CHAPTER IV

RESULT AND DISCUSSION

This research was conducted in order to find out and analyze the factors that may affect the labor absorption in rubber production. The variables included in this research were the rubber production, the size of rubber plantation area, provincial minimum wage, and the number of company. This research sought the effect of those variables on the labor absorption in each province in particular period of time. Moreover, the research covers several provinces in Indonesia that categorized as the central of rubber plantation in Indonesia, such as; North Sumatera, South Sumatera, Riau, Lampung, West Java, West Kalimantan, Central Kalimantan, South Kalimantan, Aceh, and East Java. Since the research covered several provinces in some particular years, the writer used panel data regression in order to see the behavior of each variable.

1.1. Panel Data Regression

1.1.1. Models used in panel data regression

In this research, there were several models that the writer used in order to see the behavior of each variable, they were;

a. Common Effect Model

Common Effect Model is a test that uses Ordinary Least Square Method (OLS). In this model, it is assumed that both intercept and slope are good between regions and in the certain time.

b. Fixed Effect Model

Fixed Effect Model is a test that conducted based on the existence of differences between provinces or years.

c. Random Effect Model

Random Effect Model is test that conducted based on the existence of differences of intercept and constant. These differences are caused by the residual error as the result of differences in provinces and time period.

The estimation result of these 3 models can be seen as follows:

Table 4.1 Estimation Result Common Effect, Fixed Effect, and Random

Independent Variables	Common Effect Model		Fixed Effect Model		Random Effect Model	
	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
Constant	-6.036227	0.1798	-2.284323	0.5140	-3.658981	0.2795
LOG(production)	-0.175788	0.6481	-0.239307	0.4346	-0.188267	0.5240
LOG(area)	0.426070	0.3095	0.357046	0.3110	0.348688	0.2943
LOG(ump)	0.748298	0.0387	0.642018	0.0329	0.690604	0.0150
LOG(company)	0.705953	0.0000	0.465839	0.0000	0.531845	0.0000
R-Squared	0.737831		0.905502		0.605556	
Prob (F-Statistic)	0.000000		0.000000		0.000001	

Source: Secondary data processed, 2018

Based on the table, it can be seen in the Common Effect Model that two variables; X3 (Provincial Minimum Wage) and X4 (The Number of Company) affect the dependent variable (Labor Absorption) significantly and the other tow; X1 (Rubber Production) and X2 (The Size of Plantation Area) did not affect the dependent variable (Labor Absorption) significantly. However, the probability F-Statistic showed that all the variables would significantly affect the labor absorption in all the researched provinces together. Moreover, the R-Squared showed the number of 73.78% which means that the changes in the labor absorption were caused by the number of producer, rubber production, area of production, and provincial minimum wage and they covered around 73.78% and the rest can be affected by other variables.

In Table 4.1, it showed that the result for Fixed Effect Model as well. According to this model, provincial minimum wage and the number of company were significantly affected the labor absorption while the others did not affect the labor absorption significantly. From the probability F-statistic that showed the number of 0.000000, it means that all the variables could together affect the labor absorption significantly. The R-Squared showed 90.55% which means that all the variables; the number of producer, rubber production, area of production, and provincial minimum wage could affect the labor absorption of around 90.55% and the rest would be the other variables.

According Table 4.1, the result of random effect model was not far different from the other models. In the random effect model, two independent variables; provincial minimum wage and the number of company affected the

labor absorption significantly and the other two; rubber production and the size of rubber plantation did not affect labor absorption significantly. Additionally, the probability F-Statistic was 0.000001 which means that all the variables could together affect the labor absorption significantly and the R-Squared showed that all the variables; the number of producer, rubber production, area of production, and provincial minimum wage could affect the labor absorption of around 60.55%. Thus, the rest was affected by the other variables.

1.1.2. Selecting the Appropriate Model

1.1.2.1. Chow Test

Chow test was used to determine the models that the researcher should use; Common Effect Model or Fixed Effect Model. In conducting the test, there were some hypotheses used, they were;

a. H0: when P value > α 5% or the result is not significant, the appropriate model used is Common Effect Model.
b. H1: when P value < α 5% or the result is significant, the appropriate model used is Fixed Effect Model.

