Factor-Factor Affecting Labor Demand Food Beverages and Tobacco Industry of North Sumatra Province

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- Keywords: Labor Demand Food Beverages and Tobacco Industry, Investment Industry Sector, Number of Large and Medium Manufacturing, Minimum Wage of Regency/City, Gross Regional and Domestic Product
- Abstract: Labor demand in North Sumatra during the period 2012 to 2016 showed a fluctuating condition. The aim of this research is to analyze the factors that affecting labor demand food beverages and tobacco industry at the regency/city in North Sumatra Province using panel data. With independent variables Investment Industry Sector, Industry Number, Minimum Wage for regency/city and Gross Regional Domestic Product while the dependent variable is Labor Demand. Data obtained the Central Statistics Agency (BPS) of North Sumatra Province during 2012-2016. The method used Panel Least Square (PLS) with Random Effect Model (REM). The result show that Investment Industry Sector has positively effect the labor demand as 21,88% and significant, Industry Number has positively effect the Labor Demand as 48,48% and significant, Minimum Wage of regency/city has negatively effect the Labor Demand as 34,51% and significant at the Labor Demand in North Sumatra Province.

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1 INTRODUCTION

Improving community welfare is one of the main goals of economic development in developing countries. One of the important problems faced by developing countries is high population growth. The high population growth affects the increase in the workforce. This condition will be a problem if it is not balanced with employment. One indicator used to assess the success of a country's economic development is seen from the employment opportunities created by economic development activities (Freter, 2014). One sector that plays an important role in economic development is the industrial sector. This sector has several advantages, such as absorbing a large workforce and creating high added value. The industrial sector is believed to be a sector that can lead other sectors in an economy towards progress

In Indonesia, the industrial sector is prepared to be able to become a leading sector that is able to become a motor that drives the progress of other sectors. Thus the industrial sector is expected to be able to provide employment so that it can absorb the large number of workers in Indonesia. In the Province of North Sumatra from 2014-2016 the contribution of the manufacturing industry to the GRDP of North Sumatra Province each year has increased. Where each year the contribution of the Processing Industry to North Sumatra GRDP always increases in 2015 by 0.13 percent from 2014 and in 2016 by 0.28 percent. While the lowest contribution is from the water supply sector, recycling waste management where in 2015 only increased by 0.01 percent from 2014 and in 2016 did not experience an increase from the previous year.

In the Province of North Sumatra the Processing Industry is divided into 9 groups namely (1) Food, beverages and tobacco industries; (2) Manufacture of textiles, apparel and leather; (3) Timber industry, household; (4) Paper industry, printing and publishing; (5) Chemical, coal, rubber and plastic

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industries; (6) Industries of non-metallic minerals except oil and coal; (7) Base metal industry; (8) Manufacture of metal goods, machinery and equipment; (9) Other processing industries. (BPS North Sumatra, 2017). Of the 9 industrial groups, the growth of the number of industries each year from 2013-2016 fluctuated, the highest growth was achieved by the food, beverage and tobacco industries. The role of growth in the 9 industrial groups will have an impact on the number of workers used.

Absorption of labor in 9 industrial groups each year fluctuates. The highest absorption of labor is in the food, beverage and tobacco industry sectors where the number of workers employed in 2016 is 89,782 people. While the lowest was in other processing industries, which amounted to 2,655 people. So that it can be concluded that the role of the food, beverage and tobacco industry sector is able to spur regional economic growth and the development of the industrial sector in North Sumatra Province. The growth and development of the industrial sector promises to broaden employment opportunities. On the other hand, the government wants to optimize the role of the food, beverage and tobacco industries in North Sumatra province in contributing to the demand for labor so that there needs to be an in-depth study of the factors that affect labor demand in the food, beverage and tobacco industries.

According to Simanjuntak (1985) and Hani Handoko (1985), Demand for labor in the small industrial sector is influenced by internal and external factors of each of its business units. Internally influenced by output values, wage rates, labor productivity, capital (technology), and other non-wage expenditures. While externally is influenced by the level of economic growth, inflation, unemployment and interest rates. Based on the research of Afrida (2003) that the high and low absorption of labor by the economic sector depends on several factors such as output value, wage level, education level (labor quality), working capital and the number of industries. In line with the results of the study of Esti R (2003) that the factors that influence labor demand are industrial output, working capital (investment), wage level and the number of industries used by the sector. Based on the results of previous research the author tried to examine the factors that influence labor demand, namely: industrial investment, number of industries, wage level and GRDP.

