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The Effect of Foreign Direct Investment and Road Infrastructure on Labor Absorption

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Abstract

This study aims to determine the effect of direct investment and infrastructure on employment through the manufacturing sector in Central Java in 1990-2020. The data analysis method used is the Path Analysis Method. The results showed that direct foreign investment had a positive and insignificant effect on the industrial manufacturing sector and road infrastructure had a positive and significant effect on the industrial manufacturing sector. Direct investment has a negative and insignificant effect on employment. Road infrastructure has a direct positive and significant effect on employment. Direct investment and road infrastructure have an indirect positive effect on employment through the manufacturing sector. Foreign direct investment and road infrastructure in total have a positive effect on employment through the manufacturing sector. The government is expected to be able to lead PMA into the manufacturing sector or the capital-intensive sector and always pay attention to road conditions.

Keywords: *Foreign Direct Investment, Road Infrastructure, Manufacturing Sector*

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh investasi asing langsung dan infrastruktur jalan terhadap penyerapan tenaga kerja melalui sektor industri pengolahan di Jawa Tengah tahun 1990-2020. Metode analisis data yang digunakan adalah metode Analisis Jalur (Path Analysis Method). Hasil penelitian menunjukkan bahwa secara langsung investasi asing langsung berpengaruh positif dan tidak signifikan terhadap sektor industri pengolahan dan infrastruktur jalan berpengaruh positif dan signifikan terhadap sektor industri pengolahan. Investasi asing langsung secara langsung berpengaruh negatif dan tidak signifikan terhadap penyerapan tenaga kerja. Infrastruktur jalan secara langsung berpengaruh positif dan signifikan terhadap penyerapan tenaga kerja. Investasi asing langsung dan infrastruktur jalan secara tidak langsung berpengaruh positif terhadap penyerapan tenaga kerja melalui sektor industri pengolahan. Investasi asing langsung dan infrastruktur jalan secara total berpengaruh positif terhadap penyerapan tenaga kerja melalui sektor industri pengolahan. Pemerintah diharapkan dapat menggiring PMA yang masuk ke sektor industri pengolahan ataupun sektor padat modal dan selalu memperhatikan kondisi jalan.

Kata Kunci: Investasi Asing Langsung, Infrastruktur Jalan, Sektor Industri Pengolahan

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INTRODUCTION

Indonesia is number four as the country with the most population in the world in 2020. According to the Worldometer (2021), the number reaches 273 million population. Half of Indonesia's population is spread over Java Island, which makes Java Island the most populous island. One of the problems with this large population is that it has an impact on the absorption of labor that is less than optimal and results in various unemployment problems. Boediono (1999) explains that this high economic growth can cause employment to increase or unemployment to decrease. The high economic growth in Central Java Province itself is mostly due to the growth of the manufacturing sector.

The industry has a strong relationship with employment, because industry requires labor to produce output (Ardiansyah et al., 2018 & Utomo, 2022). The growth of the industrial sector can increase employment, the industrial sector where the number of business units increases will also be followed by increased employment opportunities in the industrial sector because the output produced has increased. This can make the manufacturing sector a big influence in creating new job opportunities (Purwasih, 2015 & Asmara, 2018).

It can be seen in table 1 that the growth of the processing industry which is accompanied by an increase in labor absorption does not always occur in Central Java Province. The growth of the manufacturing industry for 2 consecutive years, namely 2015 and 2016 experienced a significant decline, but the open unemployment rate in Central Java also experienced a decline. This shows that the open unemployment rate is not only influenced by the manufacturing sector but there are other factors that influence it.

