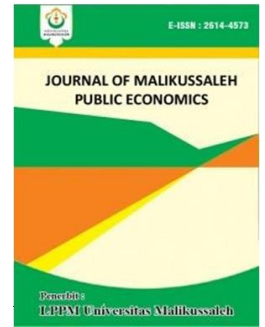


FACTORS AFFECTING THE DEMAND OF LABOR IN THE 10 REGENCIES/CITIES OF THE SUMATERA UTARA PROVINCE



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ARTICLE INFORMATION ABSTRACT

Keywords:

output, number of companies, economic growth, labor demand, panel data regression.

This study aims to determine the factors that affect the demand for labor in Sumatera Utara Province. This study discusses panel data analysis using data on labor demand, output, number of companies, and economic growth in Sumatera Utara Province from 2013-2019. The regression data panel can be estimated using three models, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). To get the best model, two tests were used, namely the Chow test and the Hausman test. In this study, the best model is obtained is the Fixed Effect Model. Estimation of parameters in panel data regression with Fixed Effect Model obtained a mathematical equation, namely $LD_{it} = 3940.726 + 1.60.10-10O_{it} + 67.06560JP_{it} + 146.0139G_{it} + eit$. Based on the significance test, the demand for labor is simultaneously influenced by output, the number of firms and economic growth. When viewed by a partial test (t test), the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the economic growth variable has a positive but insignificant effect on labor demand. Estimation of parameters in panel data regression with Fixed Effect Model obtained a mathematical equation, namely $LD_{it} = 3940.726 + 1.60.10-10O_{it} + 67.06560JP_{it} + 146.0139G_{it} + eit$. Based on the significance test, the demand for labor is simultaneously influenced by output, the number of firms and economic growth. When viewed by a partial test (t test), the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the economic growth variable has a positive but insignificant effect on labor demand. Estimation of parameters in panel data regression with Fixed Effect Model obtained a mathematical equation, namely $LD_{it} = 3940.726 + 1.60.10-10O_{it} + 67.06560JP_{it} + 146.0139G_{it} + eit$. Based on the significance test, the demand for labor is simultaneously influenced by output, the number of firms and economic growth. When viewed by a partial test (t test), the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the economic growth variable has a positive but insignificant effect on labor demand. the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the economic growth variable has a positive but insignificant effect on labor demand. the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the economic growth variable has a positive but insignificant effect on labor demand.

1. PRELIMINARY

Economic development of a region or country is basically an interaction of various groups including human resources, natural resources, capital, technology and others. Therefore, economic development cannot be separated from the role of humans in managing it. Where humans are workers, development inputs, are also consumers of the results of development itself (Asryad, 1999 in Tindaon, 2010).

Labor is one of the most important production factors in supporting economic growth in addition to land, capital and management/skills production factors. Given the importance of these factors, the potential of the workforce should be utilized properly (Soekartawi, 1990).

Table 1.

Gross Regional Domestic Product at Constant Prices for Sumatera Utara Province 2016-2019

GRDP Category	2016	2017	2018	2019
A. AGRICULTURE, FORESTRY AND FISHERIES	115,179.69	121,300.04	127,202.65	133,726.02
B. MINING AND QUICKING	6,144.99	6,440.54	6,792.01	7,099.76
C. PROCESSING INDUSTRY	90,680.99	92,777.25	96,174.60	97,362.10
D. ELECTRICITY AND GAS PROCUREMENT	622.76	677.08	694.58	728.79
E. WATER PROCUREMENT, WASTE MANAGEMENT, WASTE AND RECYCLING	446.05	475.82	489.61	516.23
F. CONSTRUCTION	57,286.44	61,175.99	64,507.11	69,212.03
G. WHOLESALE AND RETAIL TRADE; CAR AND MOTORCYCLE REPAIR	80,702.74	85,436.75	90,652.80	96,936.19
H. TRANSPORTATION AND WAREHOUSE	21,390.03	22,961.90	24,372.51	25,786.50