2 THEORICAL FRAMEWORK

2.1 Effects of Investment Industrial Sector on Labor Demand

In Keynes's macro theory, to decide whether an investment will be carried out or not depends on the comparison between the amount of expected profit (expressed in percentage per unit time) on the one hand and the cost of using funds / interest rates on the other. This expected level of profit is called the Marginal Efficiency of Capital / MEC (Boediono, 1986). In summary this concept can be described, if the expected profit (MEC) is greater than the interest rate, then the investment is carried out. If the MEC is smaller than the interest rate, then the investment may be carried out and may not be in accordance with the decision of the owner of the capital.

From the description above it is known that the level of investment desired by investors is determined by two things, namely the interest rate that applies the MEC or investment function. This MEC function / investment function shows the relationship between the prevailing interest rate and the level of investment expenditure desired by investors.

Through the investment function curve there are three things that need to be underlined about this investment function, that is, first, the function has a negative slope which means that the lower the interest rate, the greater the investment expenditure desired or planned by investors.

Second, in reality this investment function is difficult to obtain because its position is very labile and easily changed in a short period of time. The volatility of the investment function can be understood, because its position is very dependent on the MEC values of the existing projects and that the MEC is the profit expected by investors. Because it is based on future expectations / expectations (if on the basis of subjective calculations) where the MEC of a project may change from day to day and sensitive to changes in the socio-economic conditions of a country. The existence of political turmoil in an area, rumors of a devaluation, the issue of foreign exchange control, and restrictions on imports for example will directly be able to change the subjective judgment of investors in a project. So many factors influence the MEC, so the position of investment functions will be very easy to change. The volatility of the investment function is a theoretical and Keynesian explanation of the fact that in reality investment expenditure (I) shows

unpredictable up and down fluctuations over time. This instability is a characteristic that distinguishes investment from other aggregate demand elements (C, G).

Third, what needs to be emphasized is the relationship between Keynes's investment theory and reality, especially regarding the issue of the availability of investment funds. Keynesian theory is based on the assumption that at the prevailing interest rate, every investor can get any funds to finance projects that are considered profitable to implement. What limits the amount you want to invest is only an assessment of MEC projects that are open to him. In reality the opposite is often the case with so many profitable projects, MEC rises but it is difficult to obtain credit from banks for example, resulting in realized investments being smaller than the desired level of investment (Boediono, 1986).

2.2 Effect of the Number of Large and Medium Regency/City on Labor Demand

A company or industrial business is a unit (unit) of a business that carries out economic activities, aimed at producing goods or services. Squire in Kemala (2006) argues that in general, the growth of business units in a production sector in an area will increase the number of workers.

Matz (1990) said, to determine the size of adding or reducing the amount of labor carried out by employers, then:

- Employers will need a certain amount of money to be obtained with the additional company, as well as labor. If the number of outputs produced by a larger number of companies will produce a large output as well, so the more number of companies that stand, the more likely there will be an increase in production output.
- 2) The output value of a region estimates that production will increase with the increase in the number of companies producing the same goods. By increasing the number of companies, it is expected to increase the number of production, so that the increase in the number of workers will also increase because labor is needed in the production process. Lestari (2011) argues that the more the number of companies or business units that stand, the more there will be an increase in labor force, meaning that if a business unit of an industry is added, then the demand for labor will also increase.

2.3 Effect of Minimum Wages of Regency/City on Labor Demand

Wages are an income as a reward from employers to workers or workers for a job or service that has been or has been done. Simanjuntak, (2001) says that wages for employers can be seen as a burden because the greater the wages paid to employees, the smaller the proportion of profits for employers.

According to Kuncoro, 2002 (in Fitria, 2014), the quantity of labor demanded will decrease as a result of wage increases. If the wage level rises while the prices of other inputs remain, then the price of labor is relatively more expensive than other inputs. This situation encourages employers to reduce the use of labor that is relatively expensive with other inputs whose relative prices are cheaper in order to maintain maximum profits. Siringo-ringo (2012), Providing wages is a reward / remuneration from the company to its workers for the achievements and services contributed in production activities. The Effect of Minimum Wages on Labor Demand

Wages are an income as a reward from employers to workers or workers for a job or service that has been or has been done. Simanjuntak, (2001) says that wages for employers can be seen as a burden because the greater the wages paid to employees, the smaller the proportion of profits for employers.

