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Labor Absorption of the Manufacturing Industry Sector in Indonesia

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Abstract

The manufacturing industry plays a very important and strategic role in contributing Gross Domestic Product (GDP) to the national economy and labor absorption. This study is aimed at analyzing factors influencing labor absorption of the manufacturing industry sector in Indonesia. This study employs the panel data regression analytical method of secondary data to calculate and analyze how significant are those factors influencing the labor demand of the manufacturing industry sector in Indonesia. It is found that wage, the number of industrial company, Gross Regional Domestic Product (GRDP), investment value, technology, and education variables have a significant influence on labor absorption. Partially, wage variable has a negative and significant influence on labor absorption. The number of industrial companies, regional gross domestic product, and technology variables have a positive and significant effect on it. On the other hand, investment value and education variables have no significant effect on labor absorption. The result of this study is expected to be taken into consideration in determining policies related to the process of industrialization and industrial the development suited to the related phenomena to improve the labors' better standard of living.

Keywords
labor; labor absorption; the manufacturing

I. Introduction

The digital era drives the development of technology in the manufacturing industry sector in Indonesia. Domestic investment is expected to increase the manufacturing industry sector as well as to encourage the development of technology to increase productivity and competitiveness. The manufacturing industry plays very important and strategic role in contributing Gross Domestic Product (GDP) to the national economy--20.16 percent of total GDP or IDR 13,588.8 trillion in 2017 (Statistics Indonesia (hereafter BPS), 2018d). The manufacturing industry also plays a major role in absorbing labor which accounts for 14.72 percent of the total workforce population (BPS, 2018c). The development of the manufacturing industry in the digital era will increase productivity and industrial competitiveness. However, this will also give an impact on human labors. Their role will be replaced by machines and robots. This situation is an irony because the manufacturing industry sector which is originally hoped to create new jobs and absorb more labor will become a threat for them to survive.

Table 1. Workforce, Employment, and Unemployment in 2010-2018

Years	Workforce (in million)	Employment (in million)	Unemployment (in million)
2010	116,56	108,21	8,32
2011	117,37	109,67	7,70
2012	118,05	110,81	7,24
2013	118,19	110,80	7,39
2014	121,87	114,63	7,24
2015	122,38	114,82	7,56
2016	125,44	118,41	7,03
2017	128,06	121,02	7,04
2018	131,01	124,01	7

Source: BPS (2018a)

Workforce category represent the manpower. Based on table 1, the number of workforce in Indonesia increases every year. It is followed by the number of employments which also increase. On the other hand, the number of unemployments decrease every year. It increases in 2013 but it decreases again in three following years--in 2016-2018. Unemployment occurs when the workforce (indicated by the number of workforce) is greater than the number of labor demands (indicated by the number of employment). The number of workforce in 2018 reaches 131.01 millions of people. It increases 2.95 million or 2.30% percent compared to the number of workforce in 2017 which is 128.06 million people (BPS, 2018a). The increase of workforce is influenced by high population growth. Indonesia's total population in 2018, based on a 2010-2035 population projection, is estimated at 265.52 million people. This increases 2.70 million people or 1.41 percent compared to the total population of Indonesia in August 2017 which amounts to 128.06 million people (BPS, 2018a).

Table 2. Medium and Large Manufacturing Industry Companies and Their Labor in 2010-2017

Year	The Number of Medium and Large Manufacturing Industry Companies (in unit)	The Number of Medium and Large The Manufacturing Industry Labors (people)
2010	23.345	4.501.145
2011	22.927	4.364.738
2012	23.592	4.928.839
2013	23.698	5.004.912
2014	23.744	5.132.150
2015	26.322	5.247.301
2016	32.619	5.974.776
2017	30.993	6.214.582

Source: BPS (2018a)

The number of medium and large the manufacturing industry companies in Indonesia always increases from 2010 to 2016 and it decreases in 2017. Somehow, in the same year of 2017, the number of medium and large the manufacturing industry labor increases. The number of labor in medium and large the manufacturing industries reflect the number of labor absorbed in the medium and large the manufacturing industries.

