THE ANALYSIS OF FACTORS THAT AFFECT LABOR ABSORPTION IN NATURAL RUBBER PLANTATION

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ABSTRACT

The study aimed to analyze several indicators that exist in the rubber industry and their influence on labor absorption in particular provinces in Indonesia from 2012-2015. The provinces consisted of North Sumatera, Riau, South Sumatera, Lampung, West Kalimantan, Central Kalimantan, South Kalimantan, West Java, Aceh, and East Java. The factors that the writer used in this research were rubber production, the size of rubber plantation, provincial minimum wage, and the number of company. This research used panel data regression as the analyzing tool and random effect model as the best model to describe the relationship between independent and dependent variables. The result of the result shows that the provincial minimum wage and the number of company had significant effect on labor absorption while the other two, rubber production and the size of rubber plantation area did not have significant effect on labor absorption.

Keywords: rubber, labor absorption, minimum wage, producer, production

ABSTRAK

Penelitian ini bertujuan untuk menganalisis faktor - faktor yang ada di industri karet dan pengaruhnya terhadap penyerapan tenaga kerja di industri tersebut dari tahun 2012 - 2015. Penelitian ini mencakup beberapa provinsi tertentu yaitu Sumatera Utara, Riau, Sumatera Selatan, Lampung, Kalimantan Barat, Kalimantan Tengah, Kalimantan Selatan, Jawa Barat, Aceh, dan Jawa Timur. Beberapa indikator yang digunakan adalah banyaknya produksi karet, luas perkebunan karet, upah minimum provinsi, dan jumlah perusahaan karet. Di dalam penelitian ini, penulis menggunakan regresi data panel sebagai media analisis dengan *random effect model* sebagai model terbaik untuk mendeskripsikan hubungan antara variable dependen dan independen. Hasil dari penelitian menunjukkan bahwa upah minimum provinsi dan jumlah perusahaan karet memiliki dampak yang signifikan terhadap penyerapan tenaga kerja di perkebunan karet sedangkan dua indikator lainnya yaitu banyaknya produksi karet dan area perkebunan tidak memiliki dampak yang signifikan terhadap penyerapan tenaga kerja.

Kata kunci: karet, penyerapan tenaga kerja, upah minimum, perusahaan, produk

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INTRODUCTION

Indonesia is a unique country with the population of 261.1 million people living on its islands. With this huge amount of people on its massive 1.905 million kilo meter squares islands, Indonesia provides many capital resources. These resources consist of natural resources and human resources. Tambunan (2015) stated that with a very strategic geographic, Indonesia is very rich of natural sources that make it possible to maximize the utilization in several sectors, such as; agriculture, forestry, fishery, mining, and energy.

Those sectors can provide many jobs that most of Indonesian need.

With all the abundance of resources in the country, unemployment is still becoming a major problem for Indonesia. The picture of unemployment in Indonesia can be seen through Figure 1.1 that shows the unemployment rate in Indonesia from 2010 to 2015. Based on Byrne, D & Strobl, E (2001), unemployment rate is one of the indicators that are used to measure the condition of labor market and the economy's condition in general
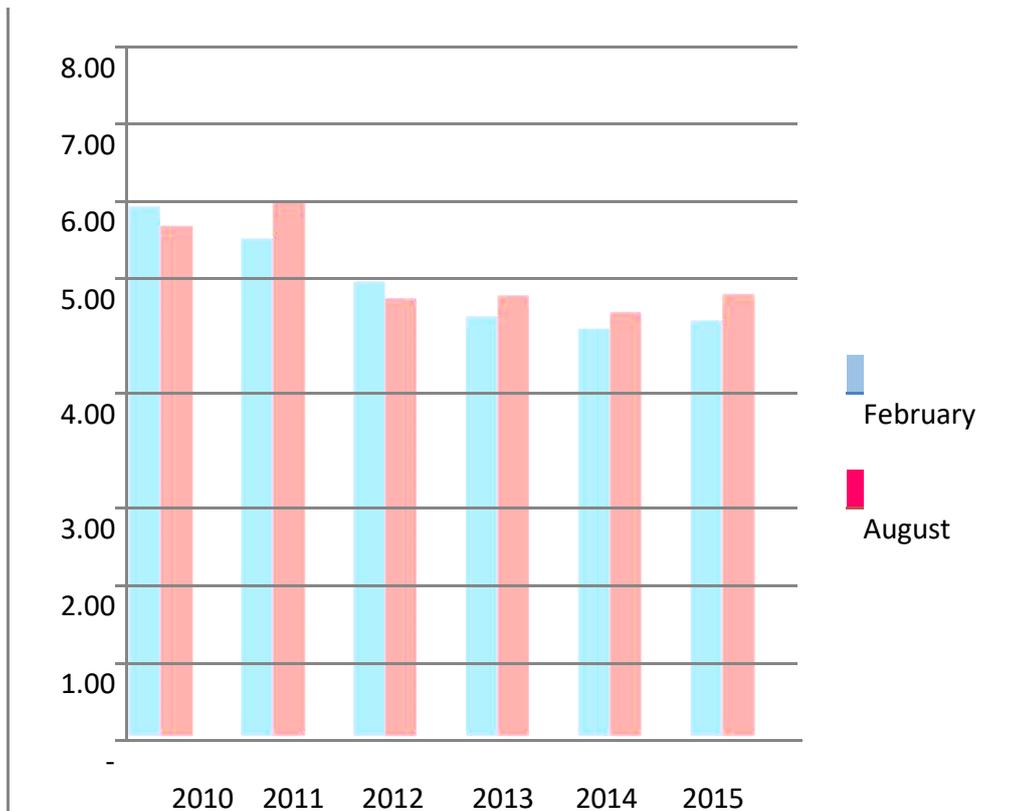
Source: Badan Pusat Statistik (n. d.)