I. PROVISION OF ACCOMMODATION AND DRINKING	10,512.20	11,282.16	12,131.74	13,209.12
J. INFORMATION AND COMMUNICATION	11,913.13	12,933.95	14,024.32	15,375.56
K. FINANCIAL SERVICES AND INSURANCE	14,531.04	14,601.55	14,854.35	15,138.89
L. REAL ESTATE	19,187.89	20,637.93	21,740.03	22,792.55
M. COMPANY SERVICES	4,065.41	4,368.69	4,678.85	4,953.49
O. GOVERNMENT ADMINISTRATION, DEFENSE AND SOCIAL SECURITY MANDATORY	15,083.58	15,463.27	16,409.76	17,746.92
P. EDUCATIONAL SERVICES	9,341.37	9,802.14	10,418.75	10,924.95
Q. HEALTH SERVICES AND SOCIAL ACTIVITIES	4,366.28	4,699.93	4,977.05	5,207.26
R, S, T, U. OTHER SERVICES	2,320.88	2,496.24	2,644.92	2,810.24
GROSS REGIONAL DOMESTIC PRODUCT	463.775.46	487.531.23	512.765.63	539,526.60
GROSS REGIONAL DOMESTIC PRODUCTS WITHOUT OIL AND GAS	463,151.36	486,937.60	512,203.85	538,978.04

Source: BPS Sumatera Utara Province (2020)

According to the Central Bureau of Statistics (2020), one sector that plays an important role in economic development is the manufacturing sector. This sector contributes greatly in contributing to the Gross Regional Domestic Product (GRDP) of Sumatera Utara Province from year to year (yoy).

According to Tambunan (2006), there are three main reasons the industrial sector is used as a key sector for economic development and growth. First, industry is the only economic sector that can generate the most added value and is the largest contributor to growth. Second, industry can act as a puller or pusher for the development and growth of output in other economic sectors. Third, industry is the most important sector for technology development which can then be spread through spillover effects to other sectors. This has been proven by the countries that experienced the industrial revolution tended to increase their economic growth rapidly.

Table 2.

Data on Labor, Output, Number of Companies, and Economic Growth by Regencies/Cities 2013-2019

N	Regencies/ o	Cities	Y	Req	Output	amo	Gro
			ea	uest		unt	wth
			r	Lab		Com	Eco
			or	or		pany	nom
							y
1	Medan	20	51.5	136,368,0	169	5.36	
		13	42	90,000,00	0		
		20	39,0	74,190,61	176	6.07	
		14	73	0,000,000			
		20	38,2	57,236,79	172	5.74	
		15	80	0,000,000			
		20	46,1	70,588,32	328	6.27	
		16	63	0,000,000			
		20	58.0	109,091,4	338	5.81	
		17	83	70,000,00	0		
		20	52,1	89,839,89	333	5.92	
		18	23	5,000,000			
		20	55,1	99,465,68	336	5.93	
		19	03	3,000,000			
2	Deli Serdang	20	50.6	19,985,33	358	9.22	
		13	18	0,000,000			
		20	46,4	38,894,80	362	7.50	
		14	92	0,000,000			
		20	43,7	27,982,95	321	5.24	
		15	89	0,000,000			
		20	79,8	120,301,4	559	5.32	
		16	18	30,000,00	0		
		20	66,3	72,258,93	526	5.1	
		17	76	0,000,000			
		20	73,0	96,280,18	543	5.15	
		18	97	0,000,000			
		20	69,7	84,269,55	535	5.18	
		19	37	5,000,000			
3	Serdang Bedagai	20	10.0	5,998,800,	54	5.8	
		13	07	000,000			
		20	10,4	7,343,240,	54	5.12	
		14	92	000,000			
		20	9,36	4,622,350,	47	5.05	
15	4	000,000					

