Absorption of Indonesian Workers in the Industrial Sector by Significant Province

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Abstract—**Using panel data from 2010-2016 from the national and provincial Statistic Agency, this study aims to formulate a model of industrial sector employment that is generated by the Gross Domestic Regional Product of the industrial sector, per capita Gross Domestic Regional Product and provincial minimum wages and to identify the magnitude of the influence and contribution. The analysis used is explorative analysis of data mining (data mining) and econometric analysis of panel data modeling. From the results of the analysis, the right model to explain labor absorption in the industrial sector is the fixed effect model, and from 33 (thirty-three) pieces of the provincial fixed effect model, 16 (sixteen) provinces were identified as statistically significant at the 0.05 level. Of the sixteen significant provincial models, if grouped according to the value of intercept values, they can be grouped into three groups, namely the first group with relatively high intercept values, there are 5 (five) provinces, including West Java province; Central Java; East Java; Banten; and DKI Jakarta. The second group with intercept value is 6 (six) provinces, namely North Sumatra province; South Kalimantan; Lampung Bali; Riau islands; and Yogyakarta. The third group with relatively low intercept values is 5 (five) provinces, namely the province of South Sulawesi; West Nusa Tenggara; South Sumatra; Boast; and East Nusa Tenggara.**

Keywords—fixed effect model; employment; Gross Domestic Regional Product industry sector; provincial minimum wage

I. INTRODUCTION

The economic progress of a nation can be observed from how much the industrial sector contributes to its economic growth, because industry is synonymous with added value, technology transfer and employment as a precondition for economic growth. In some countries that are classified as advanced, the role of the industrial sector is more dominant than other sectors, the industrial sector plays a key role as the engine of its economic development. Historical data on China and South Korea, shows that industrialization is a key word in boosting economic progress. Industrialization, in addition to increasing investment inflows, will also open new jobs as widely as possible and create a multiplier effect in the trade sector. The strategic role of the industrial sector as an engine of economic development, because the industrial sector will bring derivative impacts, namely the increase in the value of capital capitalization, the ability to absorb a large workforce, and the ability to create added value from every input or basic material processed [1].

There are three main reasons the industrial sector is the key sector for economic development and growth. First, industry is the only economic sector that can generate the greatest added value and means the biggest contributor to growth. Second, industry can be as a puller or a driver for the development and growth of output in other economic sectors. Third, industry is the most important sector for technological development which can then be spread through spillover effects to other sectors. This has been proven by countries experiencing industrial revolution which tend to increase rapidly in economic growth [2]. But the low absorption of labor in the Indonesian industrial sector has not been able to make the industrial sector as a way out to overcome the problem of unemployment. From several studies on the effect of wage levels on labor demand, shows a negative influence. Research results on the effect of economic growth; Minimum wages and investment in employment in Malang City, concluding that the higher economic growth will result in higher employment [3]. From the regression analysis obtained information, increasing economic growth by 1 percent will result in an increase in employment of 0.014 percent. In the second model, related to the effect of the minimum wage on employment opportunities, information on the increase in minimum wages can lead to a decrease in employment. From the regression analysis, increasing the minimum wage by 1 percent will result in a decrease in labor absorption by 0.196 percent. Research on the furniture industry in Pedurungan Sub-district, Semarang City, results show that the furniture industry contributes in terms of employment. However, the absorption of its workforce is not proportional to the value of the investment; wage value and production value [4]. Based on the results of the regression analysis obtained the R-square value of 0.777 which shows that the influence of the investment value, wage value and production value on the absorption of the furniture industry workforce in Pedurungan District, Semarang City is 77.7%. From the results of this study concluded that there is a positive influence on investment value, wage value and production value on employment in the furniture industry in Pedurungan District, Semarang City. Other research on the effect of minimum wages on labor demand in Indonesia [5]. Using 1990 data, researchers found that there were two different balances in the labor market. On the one hand, the formal sector with high wages and high labor demand. While

on the other hand, wages in the informal sector are low with also low labor demand. However, this condition only occurs in the non-tradable industrial sector.