2.4 Effect of GRDP on Labor Demand

The increase in GRDP is one of the most important indicators in assessing the performance of an economy, especially to carry out an analysis of the results of economic development that has been carried out by a country or region. The increase in GRDP will drive other sectors so that from the production side it will require a production workforce. A general view states that increasing GRDP is positively correlated with labor. Todaro (2000) says that population growth and labor force growth (which occurs after population growth) are traditionally considered as one of the positive factors that spur economic growth (GRDP). A larger number of labor means that it will increase the number of productive labor, while greater population growth means increasing the size of its domestic market.

3 RESEARCH METHOD

This study uses secondary data with time series data types during the period 2014-2016. With the data used sourced from the Central Statistics Agency. The data required include the number of industrial sector investments in rupiah units, the number of food, beverage and tobacco industries in company units, district / city minimum wages in rupiah units, and the GRDP of constant prices in rupiah units in North Sumatra Province.

The data analysis method used in this study is quantitative with a panel data analysis model or pooled data. Panel data is a combination of time series data and time data (cross section). To overcome the intercorrelations between the independent variables which ultimately can lead to the inappropriate regression estimation, the panel data method is more appropriate to use. The data used in this study are in the form of time series data from 2014 to 2016 and a cross section consisting of 25 districts and 8 cities in North Sumatra Province. The function model of the equation in this study are:

JTKMMT =
$$\beta_0 + \beta_1 INVSI_{it} + \beta_2 NLMM_{it} + \beta_3 MWRC_{it} + \beta_4 GRDP + \varepsilon_{it} ...(3.1)$$

4 ANALYSIS

4.1 Selection of models in data processing

In panel data processing, it is necessary to select the most appropriate model between Common Effect estimation models, Fixed Effect estimation models and Random Effect estimation models. To choose between the three estimation models there are several tests that can be done, including:

4.1.1 Chow Test (F-statistical test)

This test is used to determine the most appropriate model to be used between the Common Effect estimation model or the Fixed Effect estimation model, with the hypothesis:

- H0: choose to use the CommonEffect estimation model.
- H1: choose to use the fixed effect estimation model.

This hypothesis test can be done by comparing F-statistics with F-tables. If F-statistics > F-table then H0 is rejected which means the most appropriate model to use is the Fixed Effect Model and can also be done by considering the probability value (Prob.) For F-statistics. If the value of the Prob. F-statistic < 0.05 (determined at the beginning as the level of significance or alpha) then the chosen

model is Fixed Effect Model, but if > 0.05 then the chosen model is the Common Effect Model.

Table 1 Chow Test Results Redundant Fixed Effects Tests Equation: FEM Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
		(32,62	
Cross-section F	9.508492)	0.0000
	175.8478		
Cross-sectionChi-squa	re72	32	0.0000
•			

From Table 1, the F-statistic value is 9.508492 with the F-table value in df (32.62) $\alpha = 5\%$ is 1.51520 so that the F-statistic value > F-table with a probability of 0.0000 (< 0.05), so H1 statistics are accepted and reject H0, according to the results of this estimation the right model used is the estimation model Fixed Effect Model.

4.1.2 Hausman Test

This Hausman test is used to select the model that will be used between the Fixed Effect estimation model or the Random Effect estimation model, with the following hypothesis test:

- H0: choose to use the Random Effect estimation model.
 - H1: choose to use the FixedEffect

estimation model. The Hausman test can be done by comparing Chi-Square statistics with Chi-Square tables. If Chi-Square statistics > Chi-Square table then H0 is rejected which means the most appropriate model to use is the Fixed Effect Model and can also be done by considering the probability value (Prob.) For Chi-Square statistics. If the value of the Prob. Chi-Square statistic < 0.05 (determined at the beginning as a significance level or alpha), the chosen model is Fixed Effect Model, but if > 0.05 then the selected model is Random Effect Model.

Table 2: Hausman Test Results

Correlated Random Effects - Hausman Test				
Equation: REM				
Test cross-section random effects				
	Chi-Sq.	Chi-Sq.		
Test Summary	Statistic	d.f.	Prob.	
Cross-section			0.	
random	9.157344	4	0673	

From Table 2 the statistical Chi-Square value is 9.157344 with the Chi-Square table at df (4) $\alpha = 5\%$ is 7.815 so the Chi-Square value is statistical > Chi-Square table with a probability of 0.0673 (> 0.05) then H0 is accepted and H1 is rejected so the panel data model used is the Random Effect Model.

From the results of the Chow Test and Hausman Test different results were obtained then continued with the Lagrange Multiplier Test.

4.1.3 Lagrange Multiplier Test

The Lagrange Multiplier Test is used to select the model that will be used between the Random Effect estimation model or the Common Effect estimation model, with the following hypothesis test:

- H0: choose to use the Common Effect estimation model.
- H1: choose to use the Random Effect estimation model.