**Table 1.** Manufacturing Industry Growth (%) and Open Unemployment Rate (%) in Central Java Province 2013-2018

Year	Manufacturing Industry Growth	Open Unemployment Rate
2013	5.45	6.01
2014	6.61	5.68
2015	4.71	4.99
2016	4.10	4.63
2017	4.33	4.57
2018	4.35	4.51

Source: Central Java Statistics Agency, 2021

Endogenous growth theory explains that investment in physical capital and human resources results in an external economy and increased productivity that exceeds personal profits by an amount sufficient to reverse the effect of diminishing returns (Todaro & Smith, 2006). Foreign private investment can have a direct impact on increasing company productivity (Anwar & Sun, 2014). Foreign investment (PMA) has a positive role in the GRDP of the industrial sector because it is able to create job opportunities and increase the output produced (Parahita et al., 2013).

The development of foreign direct investment in Central Java Province, which can be seen in figure 1 is always increasing and is expected to absorb more workers. The increase in the manufacturing sector is also inseparable from infrastructure development in Central Java which is getting better, one of which is road infrastructure. Romer's endogenous growth model assumes that capital reserves (public goods) in the overall economy positively affect output at the level of production (Todaro & Smith, 2006). Productive companies will choose a location or place to set up their business with good transportation accessibility criteria (Melo et

al., 2021). Good road infrastructure provides benefits in saving travel time and spending on transportation costs (Kwang, 2021).
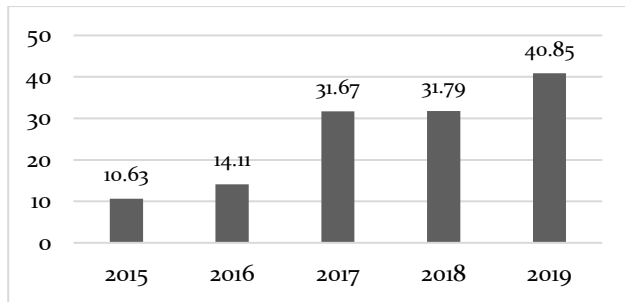

Figure 1. Development of FDI Central Java Province 2015-2019
Source: DPMPTSP, 2021

From 2016 to 2018, which can be seen in figure 2, the length of provincial roads in Central Java with good conditions is increasing every year. Good road infrastructure does not only affect the production sector. Improved quality and quantity of roads can increase investment attractiveness and eventually lead to increased development and impact on employment both during construction and after (Todaro & Smith, 2006). Changes in accessibility that are getting better can make the number of industries and have an impact on increasing the number of jobs compared to other areas that have poorer accessibility (Gibbons et al., 2019).

Companies employ someone because to help produce goods and services for sale to the consumer community (Sumarsono, 2009). This is in accordance with the results of previous studies by Zenda, s (2017) and Purwasih et al (2015) which analyzed the growth of the industrial sector and employment, the results showed that the growth of the industrial sector had a positive and significant impact on employment.
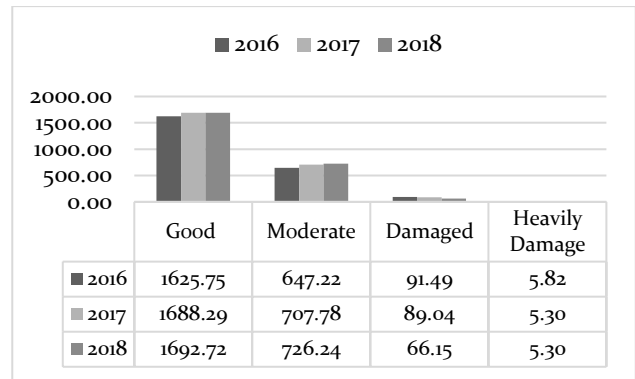
Figure 2. Length of Provincial Roads by Road Conditions in Central Java Province 2016- 2018
Source: Central Java Transportation Statistics, 2018

Looking at the existing phenomena and supported by previous research, which is supported by the number of foreign direct investments and road infrastructure in Central Java Province which is increasing every year, and the impact it has on the manufacturing sector and employment. So researchers are interested in researching "The Effect of Foreign Direct Investment and Road Infrastructure on Labor Absorption".