In recent years the ability of the industrial sector to absorb labor continues to decline. This condition is not in line with the expectations of the industry as a growth engine and a sector with a large share in absorbing labor. Several factors are considered to have great influence on the employment capacity of the industrial sector, including the growth of industrial sector production, people's per capita income and wages. So that in this study the indicators that can represent the aforementioned factors will be examined in order to determine the effect on the employment of the industrial sector in Indonesia. These indicators are the Gross Domestic Regional Product of the industrial sector; Gross Domestic Regional Product per capita; and Provincial Minimum Wages. So based on the theory and facts and the results of several studies that have been conducted, this study aims to formulate a model of employment in the Indonesian industrial sector generated by the variable Gross Domestic Regional Product in the industrial sector; Per capita Gross Regional Domestic Population and Provincial Minimum Wage according to the province's absorption group.

II. Method

The analytical method used in this research is explorative descriptive analysis and quantitative statistical analysis using econometric modeling panel data on Gross Domestic Regional Product development; Gross Domestic Regional Product per capita; Provincial Minimum Wages; and employment of the industrial sector in all provinces in Indonesia. The panel data of the four research variables that will be estimated in the model form are first analyzed exploratively descriptive, then proceed to the data panel modeling stage (model estimation) employment in the industrial sector accompanied by evaluation of the model (selection of the best model) based on three evaluation criteria namely the criteria of economic theory; statistical criteria; and econometric criteria.

Panel data modeling basically produces 3 (three) models, namely panel data regression model (Pooled regression OLS); fixed effect model (Fixed effect model); and a random effect model (Random effect model). However, from the three models, one model will be obtained that matches the data structure of the research object panel [6-9]. Thus in this study all possible models will always be estimated and analyzed which are then compared with each other using the model evaluation criteria, namely the criteria of economic theory; statistical criteria; and econometric criteria. After obtaining the best model, then simulating the results of the provincial model which is truly statistically significant to determine the provincial grouping based on the level of employment in the industrial sector is carried out.

III. Result and Discussion

The results of explorative and descriptive analysis of the panel data relationship between the dependent variables of industrial labor absorption with the three panel model independent variables that will be analyzed. Early indications

are obtained that the panel data model that will be produced is likely not to be in the form of a regular panel regression model or pooled ordinary least square (OLS). This is indicated by the pattern of data distribution which tends to cluster according to the province group. Then the model that will be produced after estimation can be ascertained in the form of other panel data estimation models, and of course it will be a bit complicated in carrying out the analysis. This is because it is also supported by the results of calculating the correlation value between the pairs of variables, both the correlation between the dependent variables and the independent variables and between the pairs of independent variables indicated there is a problem of heteroscedasticity. From the results of the correlation analysis, information is obtained that a large and significant correlation value occurs in the dependent variable of the Industrial Sector Labor Absorption (TKIND) with an independent variable of the Industrial Domestic Gross Product (PDRBIND) of 0.92 (significant). While the correlation value between the independent variable pairs is below 0.5 and there are 3 (three) significant pairs, namely the Gross Domestic Regional Product per capita with the provincial Minimum Wage of 0.46; Gross Domestic Regional Product per capita with Gross Domestic Regional Product in the industrial sector of 0.22; and the Provincial Minimum Wage with an industrial Gross Domestic Regional Product of 0.15. But in this case the information that can be learned that between independent variables is indicated to be free from the existence of multicollinearity. Data is said to be identified as multicollinearity if the correlation coefficient between independent (independent) variables is more than 1 or equal to 0.8 [10]. Specifically, it will be discussed in the discussion of assumptions that must be met by the model.