Along with the progress and industrialization experienced by Indonesia, Indonesia is faced with a wave of technology that is very fast and will shape the economy and job in the future. The power of technology including digitalization and automation continues to grow

and change the pattern of production, distribution, and consumption. This article will discuss the analysis of factors that influence labor absorption of the manufacturing industry sector in Indonesia.

II. Review of Literature

Neo-Classical Theory assumes that all parties have complete information about the labor market, so there is no possibility of voluntary unemployment. Therefore, at the level of real wage applied in the labor market, all people who are willing to work at that level will get a job. Unemployments are only those who are not willing to work at the prevailing wage rate (voluntary unemployment). In contrast to Keynes's theory that the labor market follows the goods market, Mankiw (2007) states that if the output increases, the number of people who get jobs will also increase and vice versa.

Labor demand illustrates the labor absorption in the industrial sector. The demand for labor is influenced by the demand for manufactured goods. The company will hire labors if the demand for manufactured goods increases. This is what is called as derived demand (Borjas, 2016; McConnell, Brue, & Macpherson, 2013; Santoso, 2012; Simanjuntak, 1985). Labor demand is largely determined by the nature of the demand for manufactured goods. The company will continue to increase the number of workers as long as they can boost additional sales which exceed the wages paid. The company will stop hiring labor to the point in which the wage level is equal to the marginal product value of the labor. This requirement must be met if the company wants to maximize its profit (Borjas, 2016). Labor demand plays an important role in policy assessment (Peichl & Siegloch, 2012).

Most studies of labor demand explain wages (Peichl & Siegloch, 2012). Chusna's research (2013) explains that wages have a positive and significant influence on employment. If the wage increases, labor demand will also increase. Unlike the Chusna's research, Arida, Zakiah, & Julaini (2015); Buchari (2016); Budiarto & Dewi (2015); Wijaya (2014); Ziyadaturrofiqoh, Zulfanetti, & Safri (2018) finds that wage has a negative and not significant effect on labor absorption. It means that a change in wage has no effect on labor absorption. Meanwhile, the study of Wihastuti & Rahmatullah (2018) shows that the provincial minimum wage has a negative and significant effect on labor absorption in Java. Besides wage, the number of companies will also increase labor demand (Greenlaw & Shapiro, 2011). Research written by Ismei, Wijarnako, & Oktavianti (2015) reveals that the number of company variable has a positive and significant influence on employment. it implies that if the number of companies increase, the labor demand will increase. The increase in the number of workers illustrates that labor absorption also increases.

The growth of the manufacturing industry is strongly influenced by the value of investment (Buchari, 2016). Investment activity by a company enables the community to increase their economic activity and employment opportunity (Matz & Usry, 2003). This is explained by Arida et al. (2015); Bashier & Wahban (2013); Budiarto & Dewi (2015); Chusna (2013); Ismei et al. (2015); Putri & Soelistyo (2018) on their research that investment has a positive and significant effect on employment. In contrast to their research, Sandika, Maulida, & Setiawan (2014); Wijaya (2014) research found that investment has no significant effect on employment. Data from the BPS shows that the value of investment realization in domestic investment increases every year. It was 128,150.6 billion rupiahs in 2013 and increased to 156,126.3 billion rupiahs in 2014, 179,466.9 billion rupiahs in 2015. In addition, it was 216,230.8 billion rupiahs of investment in 2016 and 262,350.5 billion rupiahs in 2017 (BPS, 2018b, 2018e). It is expected that the increase in investment every year can

increase the number of companies. This will increase the output which results in the increase of labor demand reduce unemployment (Matz & Usry, 2003).

Besides investment, the change of technology also has an impact on employment (Maselli, 2012). It can substitute or complement the role of the workforce. As labor's substitution, technology replaces the need for labors that must be employed by the company or employer which results in a decrease in labor demand. In addition, based on the empirical result of a study, it finds that technology also acts as a complement to labor. This fact will increase labor demand for this type of work. More and better technology will increase the demand for skilled labor in their use to increase the productivity of the company (Greenlaw & Shapiro, 2011).

The quality of human resource in a country supports labor absorption in every sector. Ardiansyah, Rochaida, & Lestari (2017); Buchari (2016) present the result of their research that education has a positive and significant effect on employment. It means that if there is an increase in education, employment will also increase.