Table 4.2 Chow Test Result

Redundant Fixed Effects Tests Equation: Untitled Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	7.097350	(7,28)	0.0001

Cross-section Chi-square	40.816481	7	0.0000

Cross-section fixed effects test equation:
Dependent Variable: LOG(Y)
Method: Panel Least Squares
Date: 01/01/19 Time: 16:37
Sample: 2012 2016
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.036227	4.409814	-1.368817	0.1798
LOG(PRODUCTION)	-0.175788	0.381795	-0.460424	0.6481
LOG(AREA)	0.426070	0.413173	1.031214	0.3095
LOG(UMP)	0.748298	0.348340	2.148184	0.0387
LOG(COMPANY)	0.705953	0.087867	8.034358	0.0000

R-squared	0.737831	Mean dependent var	9.508761
Adjusted R-squared	0.707869	S.D. dependent var	0.791967
S.E. of regression	0.428051	Akaike info criterion	1.257321
Sum squared resid	6.412975	Schwarz criterion	1.468431
Log likelihood	-20.14642	Hannan-Quinn criter.	1.333652
F-statistic	24.62547	Durbin-Watson stat	0.790574
Prob(F-statistic)	0.000000		

Source: Secondary data processed, 2018

Based on the chow test, the probability of Cross Section Chi Square was 0.0000 which means that it was less than 5% and significant. The test showed that the appropriate model that should be used for this research was Fixed Effect Model.

1.1.2.2. Hausman Test

Hausman test was used to determine the appropriate model to use between Fixed Effect Model and Random Effect Model. There were some hypotheses used for this test, they were;

a. H0: when P value > α 5% or the result is not significant, the appropriate model used is Random Effect Model.
b. H1: when P value < α 5% or the result is significant, the appropriate model used is Fixed Effect Model.

Table 4.3 Hausman Test Result

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.787870	4	0.1475

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(PRODUCTION)	-0.239307	-0.188267	0.005581	0.4945
LOG(AREA)	0.357046	0.348688	0.012510	0.9404
LOG(UMP)	0.642018	0.690604	0.009043	0.6094
LOG(COMPANY)	0.465839	0.531845	0.000799	0.0195

Cross-section random effects test equation:

Dependent Variable: LOG(Y)

Method: Panel Least Squares

Date: 01/01/19 Time: 16:37

Sample: 2012 2016

Periods included: 5

Cross-sections included: 8

Total panel (balanced) observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.284323	3.455745	-0.661022	0.5140
LOG(PRODUCTION)	-0.239307	0.301862	-0.792769	0.4346
LOG(AREA)	0.357046	0.346057	1.031754	0.3110
LOG(UMP)	0.642018	0.286109	2.243961	0.0329
LOG(COMPANY)	0.465839	0.079979	5.824545	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.905502	Mean dependent var	9.508761
Adjusted R-squared	0.868378	S.D. dependent var	0.791967
S.E. of regression	0.287323	Akaike info criterion	0.586909
Sum squared resid	2.311534	Schwarz criterion	1.093573
Log likelihood	0.261824	Hannan-Quinn criter.	0.770102
F-statistic	24.39122	Durbin-Watson stat	1.580285
Prob(F-statistic)	0.000000		

Source: Secondary data processed, 2018

Based on the hausman test, the probability was at 0.1475 which means that it was more than 5% and not significant. The hausman test showed that the appropriate

model that should be used in the research was Random Effect Model. Thus, based on both tests; chow test and hausman test, the best model for the research was Random Effect Model.

1.1.2.3. Random Effect Model Regression Result

Table 4.4 Random Effect Model Result

Dependent Variable: LOG(Y)
Method: Panel EGLS (Cross-section random effects)
Date: 01/01/19 Time: 16:36
Sample: 2012 2016
Periods included: 5
Cross-sections included: 8
Total panel (balanced) observations: 40
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.658981	3.331081	-1.098436	0.2795
LOG(PRODUCTION)	-0.188267	0.292472	-0.643709	0.5240
LOG(AREA)	0.348688	0.327484	1.064751	0.2943
LOG(UMP)	0.690604	0.269843	2.559280	0.0150
LOG(COMPANY)	0.531845	0.074817	7.108589	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	0.323480	0.5590
Idiosyncratic random	0.287323	0.4410

Weighted Statistics

R-squared	0.605556	Mean dependent var	3.510333
Adjusted R-squared	0.560477	S.D. dependent var	0.450321
S.E. of regression	0.298547	Sum squared resid	3.119569
F-statistic	13.43314	Durbin-Watson stat	1.226993
Prob(F-statistic)	0.000001		
Unweighted Statistics			
R-squared	0.685318	Mean dependent var	9.508761
Sum squared resid	7.697508	Durbin-Watson stat	0.497264