The results of the modeling analysis showed that the Indonesian industrial sector labor absorption model (TKIND) was generated by the industrial sector Gross Domestic Regional Product (PDRBIND); Gross Domestic Regional Product per capita (PDRBCAP); and Provincial Minimum Wages (UMP) as predictor variables. Based on the equation (1) the model is the Fixed Effect model with the general equation model (baseline) is: /

$$
\begin{aligned}
TKIND_1 = {} & \mathbf{0.4466 + 0.0005*PDRBIND_i + 0.0029*PDRBCA_i\text{-}} \\
& \text{(SE:0.0002) (SE: 0.0013)} \\
& \text{(P<0.014)*(P<0.025)*} \\
& \mathbf{0.0003*\ UMP_i + u_i*DPROV_i} \\
& \text{(SE: 0.0003)} \\
& \text{(P<0.206)} \\
& \text{(P<0.000)***; R}^2 = 0.9904
\end{aligned} \tag{1}
$$

Fixed Effect model is the best model when compared to 2 (two) other models, namely Pooled regression model and Random effect model.

Simultaneously at a significance level of 0.05, Gross Domestic Regional Product in the industrial sector; Gross Domestic Regional Product per capita; and the Provincial Minimum Wage affects the absorption of the Indonesian industrial sector's workforce through a functional effect model (Fixed effect model). As much as 99.04 percent of the variance in the absorption of labor in the industrial sector can be explained by the variance of Gross Domestic Regional Product in the industrial sector; Gross Domestic Regional Product per capita; and Provincial Minimum Wages. While the remaining

0.96 percent is explained by the variance of other independent variables not included in the modeling. And partially the Gross Domestic Regional Product of the industrial sector had a significant effect on the 0.05 level of significance (P <0.014) with the standard error of SE = 0.0002 on the absorption of industrial sector labor. Gross Domestic Regional Product per capita significantly affected 0.05 significance level (P <0.025) with SE = 0.0013 standard error on industrial sector labor absorption, while provincial minimum wage did not have a significant effect on 0.05 significance level (P <0.260) with SE error standard = 0.0003 for industrial sector employment absorption.

In the Fixed effect model displays a model for each province, namely 33 (thirty-three) provinces and statistically significant 16 (sixteen) provinces. The baseline model can be used as a representative of the 33rd (thirty-three) provinces because the results of the modeling analysis of the Fixed effect of the provincial model are only produced in 32 (thirty-two) provinces out of the 33 (thirty-three) provinces analyzed. This happens because according to his theory is intended to avoid or reduce the problem of multicollinearity. The statistical form of each province is statistically significant, including:

TABLE I.   FIXED EFFECT MODEL OF 16 PROVINCES

Province	Model
North Sumatera	$TKIND_{provinsi-02}=0.8867+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
West Sumatera	$TKIND_{provinsi-04}=0.5909+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
South Sumatra	$TKIND_{provinsi-06}=0.6185+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Lampung	$TKIND_{provinsi-08}=0.7978+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Riau Islands	$TKIND_{provinsi-09}=0.7347+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Jakarta Capital Special Region	$TKIND_{provinsi-11}=1.1478+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Banten	$TKIND_{provinsi-12}=1.6124+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
West Java	$TKIND_{provinsi-13}=4.1126+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Central Java	$TKIND_{provinsi-14}=3.5877+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Yoyakarta	$TKIND_{provinsi-15}=0.7198+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
East Java	$TKIND_{provinsi-16}=3.1703+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
South Kalimantan	$TKIND_{provinsi-18}=0.7882+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
South Sulawesi	$TKIND_{provinsi-23}=0.6622+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Bali	$TKIND_{provinsi-27}=0.7533+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
West Nusa Tenggara	$TKIND_{provinsi-28}=0.6463+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
East Nusa Tenggara	$TKIND_{provinsi-29}=0.5743+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$
Baseline	$TKIND_{provinsi-33}=0.4466+0.0005*PDRBIND+0.0029*PDRBCAP-0.0003*UMP$

Source : Pool Data from E-Views

TKIND   = Industrial Sector Labor Absorption
PDRBID   = Sector Gross Domestic Regional Product
PDRBCAP   = Gross Domestic Regional Product Per Capita
UMP   = Provincial Minimum Wages