According to BPS (2015), the manufacturing industry is an economic activity carried out to change raw material mechanically, chemically or by hand to become half-finished or finished goods. It also changes the less value goods to higher ones and closer to end users. Industrial service is included in this activity. In an industrial service, there are companies or industrial businesses, which their business units carried out economic activities with the aim of producing goods or services, are located in a particular building or location and have separate administrative records about their production and cost structure. They also have people who are responsible for their business. In Indonesia, industrial business activities can be in a (1) small industry; (2) medium industry; and (3) large industry. This article only focuses on the medium and large scale of the manufacturing industry. The result of the study will be presented based on the calculation result obtained from the variables simultaneously or partially.

III. Method

This is a secondary data analysis of labor absorption which focuses on the influential factors on it. It focuses only on labor absorption of medium and large the manufacturing industry sectors in Indonesia. This study uses panel data which is the combination of time-series data and cross-section data (Gujarati & Porter, 2015). The time series data used are from 2010-2017 and the cross section data used are provinces in Indonesia which include 34 provinces. They are processed using EViews 9 and are obtained from Statistics of Indonesia (BPS).

In analyzing the data, the researcher uses descriptive quantitative data analysis. Descriptive analysis is used to describe the general problem. It discusses the existing data which are related to the actual situation. Meanwhile, the quantitative analysis is used to determine the effect of the independent variables on the dependent variable. The equation model used in this study is as follows:

$$LTK_{it} = \alpha_0 + \alpha_1 LINDUS_{it} + \alpha_2 LPDRB_{it} + \alpha_3 LINV_{it} + \alpha_4 LUMP_{it} + \alpha_5 EDU_{it} + \alpha_5 TECH_{it} l + \varepsilon_{1it}$$

LTK_{it} is labor absorption which is proxied by the number of labor in the industrial sector (in person); $LINDUS_{it}$ is the number of industrial companies (in unit) variable. $LPDRB_{it}$ is stated as the Gross Regional Domestic Product (hereafter (GRDP) in million of Rupiahs); $LINV_{it}$ stands for the investment value proxied in investment realization calculation of the domestic

investment (in billion of Rupiahs); $LUMP_{it}$ is the variable of wage which is proxied by provincial minimum wage (in Rupiah); EDU_{it} is the variable of education proxied in the average calculation of study at school for each province (in year); $TECH_{it}$ is the variable of technology proxied by the development of Science and Technology Index (in index); α_0 is constant; $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ is the coefficient of the study; i is unit data; and t is period of time.

Table 3. Description of Operational Variables on Labor Absorption Analysis

Dependent Variable	
Labor Absorption	The number of labors demanded by companies in producing goods. The data used to measure labor absorption in Indonesia are data on the number of labors in the medium and large industrial sector in every province in Indonesia.
Independent Variables	
Number of industrial companies	The number of medium and large the manufacturing industry companies in every province in Indonesia. The data are the number of medium and large-sized industrial companies in every province in Indonesia.
Gross Reinal Domestic Product (GRDP)	The aggregate of added data value produced by all business units in an area or the total value of all final goods and services produced by all economic units in an area. The data are GDP at a constant price for particular years.
Investment Value	The spending value or investment to buy capital goods and production equipment to produce more, better goods and services available in the economy. The data are the value of domestic investment realization in each province in Indonesia.
Labor Wages	The honorarium for services given by labors to the medium and large the manufacturing industries in various provinces in Indonesia. The data used are the Provincial Minimum Wage (UMP) per month set by each province in Indonesia.
Education	An element of human the development used to measure the dimension of knowledge of the residents. The data used are the average length of schooling in formal education of the residents aged from 15 years old and over.
Technology	Overall means used to provide for the need of a human to survive. The data are Science, Technology, Information and Communication Index (hereafter IP-TIK) which is a standard measurement that can be used to describe the level of technological and information the development in a region.

Source: Research Design Result

IV. Result and Discussion

In determining the right regression model, the researcher conducts the Chow test, Hausman test, and Lagrange multiplier test.

Tabel 4. Chow Test

Effect Test	Statistic	d.f.	Prob.
Cross-section F	49.233296	(33,125)	0.0000
Cross-section Chi-square	435.416054	33	0.0000

Source: Output of EViews 9

Table 4 presents the result of the Chow test with the Chi-square's cross-section probability value is 0.0000. A smaller probability value of 0.05 indicates that Ho is rejected, which means that the best model is the fixed effect model.