		20	9,99	17,216,66	80	5.14	
		16	3	0,000,000			
		20	9,19	5,293,980,	66	5.17	
		17	4	000,000			
		20	9,59	11,255,32	73	5.17	
		18	4	0,000,000			
		20	9,39	8,274,650,	70	5.28	
		19	4	000,000			
4	Simalungu n	20	8,26	7,142,760,	48	5.25	
		13	6	000,000			
		20	7,79	6,414,330,	50	5.33	
		14	1	000,000			
		20	7,99	6,038,570,	45	5.24	
		15	7	000,000			
		20	8,22	12,266,87	57	5.4	
		16	4	0,000,000			
		20	12,9	13,903,78	57	5.13	
		17	88	0,000,000			
		20	10,6	13,085,32	57	5.18	
		18	06	5,000,000			
		20	11,7	13,494,55	57	5.2	
		19	97	3,000,000			
5	Asahan	20	6,96	7,057,510,	89	5.71	
		13	3	000,000			
		20	7,48	9,343,390,	89	5.88	
		14	1	000,000			
		20	7,34	7,483,840,	94	5.57	
		15	4	000,000			
		20	9,01	29,913,95	139	5.62	
		16	4	0,000,000			
		20	9,97	14,931,00	104	5.48	
		17	9	0,000,000			
		20	9,49	22,422,47	122	5.61	
		18	7	5,000,000			
		20	9,73	18,676,73	113	5.64	
		19	8	8,000,000			
6	Langkat	20	6,30	4,837,630,	59	5.61	
		13	3	000,000			
		20	6,74	4,953,300,	60	5.12	
		14	5	000,000			
		20	5,56	5,041,990,	54	5.03	
		15	7	000,000			
		20	6,30	20,444,79	95	4.98	
		16	6	0,000,000			
		20	9,95	19,351,58	90	5.05	
		17	1	0,000,000			
		20	8.12	19,898,18	93	5.02	
		18	9	5,000,000			
		20	9,04	19,624,88	92	5.07	
		19	0	3,000,000			
7	Pematangs iantar	20	4,76	3,977,190,	35	5.75	
		13	7	000,000			
		20	5,69	4,325,980,	36	6.34	
		14	1	000,000			
		20	5,50	4,903,240,	35	5.24	
		15	0	000,000			
		20	5,49	7,101,870,	33	4.86	
		16	0	000,000			
		20	4,63	5,432,800,	28	4.41	
		17	3	000,000			
		20	5.06	6,267,335,	31	4.8	
		18	2	000,000			
		20	4,84	5,850,068,	30	4.82	
		19	8	000,000			

8	Batubara	20	4,66	46,515,84	21	4.23
		13	8	0,000,000		
	20	4,66	36,741,68	22	4.2	
	14	3	0,000,000			
	20	4,76	10,694,27	20	4.14	
	15	1	0,000,000			
	20	4,79	5,165,000,	24	4.44	
	16	7	000,000			
	20	4,75	46,689,49	30	4.11	
	17	5	0,000,000			
20	4,77	25,927,24	27	4.38		
18	6	5,000,000				
20	4,76	36,308,36	29	4.35		
19	6	8,000,000				
9	Labuhan Batu Selatan	20	3,58	7,741,650,	23	6.05
		13	4	000,000		
	20	4,27	8,412,750,	23	5.31	
	14	7	000,000			
	20	4,06	10,475,68	20	5.14	
	15	8	0,000,000			
	20	4,97	5,380,210,	25	5.19	
	16	6	000,000			
	20	4,27	13,748,13	28	5.09	
	17	9	0,000,000			
20	4,62	9,564,170,	27	5.27		
18	8	000,000				
20	4,45	11,656,15	28	5.35		
19	4	0,000,000				
10	Labuhan Batu Utara	20	3,47	3,476,360,	18	6.27
		13	5	000,000		
	20	3,81	3,919,230,	21	5.39	
	14	8	000,000			
	20	4,23	4,555,390,	25	5.18	
	15	9	000,000			
	20	3,89	4,949,790,	23	5.21	
	16	8	000,000			
	20	4,58	8,339,480,	25	5.11	
	17	8	000,000			
20	4,24	6,644,635,	24	5.2		
18	3	000,000				
20	4,41	7,492,058,	25	5.15		
19	6	000,000				

Source: BPS Regencies/Cities

If it is observed from the data above that there are 10 best regencies/cities in absorbing labor in Sumatera Utara Province. Which occupies the top position in the number of labor demands, namely Deli Serdang Regency, which increased significantly in 2016. Then followed by Medan City and so on. This is in line with the increase in the number of companies and output which will affect the rate of growth in demand for labor. Interestingly, the highest economic growth of Deli Serdang Regency in 2013 was 9.22%, indicating good labor productivity and smooth economic activity.

Conceptually, the level of absorption of labor by the economic sector depends on several factors such as output, working capital, wage levels and the number of industries used by the sector (Yanuardani and Woyanti, 2009).

So based on the description above, this study will analyze "Factors Affecting Labor Demand in 10 Regencies/Cities in Sumatera Utara Province in 2013-2019" (Case Study: Medium and Large Industries).

2. THEORETICAL REVIEW

Labor Demand

In general, the theory of demand for labor is almost the same as the theory of demand for goods and services in economics. The demand for labor is the amount of labor demanded by a company at a certain wage level. While demand in economics is the amount of goods demanded by consumers at a certain price level. A company hires someone because that person helps produce goods or services to sell to consumers. The increase in the demand for labor companies for labor depends on the increase in public demand for the goods they produce (Sumarso 2003 in Rinaldi, 2005).