Source: Secondary Data Processed with E - Views, 2018

Table 4.5 Cross Section Random Effect

PROVINCES	Effect
North Sumatera	0.849124
Riau	0.327208
South Sumatera	0.128158
Lampung	-0.212485
West Kalimantan	-0.005921
Central Kalimantan	-0.851089
South Kalimantan	-0.010174
West Java	0.003707
Aceh	0.346064
East Java	-0.574592

Source: Secondary Data Processed with E – Views, 2018

Based on the random effect regression result, the regression equation model could be expressed as follows:

Log(Y) = -3.658981 – 0.188267*LOG(X1) + 0.348688*LOG(X2) + 0.690604*LOG(X3) + 0.531845*LOG(X4)

Note:

Log(Y) : Labor absorption (Labor)

Log(PRODUCTION) : Rubber Production (Ton)

Log(AREA) : The Size of Rubber Plantation (Ha)

Log(UMP) : Provincial Minimum Wage (Rupiah)

Log(COMPANY) : Number of Company (Unit)

1.1.2.4. Interpretation of the Regression Result

The random effect regression result showed that there two variables that affected labor absorption in rubber plantation significantly, they are; provincial minimum wage and the number of company. Provincial minimum wage showed a probability of 0.0150 with 0.690604 constant which can be interpreted as an increase of 1% provincial minimum wage will increase the labor absorption for 0.69%. Moreover, the number of company showed a same behavior. It has a probability of 0.0000 and 0.531845 constant which means that

an increase of 1% number of company will increase the labor absorption around 0.53%.

In the opposite, the other two variables; rubber production and the size of plantation area did not show a significant effect on labor absorption. Rubber production has a probability of 0.5240 and the constant of -0.188267, while the probability of the size of plantation area is 0.2943 with the constant of 0.348688. Both variables have probabilities that greater than the value of α (5%) so that it can be said that it has no significant effect on Y (labor absorption).

Table 4.5 shows the comparison between all the provinces that were included in the research. Based on the cross section random effect table, North Sumatera had the highest coefficient of 0.849124 which means that among all the ten provinces that categorized as the central of rubber production, North Sumatera happened to be the highest at absorbing labor. Moreover, for the lowest coefficient belongs to Central Kalimantan with the coefficient of -0.851089 which means that the lowest labor absorption among the ten provinces happened to be in Central Kalimantan.

1.1.2.5. Analysis for Every Province

In this research, the writer chose several provinces that were known as the top rubber producers in Indonesia. The provinces that the writer chose were; North Sumatera, Riau, South Sumatera, Lampung, West Kalimantan, Central Kalimantan, South Kalimantan,

West Java, Aceh, and East Java. There were several considerations behind choosing these ten provinces, some of them were the availability of the data, they were considered as the top rubber producers in Indonesia, and some other reasons. Moreover, here was the analysis of each province in this research that was related to the labor absorption.

Table 4.6 The Coefficient Difference between Provinces

PROVINCES	Coefficient C	Coefficient per Province	Provinces' Intercepts
North Sumatera	-3.658981	0.849124	-2.809857
Riau	-3.658981	0.327208	-3.331773
South Sumatera	-3.658981	0.128158	-3.530823
Lampung	-3.658981	-0.212485	-3.871466
West Kalimantan	-3.658981	-0.005921	-3.664902
Central Kalimantan	-3.658981	-0.851089	-4.51007
South Kalimantan	-3.658981	-0.010174	-3.669155
West Java	-3.658981	0.003707	-3.655274
Aceh	-3.658981	0.346064	-3.312917
East Java	-3.658981	-0.574592	-4.233573

Source: Secondary Data Processed With E - Views, 2018

Here were the equations of the result by Fixed Effect estimation for each province in the research:

- North Sumatera

$$\text{Log}(Y) = -3.658981 + 0.849124 - 0.188267*\text{LOG}(X1) + 0.348688*\text{LOG}(X2) + 0.690604*\text{LOG}(X3) + 0.531845*\text{LOG}(X4)$$

$$= -2.809857$$

- Riau

$$\text{Log}(Y) = -3.658981 + 0.327208 - 0.188267*\text{LOG}(X1) + 0.348688*\text{LOG}(X2) + 0.690604*\text{LOG}(X3) + 0.531845*\text{LOG}(X4)$$

$$= -3.331773$$

- South Sumatera

$$\text{Log}(Y) = -3.658981 + 0.128158 - 0.188267*\text{LOG}(X1) + 0.348688*\text{LOG}(X2) + 0.690604*\text{LOG}(X3) + 0.531845*\text{LOG}(X4)$$

$$= -3.530823$$

- Lampung

$$\text{Log}(Y) = -3.658981 - 0.212485 - 0.188267*\text{LOG}(X1) + 0.348688*\text{LOG}(X2) + 0.690604*\text{LOG}(X3) + 0.531845*\text{LOG}(X4)$$

$$= -3.871466$$

- West Kalimantan

Log(Y) = -3.658981 - 0.005921 – 0.188267*LOG(X1) + 0.348688*LOG(X2) +
0.690604*LOG(X3) + 0.531845*LOG(X4)