Tabel 5. Hausman Test

Effect Test	Statistic	d.f.	Prob.
Cross-section random	3.377864	6	0.7601

Source: Output of EViews 9

Table 5 presents the result of the Hausman test with a random cross-section probability value is 0.7601. This value is greater than 0.05 indicating that Ho is accepted, which means the best model is the random effect model. Based on the result of the Chow test, it shows that the best model is the fixed effect model while the Hausman test shows the best model is the random effect model, therefore Lagrange multiplier test is needed.

Tabel 6. Lagrange Multiplier test

	Cross-section	Test Hypothesis Time	Both
Breusch-Pagan	255.9131 (0.0000)	1.700793 (0.1922)	257.6139 (0.0000)

Source: Output of EViews 9

Table 6 shows that the Lagrange multiplier test with both values in the Breusch-Pagan test is smaller than 0.05. Therefore, it can be concluded that, based on the Lagrange multiplier test, the best model is the random effect model. The further testing process is the classical assumption test with random-effect model. The classic assumption test used in linear regression with Ordinary Least Squared (OLS) approach includes linearity, autocorrelation, heteroscedasticity, multicollinearity, and normality (Gujarati & Porter, 2010). However, the researcher must not conduct all of those classic assumption tests in every linear regression model with the OLS approach (Basuki & Yuliadi, 2015). It is because of several following reasons: (1) all of those linearity tests are hardly carried out on every linear regression model because it has already been assumed that the model is linear; (2) normality test is basically not a BLUE (Best Linear Unbias Estimator) requirement and some experts state that it is not a requirement which must be fulfilled; (3) Autocorrelation only occurs in time series data; (4) multicollinearity needs to be conducted when linear regression uses more than one independent variables. If there is only one independent variable, multicollinearity is not possible to do; (5) heteroscedasticity usually occurs in cross-section data in which the panel data are closer to the cross-section data compared to time series data. Therefore, it can decide that the researchers will conduct the classical assumptions test of normality, multicollinearity, and heteroscedasticity.

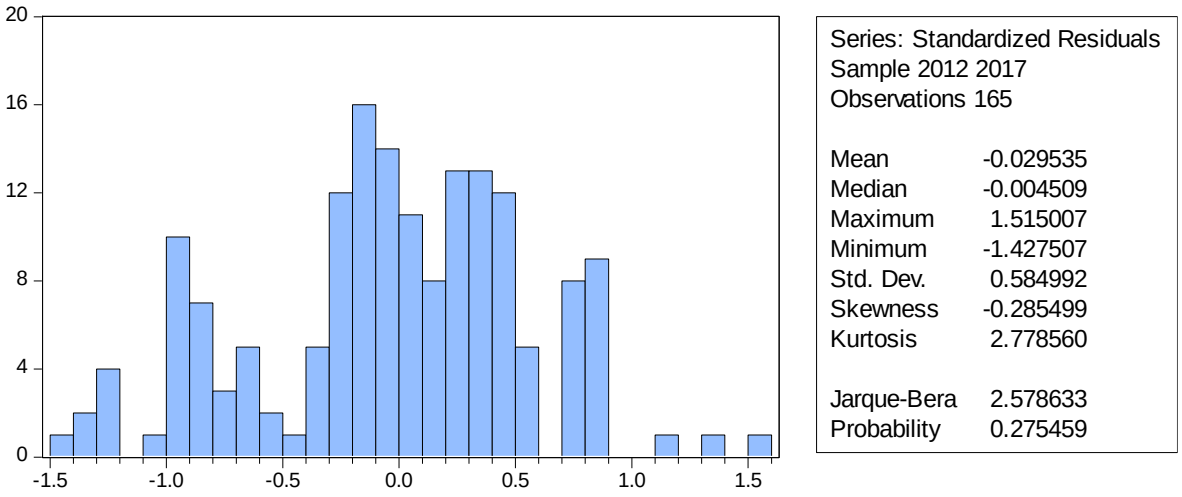

Figure 1. Normality Test Result

Source: Output of EViews 9

Based on the result of the normality test, the probability value is 0.275459> 0.05. Therefore, it can be concluded that the data in this study are normally distributed. The next test is a multicollinearity test. The test result is presented in the following table.