Figure. 1.1 Unemployment Rate in Indonesia

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Based on the figure 1.1 above, the unemployment rate in Indonesia used to fluctuate every year. During 2010 to 2015 with the observation conducted every February and August, the decreasing of unemployment rate only happened in 2010 and 2012. Other than these two years, the rate of unemployment in Indonesia increased but not in a large number. This condition is related to the labor market in many sectors such as agriculture, industry, services, trade, and others. Every sector mentioned has important role in the unemployment rate in the country. One of the most important sectors that has a very strong role in both labor market and economy of the country is the agricultural sector. Vazquez, F., J., A., Lee, J., N., & Newhouse, D (2012) stated that the growth of agriculture has a strong and positive impact on employment growth. They mentioned that when the growth of agriculture increases for 1 percent, it will cause 0.35 percent of additional employment growth. Agricultural sector is very important for Indonesia since it gives several beneficial impacts such as; significant contribution to economic growth, foreign exchange earnings, and food security (Corporate Private Sector Investment in Agriculture in Indonesia, n.d.).

Agricultural sector in Indonesia is very important since this sector produces many things that are important for human wellbeing food. Even though agricultural sector is very close to the production of food, there are many things else that are not food that come from agricultural sector. One of the most massive agricultural products being produced and exported by our country is rubber. Rubber is one of the most important commodities that are mostly used to produce other products. Since it is very important for other production, the demand for this commodity tends to increase together with time. Rubber is really needed for many other productions, for instance tire production. The production of vehicles is always increasing in which will increase the demand for tire and rubber. The demand for rubber at the end will eventually affect the other things related to this commodity starts from the volume of production, the labor absorption, the price of rubber in domestic and international market, and many other things.

Formulation of this research problem is as follow:

a. What is the effect of rubber production on labor absorption?

b. What is the effect of the size of rubber plantation on labor absorption?

c. What is the effect of provincial minimum wage on labor absorption?

d. What is the effect of the number of commpany on labor absorption?

LITERATURE REVIEW

Naibaho (2015) stated that rubber is one of plantation commodities that have important role in the national economy. The demand for rubber products is high due to the widespread use of rubber in which caused the demand for raw materials also increased. Even though the demand of rubber keeps increasing in time, there are still several weaknesses that exist in the rubber producers such as; rubber seedlings, farmers owned capital, rubber garden maintenance, rubber plantation tapping, and farmer groups. However, those weaknesses are followed by some strengths of the rubber plantations in the research area itself that can help the producers meet the demand in the market, they are; climate and land conditions, availability of labor force, farmer's experience, and rubber plantation spacing.

Hauser et. al., (2015) argued that rubber cultivation can result on significant increases in households' income and hence can help those households to move out of poverty. It is supported by Liu et. al. (2006) in which they found that per capita income and expenditure of the people have increased over a period of 15 years due to rubber production in a township of Xishuangbanna, Yunnan. Farmers started to switch from swidden agriculture or shifting agriculture into rubber cultivation that profited the most and in the other case it happened that the ethnic minorities in Southern Yunnan even expanded rubber cultivation into neighboring Laos. Many cases related to the conversion of land into labor plantation happen in Indonesia. This conversion happened due to the increasing of the rubber demand; thus, the government, private companies, and investors try to meet them by converting the land into rubber plantation. When a land is converted into a different plantation, the need for worker will be different where it can be less or more worker needed. Hauser et. al., (2015)

added that almost 90% of respondents perceived that rubber cultivation in their region affect them positively in term of economic situation.

