( $Ld$ ) will be used t-test and F-test. T-test was conducted to see the partial effect of each independent variable on labor demand. While the F-test is conducted to see the effect simultaneously of the independent variables used on labor demand. To analyze the closeness of the relationship and the magnitude of the percentage variation in the dependent variable that can be explained by the independent variable will be used correlation analysis and the coefficient of determination.

In the final stage, the authors conducted a model stability test. The purpose of stability testing is to see the structural stability of a model in the long run. Are the regression parameters (the labor demand equality model) still consistent or have they changed? The stability testing model that will be used in this study is the Cumulative Sum of Squares of Recursive Residuals Test (CUSUMSQ Test). The advantage of this model compared to the Chow's Test model is that it is not necessary to know in advance when or at what point in time a function (the model to be tested for stability) shifts or changes (Greene, 1997; Simorangkir, 2002). Through the EVIEWS 9.1 program, confidence bounds and CUSUMSQ curves will appear automatically, if the regression equation has been obtained. Are the curves inside the boundary line, or are they outside? By looking at these curves, the stability of the model can be immediately known, whether stable or unstable.

**4. RESULTS AND DISCUSSION**

Unit root test results using the Augmented Dickey-Fuller (ADF) test, on all variables used in this research model

turned out to reach stationary at the second difference level. The test results can be seen in Table 4.1:

**Table 4.1.** Result of *Unit Root Test (P-Value)*

Variables	t-Statistic	Prob (P-Value)
<i>Ld</i>	-5.394742**	0.0007
<i>FDI</i>	-5.35662**	0.0009
<i>DDI</i>	-5.585728**	0.0053
<i>GDP</i>	-106.2472**	0.0000
<i>R</i>	-8.635902**	0.0000
<i>NT</i>	-7.008450**	0.0000

**Notes:** \*\*) significance at level  $\alpha$  1%

To see the long-term relationship between labor demand (*Ld*) and Foreign Direct Investment (*FDI*), Domestic Direct Investment (*DDI*), Gross Domestic Product (*GDP*), interest rate (*R*), and nominal exchange rate (*NT*), it is necessary cointegration test was conducted. Cointegration test results using the ADF-test, showed that the dependent variable and independent variables have the same degree of cointegration (at the second difference degree). The long-term equation obtained is as follows:

**Table 4.2.** Long-run Regression for Labor Demand (*Log Ld*)

Variables	Coeffisients	t-Statistic	Prob
$a_0$	29.99*	2.46	0.02
<i>Log (FDI)</i>	1.19**	3.02	0.00
<i>Log (DDI)</i>	0.82**	2.78	0.01
<i>Log (GDP)</i>	-3.73*	-2.00	0.05
<i>R</i>	0.11*	1.95	0.06
<i>Log (NT)</i>	-1.78*	-1.96	0.06
$R^2 = 0.44$ $F = 4.87^{**}$			

**Notes:** \*\*) Significance at level  $\alpha$  1%, \*) Significance at level  $\alpha$  10 %.

Classical assumption test results with tests of normality, multicollinearity, serial correlation and heteroscedasticity turned out to give satisfactory results, all the requirements are appropriate (no regression disease). So that the regression equation obtained can give an unbiased meaning (Best Linear Unlimited Estimator / BLUE) and can provide the right economic meaning.

From Table 4.2 it can be seen that all independent variables used in the model have a significant effect on labor demand. The level of significance used for the effect test varies. For *FDI* and *DDI* use a significance level of 1%, while for *GDP*, the interest rate and nominal exchange rate use a significance level of 10%.

Foreign Direct Investment (*FDI*) has a significant positive effect on labor demand (*Ld*), with an elasticity coefficient of 1.19 (elastic). This figure means, if there is an increase in *FDI* of 1%, it will have an impact on employment up to 1.19% (*ceteris paribus*). With the finding of such a relationship, it implies that *FDI* has a positive impact on job creation that is consistent during the period of 2010 to 2019 the first quarter. This finding is in line with the results of Waldkirch, et al. (2009) in Mexico, which states that *FDI* has a significant positive effect on employment opportunities in the Manufacturing Sector. In addition to creating new jobs, *FDI* has also proved to be able to increase the productivity of the Manufacturing sector in developing countries (Herzer, D., 2011; Suryanto, at.al., 2013).

By using a significance level of 1 percent, Domestic Direct Investment (*DDI*) has a significant positive effect on job creation in Indonesia. Regression coefficient obtained (elasticity of employment absorption on *DDI*) of 0.82 (inelastic). This figure gives the meaning, that by assuming other factors are fixed every 1 percent increase in *DDI* investment will bring the impact of job creation by 0.82 percent. Employment absorption (demand for labor) is less responsive to changes in Domestic Direct Investment (*DDI*),

and this figure is smaller when compared to the elasticity of employment absorption of *FDI*. The positive effect of *DDI* on employment, in line with the impact caused by *FDI* on job creation, is only less dominant.