RESEARCH METHODS

This type of research uses quantitative research methods. The data used is secondary data from the period 1990-2020. Sources of data can be obtained from official websites owned by the state and regions such as the Central Statistics Agency (BPS) or official publications issued by agencies such as transportation statistics and others. The data analysis method used by the author is the path analysis method. The 2 structural equations include:

$$Y_1 = \alpha + (\rho Y_1 X_1)X_1 + (\rho Y_1 X_2)X_2 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

$$Y_2 = \alpha + (\rho Y_2 X_1)X_1 + (\rho Y_2 X_2)X_2 + (\rho Y_2 Y_1)Y_1 + \varepsilon \dots\dots\dots(2)$$

Where Y_1 is Manufacturing Sector, Y_2 is Labor Absorption, X_1 is Foreign Direct Investment, X_2 is Road Infrastructure, $\rho Y_{1,2} X_{1,2}$ is a Coefficient, ε is error term, ρ is parameters in Path Analysis.

This research is entitled "The Effect of Foreign Direct Investment and Road Infrastructure on Labor Absorption" where the variables are variable X_1 as foreign direct investment, variable X_2 road infrastructure, variable Y_1 in the manufacturing industry sector which is also an intervening variable, and variable Y_2 employment absorption.

RESULTS AND DISCUSSION

Central Java Province is the province with the third largest population in Indonesia, which is 34 million people in 2020 after West Java Province (49 million people) and East Java Province (39 million people) (BPS, 2020). Based on the results of the population census according to the Central Java Province BPS, the population of Central Java continues to increase. The population of Central Java has increased by about 4.1 million people in 10 years, from 2010 to 2020.

One of the indicators to determine the economic condition of an area or the level of welfare of an area is economic growth or GRDP (Boediono, 1999). According to BPS, in compiling GDP or GRDP, two approaches are used, namely the business field approach and the expenditure approach. GDP or GRDP is presented in 2 versions of the assessment, namely on the basis of current prices and on the basis of constant prices. On the basis of current prices, all of the aggregate valuations are based on prices in the current year, while on the basis of constant prices, prices are based on a certain base-year price.

Based on data from BPS, the contribution of the manufacturing sector to GRDP in Central Java according to the distribution of GRDP on the basis of current prices by employment contributes the most annually, followed by the agricultural sector, wholesale and retail trade sector, and the construction sector. The development of foreign direct investment in Central Java Province itself is always increasing, while road infrastructure in Central Java Province with good and moderate road conditions is also increasing every year. The increase in foreign direct investment and road infrastructure is expected to improve the economy in Central Java Province.

Table 2. Multiple Linear Regression Analysis Results of R Square

Indicator	r	R^2	Adjusted R Square
Substructure Test 1	0.927	0.859	0.849
Substructure Test 2	0.961	0.923	0.915

Source: Data Processed, 2021

Based on the value of R Square (R^2) at the output of substructure 1 testing in table 2 is 0.827, which means the magnitude of the influence of the exogenous independent variables of foreign direct investment and road infrastructure on the manufacturing sector is 85.9%, while the remaining 14.1 % caused by other variables outside the study. While the value of R Square in the output of the sub-structure 2 test above is 0.923, which means the magnitude of the effect of the exogenous independent variables of foreign direct investment, road infrastructure and the

manufacturing sector on the combined employment of labor is 92.3%, while the remaining 7.7% was caused by other variables outside the study.

Table 3. Multiple Linear Regression Analysis Results of R Square Results of t-test of Foreign Direct Investment, Road Infrastructure and Manufacturing Sector

Variabel	Coefficient (Beta)	t-test	Sig.	t-table
FDI (Sub-structure Test 1)	0.61	0.850	0.402	2.045
Road Infrastructure (Sub-structure Test 1)	0.917	12.794	0.000	2.045
FDI(Sub-structure Test 2)	-0.04	-0.082	0.935	2.045
Road Infrastructure (Sub-structure Test 2)	0.601	4.269	0.000	2.045
Manufacturing Sector (Sub-structure Test 2)	0.379	2.669	0.013	2.045

Source: Data Processed, 2021

SPSS output results in table 3 (Test Sub-structure 1) show that the research t-value of foreign direct investment is 0.850 < t-table of 2.045. So the decision is that Ho is accepted and H1 is rejected, meaning that there is no linear relationship between the exogenous independent variable of foreign direct investment and the endogenous variable of the manufacturing sector.