From the sixteen provincial fixed effect models it can be identified that the level or magnitude of industrial sector labor absorption is largely determined by the size of the intercept model because the slope of each model of magnitude is the same. So that for the sixteenth this provincial model if grouped according to the intercept value, it can be grouped into three groups, namely the first group with relatively high intercept value 1.0 ep intercept   4.1) there are 5 five) provinces, among others, West Java province; Central Java; East Java; Banten; and DKI Jakarta. The second group with intercept value 0.7 ep intercept <1.0) there are 6 six) provinces namely North Sumatra province; South Kalimantan; Lampung; Bali; Riau islands; and Yogyakarta. Finally, the third group with relatively low intercept values, namely 0.5   intercept <0.7) there are 5 five) provinces, namely the province of South Sulawesi; West Nusa Tenggara; South Sumatra; Boast; and East Nusa Tenggara.

The relationship between the Gross Domestic Regional Product of the industrial sector ceteris paribus and the absorption of labor in the provincial industrial sector group 1.0 1.0 intercept   4.1). West Java Province has the highest interception followed by Central Java province; and East Java. Similarly, if it is identified from the value of the Gross Domestic Regional Product Industry, the order is the same for the three provinces. While the other two provinces are Banten; and DKI Jakarta was identified that the province of Banten had a larger interception value than the province of Khus in the capital city of Jakarta. This indicates that employment in the industrial sector in Banten province is higher than in DKI Jakarta province, even though the Gross Domestic Regional Industrial Product value for DKI Jakarta province is greater than Banten province. The relationship between the Gross Domestic Regional Product of the ceteris paribus industry and the provincial industrial sector employment absorption 0.7 intercept <1.0). North Sumatra province is the highest intercept compared to five other provinces which indicates that the employment rate of the industrial sector in North Sumatra province is higher than the five provinces, namely the province in sequence after North Sumatra province is Lampung province; South Kalimantan; Bali; Kepri; and Yogyakarta. Whereas if it is identified based on the value of the Gross Domestic Regional Product of the industry, the order is the province of North Sumatra; Riau Islands; Lampung South Kalimantan; Yogyakarta; and the province of Bali. And the relationship between the Gross Domestic Regional Product of the ceteris paribus industry and the provincial industrial sector employment absorption 0.5   intercept <0.7), namely the South Sumatra and South Sulawesi provinces are the same intercept and the highest when compared to the other three provinces which indicate that the industrial sector employment rate in the provinces of South Sumatra and South Sulawesi are higher than the three provinces, namely the province in sequence after the provinces of South Sumatra and South Sulawesi are West Nusa Tenggara provinces; Boast; and East Nusa Tenggara. Whereas if it is identified based on the value of the Gross Domestic Regional Product of the industry, the order is the

province of South Sumatra; South Sulawesi; Boast; West Nusa Tenggara; and East Nusa Tenggara province.

IV. CONCLUSION

Indonesian industrial sector labor absorption model generated by the Gross Domestic Regional Product of the industrial sector; Gross Domestic Regional Product per capita; and the Provincial Minimum Wage as a predictor variable, the model is the Fixed Effect model. And from 33 (thirty-three) Fixed effect models the province is statistically significant at the 0.05 level as many as 16 sixteen) provinces, including North Sumatra province; Boast; South Sumatra; Lampung Riau islands; DKI Jakarta; Banten; West Java; Central Java; Yogyakarta; East Java; South Kalimantan; South Sulawesi; Bali; West Nusa Tenggara; and East Nusa Tenggara.

In the econometric model, the employment of the industrial sector is largely determined by the value of the intercept model, so that for the sixteen significant provincial models, if grouped according to the intercept value, they can be grouped into three groups. That is the first group with relatively high intercept values 1.0 ep intercept   4.1) there are 5 five) provinces, including West Java province; Central Java; East Java; Banten; and DKI Jakarta. The second group with intercept value 0.7 0.7 intercept <1.0) there are 6 six) provinces namely North Sumatra province; South Kalimantan; Lampung Bali; Riau islands; and Yogyakarta. Finally, the third group with relatively low intercept values, namely 0.5   intercept <0.7) there are 5 five) provinces, namely the province of South Sulawesi; West Nusa Tenggara; South Sumatra; Boast; and East Nusa Tenggara.

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