Table 7. Multicollinearity Test

	LTK	LINDUS	LPDRB	LINV	LUMP	EDU	TECH
LTK	1.000000	0.893216	0.858213	0.643620	-0.173446	0.262745	0.481756
LINDUS	0.893216	1.000000	0.730125	0.522247	-0.242897	0.220274	0.383558
LPDRB	0.858213	0.730125	1.000000	0.744098	-0.048429	0.221594	0.449094
LINV	0.643620	0.522247	0.744098	1.000000	0.074381	0.073077	0.286968
LUMP	-0.173446	-0.242897	-0.048429	0.074381	1.000000	0.375516	0.249988
EDU	0.262745	0.220274	0.221594	0.073077	0.375516	1.000000	0.738562
TECH	0.481756	0.383558	0.449094	0.286968	0.249988	0.738562	1.000000

Source: Output of EViews 9

From the result of multicollinearity test, it can be seen that there are multicollinearity problems in regression model on LINDUS and LPDRB variables because the correlation coefficient among the independent variables are greater than 0.80 which are 0.893216 and 0.858213.

Table 8. Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.717569	1.461825	1.859025	0.0649
LINDUS	-0.009182	0.056609	-0.162196	0.8714
LPDRB	-0.093722	0.089086	-1.052035	0.2944
LINV	-0.001746	0.012064	-0.144729	0.8851
LUMP	-0.127126	0.104517	-1.216310	0.2257
EDU	0.057120	0.067113	0.851108	0.3960
TECH	0.059199	0.040452	1.463428	0.1453

Source: Output of EViews 9 (analyzed data)

From the result of the heteroscedasticity test, it shows that every independent variable has a probability value of more than 0.05. It means that every variable is free from assumption violations heteroscedasticity. After testing the classical assumptions, statistical tests on the formed regression model are conducted.

Table 9. Statistical Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.393325	1.280646	2.649698	0.0089
LINDUS	0.596160	0.057713	10.32980	0.0000
LPDRB	0.682706	0.108422	6.296763	0.0000
LINV	-0.009878	0.014538	-0.679441	0.4979
LUMP	-0.363924	0.096106	-3.786690	0.0002
EDU	0.063513	0.108288	0.586521	0.5584
TECH	0.098020	0.048688	2.013233	0.0458
Adjusted R-squared	0.680323			
Prob(F-statistic)	0.000000			

Source: Output of EViews 9

Hypothesis testing is done by carrying out a statistical test with the significance of the coefficient of the variable. Table 9 shows us that the Adjusted R-squared value is 0.680323. It means that 68% of the dependent variable, labor absorption (LTK), can be explained by independent variables with a statistical model. Those dependent variables are the number of industrial companies, gross regional domestic, investment value, wages, education, and technology. Meanwhile, the remaining 32% is explained by other factors outside the model.

After conducting a hypothetical test, a simultaneous significance test or F test is fulfilled. Based on the test result, the Prob value (F-statistic) is 0.000000 <0.05 which means that the independent variables simultaneously have significant effect on the dependent variable. The constant value of 3.393325 can be interpreted that the number of industrial companies, gross regional domestic, investment value, wage, education, and technology are all constant. In addition, the value of labor demand in medium and large the manufacturing industry sector is 3 people.

The next test is the t-test. It is used to test the regression coefficient individually. We can see from table 9 that the number of industrial company variable has a probability value of 0.0000 <0.05 with a coefficient value of 0.596160. It can be concluded that the number of industrial company has a positive and significant effect on labor absorption in the medium and large the manufacturing industries in Indonesia. Furthermore, GRDP variable has a probability value of 0.0000 <0.05 with a coefficient value of 0.682706, so it can be concluded that the GRDP has a positive and significant effect on labor absorption in the medium and large the manufacturing industries in Indonesia. In addition, the investment value variable has a probability value of 0.4979> 0.05 with a coefficient value of -0.009878, it can be concluded that the proxied investment value in investment realization calculation of domestic investment does not significantly influence the labor absorption in medium and large the manufacturing industry in Indonesia. The next variable is wage. The proxied variable of provincial minimum wage calculation has probability value of 0.0002 <0.05 with coefficient value of -0.363924. It can be concluded that the wage variable has a negative and significant effect on labor demand in the medium and large the manufacturing industry sector in Indonesia. Moreover, the education variable which is proxied in calculation of the average length of school has a probability value of 0.5584> 0.05 with a coefficient value of 0.063513.