The magnitude of this influence can be seen from the beta coefficient value of 0.061 or 6.1%. This effect is not significant because the

significance value is 0.402 > 0.05. The research t value of road infrastructure is 12.794 > t table is 2.045. So the decision is that Ho is rejected and H1 is accepted, meaning that there is a linear relationship between the exogenous independent variable of road infrastructure and the endogenous variable of the manufacturing sector. The magnitude of this influence can be seen from the beta coefficient value of 0.917 or 91.7%. This effect is significant because the significance value is 0.000 <0.05.

The results of the SPSS output (Test Sub-structure 2) show that the research t value of the foreign direct investment is -0.082 < t table of 2.045. So the decision is that Ho is accepted and H1 is rejected, meaning that there is no linear relationship between the exogenous independent variable of foreign direct investment and the endogenous variable of employment. The magnitude of this influence can be seen from the beta coefficient value of -0.04 or -4%. This effect is not significant because the significance value is 0.935 > 0.05. The research t value of road infrastructure is 4.269 > t table of 2.045.

So the decision is that Ho is rejected and H1 is accepted, meaning that there is a linear relationship between the exogenous independent variable of road infrastructure and the endogenous variable of employment. The magnitude of this influence can be seen from the beta coefficient value of 0.601 or 60.1%. This effect is significant because the significance value is 0.000 <0.05. The research t value from the manufacturing sector is 2.669 > t table is 2.045.

So the decision is that Ho is rejected and H1 is accepted, meaning that there is a linear relationship between the exogenous independent variable of the manufacturing sector and the endogenous variable of employment. The

magnitude of this influence can be seen from the beta coefficient value of 0.379 or 37.9%. This effect is significant because the significance value is 0.013 < 0.05. Through the calculation results, it can be made a path diagram for the path analysis model as follows:
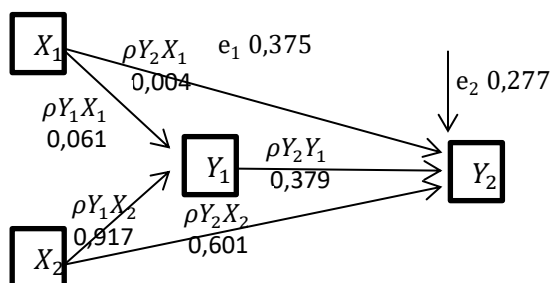
Figure 4. Path Diagrams for Model Path Analysis

Based on the results of the study indicate that there is a direct effect of foreign direct investment on the manufacturing sector in Central Java Province with positive and insignificant effects. This is in accordance with H1 which states that "directly foreign direct investment variables have a positive effect on the manufacturing sector in Central Java Province", indicating that H1 is accepted.

The direct effect of foreign direct investment on the manufacturing sector can be explained from the calculation according to the SPSS output of 0.061 or 6.1%. Sukarno (2006) states that investment is an activity to spend capital or production equipment in order to increase the ability to produce goods and services in future economic activities. This foreign direct investment has a positive effect, presumably because it is used to increase the ability to produce goods but in small quantities so that the results are not significant.

The results of this study are not in line with Parahita et al (2018) who state that foreign investment has a positive and significant effect on

the GRDP of the industrial sector. Jamaliah (2016) asserts that private investment invests its capital to increase production capacity. Increasing this production capacity, it can make a major contribution to the added value of production in all industrial sub-sectors. Anwar & Sun (2014) in their research found that foreign private investment can have a direct impact on increasing company productivity.