The demand for labor is influenced by the demand for a product so that the company will add labor to its production if the demand for production goods increases. Therefore, the demand for labor is referred to as derived demand (Borjas, 2016; McConnell, Brue, & Macpherson, 2013; Santoso, 2012; Simanjuntak, 1985).

To maintain the workforce used by the company, the company must maintain public demand for goods produced to be stable or possibly increase. In maintaining the stability of demand for goods produced by the company, it can be done by implementing exports, so that companies must have the ability to compete both for domestic and foreign markets. Thus, it is expected that the company's demand for labor can be maintained as well (Sumarsono, 2003).

Output

Output is the output value generated from the process of industrial activities in the form of goods produced, which will then be sold to the consumer community. The increase in employers' demand for labor depends on the increase in public demand for goods produced by the workforce. The number of goods produced depends on the level of consumer demand. The higher consumer demand for goods produced by the company, the higher the company's demand for labor. Where, entrepreneurs will hire someone because someone helps produce goods or services for sale to the consumer community (Simanjuntak, 1985).

Number of Companies

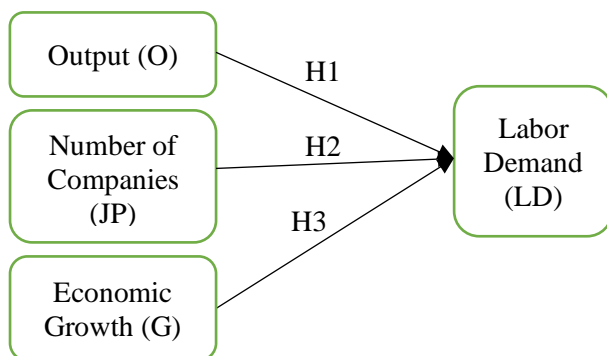
Company or industrial business is a business unit that carries out economic activities, aiming to

produce goods or services. Squire in Setiawan (2010) argues that in general, the growth of business units in a production sector in a region will increase the number of workers. The number of business units has a positive influence on the number of workers. That is, if the number of business units increases, the number of workers needed by the business unit concerned will also increase.

Economic growth

The economic growth of a country can be measured by the growth of gross domestic product (GDP), which is an indicator of national income. Understanding income according to Muana Nanga (2005:274) is the level of prosperity of a country as measured by Gross Domestic Product. The total number of products produced by the entire population, the level of per capita income can be determined by dividing the total GDP achieved by the total population. Income is the result obtained from production activities that use production factors consisting of land, labor, capital and skills, companies carry out activities that require production factors that are available in the community. Sukirno (2006:424)

Conceptual Framework



Picture 1.
Conceptual Framework

The conceptual framework is Figure 1 above explaining the influences between the independent and dependents variable, namely the effect of the output (O), the number of companies (JP), the economic growth (G) on the labor demand (LD) which will be tested partially by using the t test, and together all the independent variables on the dependent using the f tests.

Hypothesis

The alternatives hypothesis given in this study are as follows:

H1: It is suspected that the output has a positive and significant effect to labor demand.

H2: It is suspected that the number of companies has a positive and significant effect to labor demand.

H3: It is suspected that the economic growth has a positive and significant effect to labor demand.

3. RESEARCH METHOD

Research object and location

The research objects used in this study are the Output, Number of Companies and Economic Growth as independent variables and Labor Demand as the dependent variable. The research location is in 10 regencies/cities on Sumatera Utara Province.

Types and Sources of Data

The types of data to be analyzed in this study is quantitative data, namely secondary data during the 2013-2019 period obtained from various related agencies, namely the Central Bureau of Statistics (BPS) in 10 regencies/cities on Sumatera Utara Province.

Data collection technique

The data used in this research is secondary data, which is taken directly from the BPS of Sumatera Utara Province in the form of the annual reports in Figures 2013-2019 which contains data on the output, the number of companies, the economic growth and the labor demand.

Operational Definition of Variables

The research variables that will be examined in this study can be defined as follows:

1. Labor Demand (LB)

The labor absorption in question is the number of workers working in the Manufacturing Industry (Large and Medium) in Deli Serdang Regency (thousands of people).