Based on Feriyanto & Sriyana (2016), wage rate is one of the most important variables that can determine the demand of labor and this variable is used by the government to protect the worker in the labor market. Mrnjavac & Blazevic (2014) explained that "A minimum wage is an inferior policy to wage subsidies. If the government is willing to spend the same amount of money directly on wage subsidies that it would otherwise have to spend indirectly to finance the cost of minimum wages through higher expenditures on unemployment and welfare benefits, it could achieve more favorable employment and income effects."

Labor absorption can be affected by many things in the economy, such as; total wage, material of the production, production, and the number of the company (Azhar & Arifin, 2011). In the rubber production, the producers are divided into three main producers, they are the smallholder, state owned company, and the private company. All of them are spread in any province that produces rubber in Indonesia. The number of company may increase when there is an addition in investment and it can decrease when they face bankruptcy. When the number of company or unit increases, the need for worker will increase as well in order to fulfill the companies' demand. It happens because when the number of producer increases, each unit of producer will need people to work for them and produce. This condition affects the supply and demand of the labor in the labor market

Kasman (2009) managed to say that the effort to develop three main commodities (coconut, rubber, and cacao) will certainly increase the role of these commodities in increasing the labor absorption and export revenues. Rubber is very important nowadays since many other industries depend themselves on the rubber production. In "Pengembangan Industri Plastik dan Karet Hilir Prospektif" (n. d.), it is stated that rubber is one of the most important commodities in which will affect the other industries in many ways. Since the use of rubber is very often in many industries such as tire and other parts of plane, the need to increase the number of company and industry related to it is considerable in order to grow the economy of the country.

RESEARCH METHOD

The research used secondary data. Secondary data is the data provided by the second party. The data come from Badan Pusat Statistik (BPS) and Direktorat Jenderal Perkebunan. In this research, the writer used these following data: (1) Data of labor absorption in rubber plantation in 10 provinces from 2012 – 2015; (2) Data of provincial minimum wage of each province from 2012 – 2015; (3) Data of the size of rubber plantation area in 10 provinces from 2012 – 2015; (4) Data of number of rubber company in each province from 2012 – 2015; (5) Data of rubber production from 2012 – 2015. In this research, the writer used panel data regression with e-views 9. Panel data analysis is the combination of cross section data and time series data.

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

$$Log(Y) = \beta_0 + \beta_1*Log(X1) + \beta_2*Log(X2) + \beta_3*Log(X3) + \beta_4*Log(X4)$$

Where, Log(Y) is labor absorption (Labor), Log (Production) is rubber production (Ton), Log (Area) is the Size of rubber plantation (Ha), Log (UMP) is provincial minimum wage (Rupiah), Log (COMPANY) is number of company (Unit).

However, in processing the data, there were three models of approach that the writer used, they were; (1) Common Effect Model (CEM), common effect model is the simplest model in panel data regression because this model will only combine the data of cross section and time series into the pool data. This model assumes that intercept and slope are good between time and place (Sriyana, 2014). (2) Fixed Effect Model (FEM), By only using common effect model, there is a possibility to receive a non-valid result of the data. The result can be said as not valid when it is not the same or near to the actual condition. To face this possibility, there is another model called Fixed Effect Model that makes it possible to create a difference between intercept and slope. (3) Random Effect Model (REM), Random Effect Model is a test that is based on the difference between the intercept and constant that is caused by the error residual.

Moreover, there were two tests that were used in panel data; Chow Test and Hausman Test. (1) Chow Test, Chow

test was conducted to select the appropriate model that should be used as the last estimation between Common Effect Model and Fixed Effect Model. (2) Hausman Test, Hausman test was conducted to determine the appropriate model that should be used as the last estimation between Fixed Effect Model and Random Effect Model.

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 commpany. This research sought the effect of those variables on the labor absorption in each province in particular period of time.

RESULT AND DISCUSSION

This research was conducted in order to find out and analyze the factors

The estimation result of these 3 models (Common Effect, Fixed Effect, and Random Effect) can be seen as follows:

Table 1. Estimation Result Common Effect, Fixed Effect, and Random

Independent	Common Effect Model		Fixed Effect Model		Random Effect Model	
	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
Constant	-6.036.227	0.1798	-2.284.323	0.5140	-3.658.981	0.2795
Production	-0.175788	0.6481	-0.239307	0.4346	-0.188267	0.5240
Area	0.426070	0.3095	0.357046	0.3110	0.348688	0.2943
Minimum Wage	0.748298	0.0387	0.642018	0.0329	0.690604	0.0150
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

Tabel 2. Chow Test

Effect Test	Statistic	d.f	Prob.
Cross-section F	25.107.949	7,28	0.0000
Cross-section Chi-square	79.388.678	7	0.0000

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.

Tabel 3. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. D.f	Prob*
Cross-section random	29.608.946	4	0.0000

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 appropriate model that fit the research was Random Effect Model.