= -3.664902

- Central Kalimantan

Log(Y) = -3.658981 - 0.851089 – 0.188267*LOG(X1) + 0.348688*LOG(X2) +
0.690604*LOG(X3) + 0.531845*LOG(X4)

= -4.51007

- South Kalimantan

Log(Y) = -3.658981 - 0.010174 – 0.188267*LOG(X1) + 0.348688*LOG(X2) +
0.690604*LOG(X3) + 0.531845*LOG(X4)

= -3.669155

- West Java

Log(Y) = -3.658981 + 0.003707 – 0.188267*LOG(X1) + 0.348688*LOG(X2) +
0.690604*LOG(X3) + 0.531845*LOG(X4)

= -3.655274

- Aceh

Log(Y) = -3.658981 + 0.346064 – 0.188267*LOG(X1) + 0.348688*LOG(X2) +
0.690604*LOG(X3) + 0.531845*LOG(X4)

= -3.312917

- East Java

Log(Y) = -3.658981 - 0.574592 – 0.188267*LOG(X1) + 0.348688*LOG(X2) + 0.690604*LOG(X3) + 0.531845*LOG(X4)

= -4.233573

Based on all the equations above, it could be seen that the province that absorbed labor the most from the labor market and also the one that absorbed labor lesser than the other provinces. The result of the equation showed that North Sumatera absorbed more people on the rubber plantation with the coefficient of -2.809857. It was followed by Aceh with -3.312917, Riau with the coefficient of -3.331773, Riau with 13.87169, South Sumatera with -3.530823, West Kalimantan with -3.664902, West Java with -3.655274, South Kalimantan with -3.669155, Lampung with -3.871466, East Java with -4.233573, and at the end followed by Central Kalimantan with the coefficient of -4.51007. From the result, it showed that Central Kalimantan happened to be the lowest labor absorption among the other provinces in this research. The differences of labor absorption in all of these provinces could be caused by many things, for instance the difference of the number of unemployment in every province, the weather of each province that was suitable for rubber plantation, rubber price fluctuation and the economy situation at the time.

1.2. Hypotheses Test

1.2.1. Determinant Coefficient (R^2)

Determinant coefficient was the coefficient that the writer used in order to measure the changes of the dependent variable in this research. Since the dependent variable was affected by the independent variables, this coefficient was used to measure the changes of the dependent variable that affected by them. According to the regression result in Table 4.3, the determinant coefficient (R^2) was 0.605556 or 60.55%. The value of this coefficient means that there were some changes around 60.55% of the dependent variable in this research (labor absorption) that were affected by the independent variables in this research; X1 (Rubber Production), X2 (The Size of Rubber Plantation), X3 (Provincial Minimum Wage), and X4 (The Number of Company) and the rest (39.45%) could be explained or affected by the other variables.

1.2.2. F – Statistic Test

F – Statistic test was used with the purpose to see the significance of the independent variables that affected the dependent variable. In F – Statistic test, the thing that should be monitored was not only one or two independent variables against dependent variables, but it monitored all the independent variables in the research against the dependent variable. Based on the random effect regression on Table 4.3, the value of f – statistic was 13.43314 with the probability of 0.000001. The probability of f – statistic was less than the value of α (5% or 0.05)

which means that all of the variables in the research; X1 (Rubber Production), X2 (The Size of Rubber Plantation), X3 (Provincial Minimum Wage), and X4 (The Number of Company) together could give significant effect on labor absorption in 10 provinces that the writer chose to be in the research.