If the LM value is greater than the critical value of Chi-Squares then H0 is rejected which means that the right model for panel data regression is Random Effect Model and vice versa, if the LM value is smaller than the critical Chi-Squares value then the null hypothesis is accepted which means the model the right for panel data regression is the Common Effect Model.

Table 3: Lagrange Multiplier Test Results						
Lagrange Multiplier Tests for Random Effects						
Null hypotheses						
Alternative hypotheses: Two-sided (Breusch						
Pagan) and one-sided						
(all others) alternatives						
	Test Hypothesis					
	Cross-					
	section	Time	Both			
		0.41381				
Breusch-Pagan	47.26726	4	47.68107			
	(0.0004)	(0.5200)	(0.0000)			

In Table 3 it can be seen that the value of the Prob. Breusch-Pagan cross-section is 0.0004 (< 0.05) so that H1 is statistically accepted and H0 is rejected. Then the model used is the estimation model of Random Effect.

4.2 Hypotesis Result

4.2.1 T-Test (Partial Test)

T-Test aims to determine the effect of the independent variables of industrial sector investment, number of industries, regency / city minimum wages and GRDP in North Sumatra Province.

Table 4: T-Statistical Result

		Std.	t-	
Varia	Coefficient	Error	Statistic	Prob.
С	0.8850	1.2648	0.6997	0.4858
INVSI	0.1811	0.0831	2.1882	0.0311
NLMM	0.7235	0.1493	4.8485	0.0000
MWRC	-0.2470	0.1879	-1.3148	0.0191
GRDP	0.6282	0.1820	3.4513	0.0008

Table 4. is the result of testing the independent variables, Investment Industry Sector, Number of Large and Medium Manufacturing, Minimum Wage of Regency/City, Gross Regional and Domestic Product partially towards the demand labor in North Sumatra Province in 2014 - 2016. This study uses $\alpha = 5\%$ or $\alpha = 0.05$.

If written in an equation, the result is:

From these equations can be concluded as follows:

- 1. Constants of 0.885050 which means that if the Investment variable, the number of industries, MSEs and GRDP is zero, meaning that there is no increase or decrease then the amount of labor demand in North Sumatra Province is 0.885050.
- 2. Investment Variables have a t-statistic of 2.188233 and probability shows a value of 0.0311 which is smaller than the confidence level $\alpha = 5\%$ (0.0311 < 0.05) then this can prove that the investment variable in the industrial sector has a significant effect on the demand of North Sumatra Province workers means H1 is accepted and H0 is rejected. The investment variable coefficient is 0.181931, which means that every increase in investment by 1 percent will increase labor demand by 0.181931 percent with the assumption that number of large and medium manufacturing, minimum wage of regency/city and GRDP is considered to be zero, meaning there is no increase or decrease. This is in line with the opinion of Sukirno (2000) which states that investment or investment can develop businesses or add business units, with business development will require a lot of labor. Thus the addition of capital can reduce the problem of unemployment. Also in line with the results of Erviyanti's (2013) study that increasing investment will also increase the amount of employment.
 - 3. Variable number of large and medium manufacturing has a t-statistic of 4.848522 and probability shows a value of 0.000 which is smaller than the level of confidence $\alpha = 5\%$

(0.000 < 0.05) so this can prove that the variable number of large and medium manufacturing has a significant effect on the demand for Sumatra Province labor North which means H1 is accepted and H0 is rejected. The number of large and medium manufacturing coefficients is 0.724130, which means that each increase in the number of industries by 1 percent will increase labor demand by 0.724130 percent with the assumption that the investment variable, minimum wage of regency/city and GRDP are considered to be zero, meaning there is no increase or decrease.

Minimum wage of regency/city variable has a tstatistic of -1.314806 and probability shows a value of 0.0191 which is smaller than the confidence level $\alpha = 5\%$ (0.0191 < 0.05) so this can prove that Minimum wage of regency/city variables have a significant effect on the demand for labor in North Sumatra Province which means H1 is accepted and H0 is rejected. The Minimum wage of regency/city variable coefficient is -0.247051, which means that every increase in Minimum wage of regency/city of 1 percent will reduce labor demand by -0.247051 percent assuming the investment industry sector variable, number of large and medium manufacturing and GRDP are considered to be zero, meaning there is no increase or decrease. This is in line with the opinion of Kuncoro (2001) that the quantity of labor demanded will decrease as a result of rising wages. It is also in line with Ehrenberg's (1998) research stating that if there is an increase in the average wage level, it will be followed by a decrease in the number of workers requested.