This positive impact can be even more effective when the industry is capital-intensive (Riesta, 2019). This is the cause of the results of foreign investment research having a positive effect on the manufacturing sector because foreign direct investment in Central Java Province is more capital and technology-intensive (Central Java Province investment realization statistics, 2018). Foreign direct investment in Central Java Province is not significant because many foreign direct investments enter the tertiary sector, where this tertiary sector is a sector in the form of services, not the secondary sector, especially the manufacturing industry sector, which can be seen in the table 4.

In 2016-2020, foreign direct investment entering the tertiary sector in Central Java Province was greater than the secondary sector, while in 2015 foreign direct investment entering the tertiary sector was quite large. This is suspected to be the cause of insignificant foreign direct investment in Central Java Province.

Based on the results of the study, it can be concluded that road infrastructure directly has a positive effect on the manufacturing sector. This is in accordance with H2 which states that "the road infrastructure variable directly has a positive effect on the manufacturing industry sector in Central Java Province", then shows that H2 is accepted. The direct influence of road infrastructure on the manufacturing sector can

be explained from the calculation according to the SPSS output of 0.917 or 91.7%.

Table 4. Foreign Investment by Sector 2015-2019

Sector	2016	2017	2018	2019	2020
Sector Primary	18,693.9	131,499.7	61,042.3	8,483.0	6,476.3
Sector Secondary	443,858.4	1,063,821.8	392,363.3	315,022.8	324,705.2
Sector Tertiary	568,243.6	1,177,201.0	1,919,297.7	2,399,734.4	1,032,453.5
Total	1,030,795.9	2,372,522.5	2,372,707.3	2,723,240.2	1,363,635.0

Source: BKPM, 2021

Todaro and Smith (2006) emphasized that the government has the opportunity to improve resource efficiency by providing infrastructure facilities that can accumulate human resources which ultimately causes the scale of results to increase. This statement can be the cause of road infrastructure having a significant effect on the manufacturing sector because through the provision of road infrastructure that continues to increase, the scale of results increases.

The results of this study are in line with the research of Barzin et al (2018) that the influence of road infrastructure on the growth of the manufacturing industry's own output is very large. Kwang (2021) asserts that good road infrastructure provides benefits in saving travel time and spending on transportation costs. The positive and significant influence of road infrastructure on the manufacturing industry sector is supported by district/city roads in

Central Java Province with good conditions from 1990-2020 which tend to increase every year.

Foreign direct investment has a direct negative effect and a positive effect on employment. This is contrary to H3 which states that "directly foreign direct investment variables have a positive effect on employment in Central Java Province", indicating that H3 is rejected. The direct effect of foreign direct investment on employment can be explained from the calculation according to the SPSS output of -0.004 or -0.04%. Simanjuntak (1985) asserts that the demand for labor can be interpreted from how much labor is received by companies with various levels of wages at a certain time. A foreign direct investment that has a negative effect on employment can be interpreted as a company whose capital comes from the foreign direct investment that does not demand labor but uses it for other purposes such as replacing more

sophisticated technology or for research and development purposes.

Regarding this situation, Widayana & Darsana (2020) and Dewi & Gunawan (2018) confirm that foreign investment has a negative effect on employment in the manufacturing industry sector. This is because the increase in foreign direct investment made by large companies is used to add more sophisticated technology that has a greater ability to produce greater production compared to human power. This is supported by the results of research from Pay (2014) that foreign investment has a positive effect on unemployment in the long term. It can be concluded that companies that initially used labor, in the future can be replaced with more sophisticated technology so that foreign direct investment is not able to increase employment.

Based on the results of the study, it can be concluded that road infrastructure directly has a positive effect on employment. This is in accordance with H4 which states that "the road infrastructure variable directly has a positive effect on employment in Central Java Province", indicating that H4 is accepted. The direct effect of road infrastructure on employment can be explained from the calculation according to the SPSS output of 0.601 or 60.1%. The results of this study are in line with the statement of Todaro and Smith (2006) that the increasing quality and quantity of roads causes investment attractiveness to increase development and has an impact on employment both at the time of construction or completion of construction.