Using a significance level of 10%, the study found that *GDP* had a significant negative effect on employment (an odd relationship). The coefficient of elasticity obtained is quite high, namely -3.73 (very elastic). This figure can be interpreted, that every 1 percent increase in *GDP* (1 percent rate of economic growth), the impact of a decrease in employment by 3.73 percent in the *FDI* and *DDI* sectors (this finding is not in accordance with the theory). However, this finding is in line with the study results of Tenzin, U. (2019) in Bhutan, where the rate of economic growth has no impact on reducing unemployment. On the contrary it is different from the results of research in several Gulf States, that the elasticity of labor absorption is positive and inelastic, which is 0.15 (Behar, A., 2017). It is also different from the results of research in Malaysia conducted by Kumar Raj (2007), which states that labor absorption responds to changes in output, but the response is slow.

The interest rate has a significant positive effect on employment at a significance level of 10 percent. The coefficient of elasticity obtained is relatively low, which is equal to 0.11 (inelastic). This figure can be interpreted that every 1 percent increase in the interest rate (BI-Rate) will encourage an increase in employment by 0.11 percent (contrary to theory). This finding is different from the results of research conducted by Pill, H. (1997) in UK, which states that an increase in real interest rates drives *GDP* growth per capita, which in turn (theoretically) can create jobs. The increase in real interest rates that occurred could be caused by a decrease in the inflation rate, causing a difference (spread) nominal interest rate with the inflation rate becoming larger (rising). The findings of this study are also different from the Micro Credit Program implemented in

# Demand For Labor Analysis: A Study Of The Rore Of Foreign Direct Investment On Employment In Indonesia

Bangladesh (Grameen Bank) which states that the Program encourages an increase in income, output and employment as well (Khandker, at al., 1998).

Finally, the nominal exchange rate variable has a significant negative effect on employment (at a significance level of 10 percent). The coefficient of elasticity of employment absorption to the nominal exchange rate is -1.78 (elastic). This figure gives a meaning that is a weakening of the nominal exchange rate of rupiah by 1 percent (depreciation of the rupiah against the dollar), resulting in a decrease in labor demand by 1.78 percent (*ceteris paribus*). This finding is in line with the research results of Ribeiro, et al., (2004) in Brazil, and Lyzenko, D. (2015) in Canada, but different from the experience in South Aprika, that strengthening the exchange rate, decreases the demand for traded goods, so that it has an impact on decreasing labor demand (Ngandu, SNC, 2009).

Simultaneously, the effect of *FDI*, *DDI*, *GDP*, interest rates and nominal exchange rates on labor demand is 44.0%, while the remaining 66.0% is the influence of other factors (*ceteris paribus*). The low coefficient of determination indicates the lack of independent variables involved in the model to explain fluctuations (variations) in labor demand. Other researchers can elaborate further by involving other variables that are more complete.

The results of the model stability test using the CUSUMSQ-test show that the labor demand equation model in the long run is stable (no significant structural changes occur), because the expected *St* value obtained is located between two lines of confidence (confidence bounds) at the significance level of 5 %. Thus, during the research period (2010-2019), there was no significant fluctuation in labor demand. This means that labor demand in the long run is relatively consistent.

## 5. CONCLUSION

The labor demand function is obtained by differentiated the profit function in order to obtain the maximum profit (first order conditions), assuming the labor market is in a perfectly competitive market. The model obtained is used to examine the relationship and the effect of Foreign Direct Investment (*FDI*), Domestic Direct Investment (*DDI*), Gross Domestic Product (*GDP*), interest rate (BI-Rate) and nominal exchange rate (*NT*) on labor demand with using quarterly data for the period of 2010 to 2019.

By using time series data analysis and various tests (unit root test, cointegration test, Classical Assumption test, and model stability test), the study found several important conclusions, namely: *First*, Foreign Direct Investment (*FDI*) turned out to have a significant positive effect on labor demand work. That is, an increase that occurred in Foreign Direct Investment (*FDI*) will be followed by an increase in job creation. *Secondly*, it was found that in fact Foreign Direct Investment (*FDI*) had more dominant influence on labor demand compared to *DDI*. This fact indicates that a greater contribution in job creation is given by *FDI*. *Third*, labor demand turns out to be more responsive (elastic) to *FDI*, *GDP* and nominal exchange rates, but less responsive (inelastic) to *DDI* and interest rates. *Fourth*, the function of labor demand in the long run (2010-2019), apparently is stable. This means that the demand for labor in this period is relatively consistent (there was no significant turmoil).

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*Demand For Labor Analysis: A Study Of The Rore Of Foreign Direct Investment On  
Employment In Indonesia*

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