It can be concluded that education variable has no significant effect on labor absorption in the medium and large manufacturing industry in Indonesia. The last variable is technology. This variable has a probability value of 0.0458 <0.05 with coefficient value of 0.098020, so it can be concluded that proxied technology in the calculation of IP-TIK has a positive and significant effect on labor absorption in medium and large the manufacturing industry in Indonesia.

4.1 The Effect of the Number of Industrial Company on Labor Absorption

An industrial company or business is a business unit that carries out economic activities. It aims to produce goods or services. It is located in a certain building or location and. It has its own administrative record of production and cost structure and there are one or more than one people who are responsible for the business these (Statictis Indonesia, 2019). Based on the test result, it shows that the number of industrial company variable has a positive and significant effect on labor absorption in the medium and large the manufacturing industry sector in Indonesia in 2010-2017. The finding in this study is in line with Ismei et al.'s (2015) research. It also in line with theory which states that the increasing number of companies which produce a certain product will also increase labor absorption and vice versa (Greenlaw & Shapiro, 2011).

4.2 The Effect of Gross Regional Domestic Product on Labor Absorption

According to the Directorate of Economic and Monetary Statistics, GRDP is one of the important indicators to determine the economic condition in an area in a period of time. It is both on a current basic price and on a constant basic price. GRDP is basically the total of the added value generated by all business units in a particular region or is the total value of goods and final services produced by all economic units in a region.

Based on the test result, it shows that the GRDPvariable has positive and significant effect on labor absorption in the medium and large manufacturing industries in Indonesia in 2010-2016. This finding is in line with the Budiarto & Dewi (2015); Ziyadaturrofiqoh et al.'s research (2018), which states that GRDP has a partially positive and significant effect on labor absorption. GRDP is assumed to increase if the total value of output or production sale of economic units in an area or region increases. Greater output or sales made by the company will encourage them to hire labor to increase production and sale. Therefore, labor demand will increase (Boediono, 2009).

4.3 The Effect of Investment Value on Labor Absorption

Investment is a step of sacrificed consumption of the future. It includes capital addition or goods in a country such as building, production equipment, and inventory item within a year (Samuelson & Nordhaus, 2004). Investment is also defined as expenditure to buy capital goods and production equipment with the aim of replacing and adding capital goods in the economy which are used to produce goods and services in the future (Sukirno, 2007).

Based on the test result, it shows that the investment value variable proxied to the realization of the domestic investment in every province in Indonesia does not have a significant effect on labor absorption in the medium and large the manufacturing industries in Indonesia in 2010-2016. The finding of this study is not in line with the finding of Arida, Zakiah, & Julaini (2015); Bashier & Wahban (2013); Chusna (2013); Ismei, Wijarnako, & Oktavianti (2015); Putri & Soelistyo (2018) research that investment has positive and significant effect on labor demand. On the other hand, this research is in line with research

written by Sandika, Maulida, & Setiawan (2014); Wijaya (2014) that investment has no significant effect on labor demand. The condition of domestic investment realization in industrial sector in Indonesia in 2017 was decreased by 7,596.7 billion Rupiahs.

4.4 The Effect of Wage on Labor Absorption

According to the Act of the Republic of Indonesia Number 13 of 2003 on Manpower, wage is the right of the workers / labor received and expressed in the form of money as compensation from the entrepreneur or employer to worker / labor who is determined and paid according to a work agreement, a deal, or law and regulation, including allowances for worker / labor and their family for a job and / or service that have been or will be done. Meanwhile, labor demand is the relationship between the level of wage and the number of requested workers in which the relationship is both negatives (Greenlaw & Shapiro, 2011; Santoso, 2012).