1.2.3. T – Statistic Test

T – Statistic result is showed in Table 4.3.

a. T – Statistic test for X1 (The Rubber Production)

The value of t – statistic for PRD was -0.643709 with the probability of 0.5240 in which it was greater than α (5% or 0.05). This result means that statistically the number of producer had no significant effect on labor absorption in rubber industry.

b. T – Statistic Test for X2 (The Size of Rubber Plantation)

The value of t – statistic of variable X2 (the size of rubber plantation) based on the regression result was 1.064751 with the probability of 0.2943. The probability was greater than the value of α (5% or 0.05) which means that based on the statistic of the data, the X2 variable or the size of rubber plantation did not affect labor absorption significantly.

c. T – Statistic Test for X3 (Provincial Minimum Wage)

The value of t – statistic of provincial minimum wage based on the regression result on Table 4.3 was 2.559280 with the probability of 0.0150. The probability was less than the value of α

(5% or 0.05) which means that statistically, the X3 Variable had significant effect on labor absorption in some provinces in Indonesia. The coefficient of this variable stood at 0.690604. It means that when the provincial minimum wage or UMP increased by 1%, it would increase the labor absorption by 0.69%. Thus, provincial minimum wage affected the labor absorption positively in some rubber producer provinces in Indonesia.

d. T – Statistic Test for X4 (The Number of Company)

The value of t – statistic of X4 Variable (The Number of Company) on the regression was 7.108589 with the probability of 0.0000. The probability was less than the value of α (5% or 0.05). It means that the area of production or plantation had significant effect on labor absorption in rubber plantation of some provinces. Moreover, the coefficient of variable X4 was 0.531845 which means that when the area of production or rubber plantation increased by 1%, it could decrease the labor absorption by 0.53%. Based on the statistic and the regression result on Table 4.3, it can be inferred that the number of company had negative effect on labor absorption in the provinces that the writer chose to do the research.

1.3. The Result Analysis and Economics Explanation

1.3.1. The Analysis of the Effect of X1 (Rubber Production)

According to the regression result, X1 variable has no significant effect on Y (labor absorption) because its probability is greater

than the value of α (5%) and both variables have negative relationship. X1 or rubber production had no effect on labor absorption in rubber plantation because it is believed that there are some other factors dominate in the market such as the high price of worker, and in this case is the price of rubber in national and international market. During 2012 – 2016 the price of rubber in the world market is not stable. The price of rubber tends to decrease that happened to affect labor absorption in rubber plantation. in 2011 – 2012 the price of rubber in Indonesia was Rp12.000 and it decreased during 2012 – 2013 to become Rp10.000. When the price of rubber decreased, the company tends to reduce the number of labor and increase the productivity of the labor in order to decrease the budget spent for factor of production. To face this problem, many suggested the government to fix the relationship between industries and the employment condition in order to make the situation conducive. The other problem that should be fixed regarding to this issue were the formulation of wage level and productivity of the people.

1.3.2. Analysis of the Effect of X2 (Size of Rubber Plantation)

The regression result shows that X2 variable (the size of rubber plantation) has no significant effect as well on Y (labor absorption) because its probability is greater than the value of α (5%) and both variables have positive relationship. X1 or the size of plantation area had no significant effect on labor absorption because during the research period (2012 – 2015), the interest of people to work in rubber plantation

decreased since the price of rubber decreased from year to year. It caused the company stopped their land extension and so their labor absorption. Some of them changed their rubber plantation to another kind of plantation such as palm oil. Based on Lukman Zakaria in an article entitled "Produksi Karet ditarget Naik, Petani Nilai tak Realistis" (2015), it is impossible to increase the rubber production since some rubber cultivation have changed to become another cultivation".

1.3.3. Analysis of the Effect of X3 (Provincial Minimum Wage)

The regression result shows that X3 (provincial minimum wage) has a significant effect on Y (labor absorption) because its probability is smaller than the value of α (5%) and both variables have positive relationship.

It can be explained by understanding the producer behavior in microeconomics theory and the economic condition during 2012 – 2015. When the provincial minimum wage increases, it will increase the purchasing power of the people or the consumer. It will lead to a high demand of goods and services which will drive the company or producer to produce more in order to meet the demand. To meet the demand of the market, the company or producer will increase the number of labor to work for them so that they will be able to produce in a high number of goods and services.

1.3.4. Analysis of the Effect of X4 (The Number of Company)

The regression result shows that X4 variable (the number of company) has a significant effect on Y (labor absorption) because its probability is smaller than the value of α (5%) and both variables have positive relationship.

When the number of company increases, then the new company especially will start looking for labor to work for them that is why it will increase the labor absorption. It is supported by the research result of Wicaksono (2010) in Widdyantoro (2013) which stated that the number of company or working unit (the result of a high investment) can increase the labor absorption. Thus, the number of company is one of the most important variables in determining labor absorption in the market.