4. GRDP variable has a t-statistic of 3.451348 and probability shows a value of 0.0008 which is smaller than the level of confidence $\alpha = 5\%$ (0.0008 < 0.05) then this can prove that the GRDP variable has a significant effect on the demand of North Sumatra Province workers means H1 is accepted and H0 is rejected. The GRDP variable coefficient is 0.628250, which means that every increase in GRDP of 1 percent will increase labor demand by 0.628250 percent with the assumption that the investment industry sector variable, number of large and medium manufacturing and minimum wage of regency/city is considered to be zero, meaning that there is no increase or decrease. This is in line with the opinion of Todaro (2000) which states that population growth and labor force growth are traditionally considered as one of the positive factors that spur economic growth (GRDP).

4.2.2 F-Statistics Test

To test whether the independent variable has a simultaneous effect on the dependent variable, the F-test is used by looking at probability and F-statistics. The hypothesis is as follows:

- H1: Investment industry sector, number of large and medium manufacturing, Minimum wage of regency/city, and GRDP together have a significant effect on the demand labor in the North Sumatra Province for the period 2014-2016.
- H0: Investment industry sector, number of large and medium manufacturing, Minimum wage of regency/city, and GRDP does not affect the demand for labor in the Province of North Sumatra for the period 2014-2016.

The F-statistic Result value is 64,887 with a probability of 0.0000 which means it is smaller than $\alpha = 5\%$. The probability value of F-Statistics is smaller than $\alpha = 5\%$, then H1 is accepted and H0 is rejected so it can be concluded that together the : Investment industry sector, number of large and medium manufacturing, Minimum wage of regency/city, and GRDP have a significant effect of 64,887 on the demand for provincial labor North Sumatra 2014-2016 period.

4.2.3 Determination Coefficient Test Results (R2) According to Gujarati and Porter (2012), the coefficient of determination (R2) is used to measure the goodness of fit of a regression line. This value shows how much influence the independent variables together can provide an explanation of the dependent variable, where the coefficient of determination (R2) is between 0 to 1 ($0 \le R2 \le 1$). The smaller R2 approaches 0, meaning that the smaller the influence of the independent variable on the dependent variable. Conversely, if R2 approaches 1, it indicates the stronger influence of independent variables on the dependent variables.

Based on the results of the panel data analysis of R Square the determination coefficient is 0.734. This means that 73 percent of the demand labor in 33 (thirty three) regencies / cities in the Province of North Sumatra in the 2014-2016 period can be explained by Investment industry sector, number of large and medium manufacturing, Minimum wage of regency/city, and GRDP. While the remaining 27 percent is explained by other variables not examined in this study.

5 **RESULTS**

Based on the results of the analysis that has been carried out regarding the factors that affect the demand for labor in the food, beverage and tobacco industries in the Sumatran province, the following conclusions are obtained:

- a. Investment Industry Sector has a positive and significant effect on the demand labor in North Sumatra Province. This means that the increase in investment in the industrial sector causes demand for labor in the food, beverage and tobacco industries to also increase.
- b. The number of large and medium manufacturing has a positive and significant effect on the demand labor in North Sumatra Province. This means that the increasing number of industries causes the demand labor food, beverage and tobacco industries to also increase.
- c. Minimum Wages of regencycity have an effect on negatively influencing the demand for labor in North Sumatra Province. This means that the increase in minimum wages causes the labor demand food, beverage and tobacco industries to decline and vice versa.
- d. GRDP has a positive and significant effect on the demand labor in North Sumatra Province. This means that increasing GRDP causes the demand labor food, beverage and tobacco industries will also increase.

6 CONCLUSIONS

Based on the results of the testing and the following discussion some suggestions were made regarding the results of the study:

- a. Private investment as a source of development funding needs to be increased by increasing the provision of facilities to encourage private investment. The facilities in question are: clear regional regulations on investment, ease of investment, providing clear and accurate information about investment opportunities, making maps of regional potential, establishing integrated service units in the regions to facilitate the service of making business licenses and no less important conducive climate for private investment such as security.
- b. District / city governments in North Sumatra Province are expected to continue to increase minimum wage of regency/city so that the community can meet their needs.
- c. In addition to investment, the number of large and medium manufacturing, minimum wage of regency/city and GRDP there are other factors

related to labor demand such as credit interest rates, real GRDP, industrial output values and others that might be used as additional variables for further research.

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