The test result shows that the proxied wage variable in the calculation of provincial minimum wage has a negative and significant effect on labor demand in the medium and large the manufacturing industry sector in Indonesia in 2010-2017. This finding is in line with the study of Wihastuti & Rahmatullah (2018) that wage positively and significantly influences labor demand in the province of Riau. On the other hand, study of Arida, Zakiah, & Julaini (2015); Buchari (2016); Budiarto & Dewi (2015); Wijaya (2014); Ziyadaturrofiqoh, Zulfanetti, & Safri (2018) find that the provincial minimum wage variable has a negative effect on labor absorption and does not have a significant effect on it. The result of this study is in line with theory that a change in wage will result in the shift of labor demand. It means that if the level of wage increases, the amount of labor demand will decrease and if the level of labor wage decreases, the amount of labor demand will increase (Greenlaw & Shapiro, 2011; Santoso, 2012).

4.5 The Effect of Education on Labor Absorption

Based on BPS on education in 2018, the average length of school is in line with the level of education. The longer they study at school, the higher level of education they will have. By referring to this indicator, it can be seen the level of education of Indonesian people aged from 15 years old and over.

The test result shows that the education variable proxied in the calculation of the average length of school aged from 15 years old and over in the formal education has no significant effect on labor absorption in the medium and large the manufacturing industry in Indonesia in 2010-2017. The result of this study is not in line with the study of Ardiansyah, Rochaida, & Lestari (2017); Buchari (2016) which finds that education has a positive and significant effect on labor absorption. It means that if there is an increase in education level, the labor absorption will also increase. Education plays an important role in increasing human resources. Based on BPS on education in 2018, the average length of school is in line with the level of education. The longer they study at school, the higher level of education they will have. By referring to this indicator, it can be seen the level of education of Indonesian people aged from 15 years old and over. Since 2015, the average length of school increases every year. In 2018, it has reached the highest point of 8.58 years or equivalent to the second grade of junior high school or the equivalent. However, this does not meet the target of the Ministry of Education and Culture's Strategic Plan, that is, 8.7 years. The province with the highest average length of school is Jakarta. Jakarta has reached 11.02 years. On the opposite, the lowest average length of school was Papua. Hard-working and synergy of all parties are needed to meet the target that human resources in Indonesia can be competitive.

4.6 The Effect of Technology on Labor Absorption

The power of technology including digitalization and automation continues to grow and change the pattern of production, distribution, and consumption. The International Telecommunication Union in the Measuring Information Society Report 2017 announces that Indonesia ranked114 in 2015. And it was up to 111 in 2017. Indonesia is among the top 10 most dynamic countries to increase the value of IP-TIK from 3.85 in 2015 to 4.33 in 2017 (BPS, 2017).

The test result shows that the proxied technology variable in the calculation of IP-TIK (Information, Communication, and Technology Development Index) has a positive and significant effect on labor demand in the medium and large the manufacturing industry sectors in Indonesia in the years of 2010-2017. The finding in this study is in line with the study written by Bresnahan, Brynjolfsson, & Hitt (2002) explaining that technology has a positive and significant effect on change in labor demand, especially the skilled labor. The effect of technology on labor demand will be greater when it is combined with the company's investment. Labors who can no adapt to changes in the existing technology will not attract the company to use them (Greenlaw & Shapiro, 2011; Maselli, 2012). The technological the development in Indonesia has increased every year, although there are also a number of provinces whose technology the development value is still below the technological, information and communication the development index in Indonesia.

V. Conclusion

Based on the research finding and discussion, it can be concluded that the independent variables such as wage, number of industrial company, GRDP, investment value, technology, and education have a significant effect on the dependent variable--labor absorption in the medium and large the manufacturing industry sector in Indonesia in the years of 2010-2017. Partially, the wage variable has a negative and significant effect on labor absorption in medium and large the manufacturing industries in Indonesia in the years of 2010-2017 in Indonesia while the number of industrial companies, GRDP, and technology have a positive and significant effect on it. In addition, the investment value variable and education do not have a significant effect on labor absorption in the medium and large the manufacturing industries in Indonesia in the years of 2010-2017 in Indonesia. The result of the study is expected to be taken into consideration in determining policies to improve the quality of human resources, technology, industrialization process, and industrial the development. The improvement is, especially, related to labor absorption to increase their welfare, economic activity and opportunity so that the people can achieve a higher standard of living.

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