The results of this study are also in line with research from Muliadi & Amri (2019) which found that the development of this significant job opportunity did not escape the availability of existing road infrastructure. Leigh & Neil (2011) and Chakrabarti (2018) confirm that government spending on road repairs substantially reduces local unemployment because it can stimulate job growth and reduce unemployment rates. This is supported by district/city roads in Central Java Province with good conditions from 1990-2020 which tend to increase every year due to road repairs or road construction.

Based on the results of the study, it can be concluded that the manufacturing sector directly has a positive effect on employment. This is in accordance with H5 which states that "the manufacturing sector variable directly has a positive effect on employment in Central Java Province", indicating that H5 is accepted. The direct influence of the manufacturing sector on employment can be explained from the calculation according to the SPSS output of 0.379 or 37.9%. According to Sumarsono (2009), companies employ someone because that person helps produce goods and services for sale to the consumer community. The manufacturing sector can increase the absorption of labor because when the manufacturing industry grows, the company will need more people to produce goods and services, so the company will demand labor which has an impact on employment. This is in line with Asmara's research (2018) that the GRDP of the manufacturing industry sector has a positive effect on employment.

The value of output that has increased can trigger a demand for labor used to increase production and sales. Zenda & Suparno (2017) also confirms that the number of industries has a positive and significant effect on the absorption of the number of workers. This positive direct influence of the manufacturing sector on employment may occur because the contribution of the manufacturing sector to GRDP in Central Java Province has always increased from 1990 to 2020.

Based on the above calculations, it can be concluded that foreign direct investment and road infrastructure have an indirect positive effect on employment through the manufacturing sector. This is in accordance with H6 which states that "indirectly foreign direct investment variables and road infrastructure variables have a positive effect on employment through the manufacturing sector in Central Java Province", indicating that H6 is accepted. The indirect effect of foreign direct investment on labor absorption through the manufacturing sector can be explained from the calculation according to the SPSS output of 0.023 or 2.3%.

Based on the above calculations, it can be concluded that foreign direct investment and road infrastructure have a total effect on employment in the manufacturing sector. This is in accordance with H7 which states that "in total, the variable of foreign direct investment and the variable of road infrastructure has a positive effect on employment through the manufacturing sector in Central Java Province", indicating that H7 is accepted. The total effect of foreign direct investment on employment through the manufacturing sector can be explained from the calculation according to the SPSS output of 0.44 or 44%.

Foreign Investment (PMA) has a positive role in the GRDP of the Industrial sector because it is able to create job opportunities and increase the output produced (Parahita et al., 2013). Purwasih (2015) and Asmara et al. (2018) also find that if the growth of the industrial sector can increase employment, the industrial sector where the number of business units increases will also be followed by increased employment opportunities in the industrial sector because the output produced has increased. This is in line

with the research of Barzin, S. et al (2018) which confirms that the influence of the road on the output growth of the manufacturing industry is very large.

Road infrastructure is an important factor in the smooth mobility of goods and services in economic activities because road infrastructure can trigger the emergence of new economic activities in the community (Amri, 2014). Meanwhile, road infrastructure improvements made the level of agglomeration more intensive which ultimately had an impact on company productivity (Kwang, 2021).

CONCLUSION

Based on the results of the analysis and discussion of the effect of foreign direct investment and road infrastructure on employment through the manufacturing sector, there are several conclusions that can be drawn.

First, foreign direct investment has a positive and insignificant effect on the manufacturing sector in Central Java Province in 1990 -2020. Second, road infrastructure has a positive and significant impact on the manufacturing industry sector in Central Java Province in 1990-2020. Third, foreign direct investment has a negative and significant effect on employment in Central Java Province in 1990-2020.

Fourth, road infrastructure has a positive and significant impact on employment in Central Java Province from 1990-2020. Fifth, foreign direct investment and road infrastructure have an indirect positive effect on employment through the manufacturing industry sector in Central Java Province from 1990-2020. Sixth, foreign direct investment and road infrastructure in total have a positive effect on employment through the

manufacturing industry sector in Central Java Province from 1990-2020.

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