Tabel 4. Random Effect Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.658.981	3.331.081	-1.098.436	0.2795
Production	-0.188267	0.292472	-0.643709	0.5240
Area	0.348688	0.327484	1.064.751	0.2943
Minimum wage	0.690604	0.269843	2.559.280	0.0150
Company	0.531845	0.074817	7.108.589	0.0000

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

random			

Weighted Statistics			
R-squared	0.605556	Mean dependent var	3.510.333
Adjusted R-squared	0.560477	S.D. dependent var	0.450321
S.E. of regression	0.298547	Sum squared resid	3.119.569
F-statistic	1.343.314	Durbin-Watson stat	1.226.993
Prob(F-statistic)	0.000001		

Unweighted Statistics			
R-squared	0.685318	Mean dependent var	9.508.761
Sum squared resid	7.697.508	Durbin-Watson stat	0.497264

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).

Based on the regression result, 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. Moreover, 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.

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. 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.

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. It is supported by the research result of 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.

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 5 The Coefficient Difference between Provinces

Province	Coefficient C	Coefficient per Province	Provinces' Intercepts
North Sumatera	-3.658.981	0.849124	-2.809.857
Riau	-3.658.981	0.327208	-3.331.773
South Sumatera	-3.658.981	0.128158	-3.530.823
Lampung	-3.658.981	-0.212485	-3.871.466
West Kalimantan	-3.658.981	-0.005921	-3.664.902
Central Kalimantan	-3.658.981	-0.851089	-451.007
South Kalimantan	-3.658.981	-0.010174	-3.669.155
West Java	-3.658.981	0.003707	-3.655.274
Aceh	-3.658.981	0.346064	-3.312.917
East Java	-3.658.981	-0.574592	-4.233.573

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.

CONCLUSION

Based on the result of the regression that the writer had done related to the effect of four indicators in the industry of rubber; the number of producers, rubber production each province, provincial minimum wage, and area of plantation on the labor absorption, it can be summarized up as follows:

1. This research used panel data regression in order to get the correct information related to the behavior of the variables included in this research. The best model used in this research was random effect model. Based on this model, the determinant coefficient (R^2) showed that there were changes in labor absorption around 60.55% which would be explained by the independent variables; rubber production, the size of rubber plantation, provincial minimum wage, and the number of company. Moreover, for the f – statistic test, the result showed the probability of 0.000001 in which this was less than the value of α (5% or 0.05). This result means that all of the independent variables in this research; rubber production, the size of rubber plantation, provincial

minimum wage, and the number of company had significant effect on labor absorption.

2. According to Table 4.3 that showed the random effect regression result, rubber production had no significant effect on labor absorption in all ten provinces of this research; North Sumatera, Riau, South Sumatera, Lampung, West Kalimantan, Central Kalimantan, South Kalimantan, West Java, Aceh, and East Java. The coefficient for rubber production was -0.188267 which means when the number of producers or companies increased by 1%, it would decrease the labor absorption by 0.18%.

3. The size of rubber plantation had no significant effect on labor absorption in the research provinces (the probability is 0.2943, it is greater than the value of $\alpha = 5\%$). The coefficient of this variable was 0.348688 which means when the size of rubber plantation increased by 1%, it would increase the labor absorption by 0.34%.

4. The provincial minimum wage had significant effect on labor absorption in the research provinces (the probability is 0.0150, it is less than the value of $\alpha = 5\%$). The coefficient of

this variable was 0.690604 which means when the provincial minimum wage increased for 1%, the labor absorption would increase around 0.69%.

5. The number of company had significant effect on labor absorption (the probability is 0.0000, it is less than the value of $\alpha = 5\%$). Based on Table 4.3, the coefficient of this variable was 0.531845 where it referred to the increasing of the number of company for 1% would cause 0.53% increase of labor absorption.

Based on the analysis and conclusion above, the writer can present several recommendations that can be considered by related parties, they are:

1. Labor absorption can be affected significantly by many indicators in the rubber industry for instance the provincial minimum wage and the number of rubber company in each province. Moreover, all of the changes that they made are based on the situation in the industry itself such as the environment of employment or labor market. A healthy labor market will lead to a decrease of labor absorption especially in the rubber industry. It

is suggested that the government can create a healthy labor market in which they offer skillful yet competitive worker inside of it, so it will not only good for the supply and demand of labor market but also for the producers' productivity in the industry.

2. The government needs to give more attention to the people who work in the labor industry since the price of rubber is not always stable all the time. When the price gets low for instance, it will be a motivation for the companies to cut off their worker because they will spend more than they receive in the industry. If the company starts to cut off people who work for them, then the number of unemployment will increase and it will not be good for the country's economy.

3. Since rubber industry involves many farmers, it will be a positive thing for the government to give more attention to their welfare since the price of the rubber will affect so much on them. The government may give more subsidies for them or keep

circulating their supply when the supply of labor is low.

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