2. Output (O)

Output value is the output value produced by the manufacturing industry (Large and Medium) in Deli Serdang Regency (billion rupiah).

3. Number of Companies (JP)

Number of Industrial Units (Large and Medium) is the number of business units that carry out economic activities, aiming to produce goods or services on a large and medium scale (units).

4. Economic Growth (G)

Regional Economic Growth (Y), expressed as changes in GRDP at constant prices in each district/city in North Sumatra Province in 2013-2019 (in percent) which is calculated using the formula:

$$Y_{it} = \frac{PDRB_{t1} - PDRB_{t0}}{PDRB_{t0}} \times 100\%$$

Y_{it} = District/city economic growth i year t

$PDRB_{t1}$ = GDRP district/city i year t

$PDRB_{t0}$ = GDRP district/city I year t-1

Data analysis method

Regression Analysis

The analytical method used in this study is a regression analysis method with panel data, which is a combination of data between units (cross section) and time series data.

There are several types of data available for statistical analysis, including time series, cross section data and panel data. Panel data is a combination of time series and cross section data. Panel data is often called pooled data (pooling time series and cross section), micropanel data, longitudinal data, event history analysis, and cohort analysis. All of these terms mean the movement over time of the cross sectional unit. In simple terms, panel data can be defined as a data set (dataset) in which the behavior of cross-sectional units (eg individuals, companies, countries) is observed over time (Ghozali and Ratmono, 2013).

In this study, the time series data used were 2013-2019 and the cross section data were 10 regencies/cities in Sumatera Utara Province, resulting in 70 observations. The data used in this study were sourced from the Official Website of the Central Bureau of Statistics (BPS) of Sumatera Utara Province. Data processing is done using Econometric Views (E-Views).

The model used in this study is as follows:

$$LD_{it} = 0 + 1O_{it} + 2JP_{it} + 3G_{it} + e_{it}$$

Information:

LD = Labor Demand

t = Number of years studied

i = Regency/City

β = Parameters related variables

O = Output

JP = Number of companies

G = Economic Growth

e = Confounding variable

Parameter Estimation on Panel Data Regression

It is possible that the more explanatory variables the more complex the parameter estimation, so that several methods are needed to estimate the parameters, such as the common effect model (CEM) approach, fixed effect model (FEM) and random effect model (REM).

Common Effect Model (CEM)

In this common effect model (CEM) method, we combine all data regardless of the time and place of research. It is assumed that the behavior of the data between the cross-sectional units is the same in various time periods.

According to Sukendar and Zinal (2007), in this approach it is assumed that the intercept value of each variable is the same, as well as the slope coefficient for all cross-section and time series units (Dody Apriliawan, et al., 2013).

In estimating the parameters of the common effect model, it can be done using Ordinary Least Square (OLS) (Tyas Ayu Prasanti et al., 2015).

The common effect model with explanatory variables can be written as follows (Dody Apriliawan, et al., 2013):

$$y_{it} = \beta + \beta'X_{nit} + \varepsilon_{it}$$

Fixed Effect Model (FEM)

According to Gujarati (2003), one way to pay attention to the heterogeneity of cross section units in the panel data regression model is to allow different intercept values for each cross section unit but still assume a constant slope (Tyas Ayu Prasanti, 2015).

The regression equation for the fixed effect model is as follows:

$$y_{it} = \beta_i + \beta'X_{it} + \varepsilon_{it}$$

Random Effect Model (REM)

The random effect estimation model assumes that individual effects are random for all cross-sectional units. The REM regression equation is as follows (William H Greene, 1990).

$$y_{it} = \beta_i + \beta'X_{it} + \varepsilon_{it}$$

Best Model Selection

The selection of the best model for panel data regression can be done by calculating the following:

Chow test

Chow test is used to select the common effect and fixed effect models. Chow test statistics are stated in the following equation (Greene, 2008 quoted from Tyas Ayu Prasanti, 2015).

$$F = \frac{(SSE_{CEM} - SSE_{FEM}) / (N - 1)}{SSE_{FEM} / (NT - N - k)}$$

Hausman test

Hausman test is used to determine whether the model follows FEM or REM. The Hausman test follows the chi-square distribution with the Wald criteria with the Hausman test equation, namely (Ayu Shinta Pusakasari, 2015):

$$W = [b - \beta^c]' \sum [b - \beta^{c-1}]$$

Classic assumption test

The panel data regression model can be said to be a good model if it meets the Best, Linear, Unbiased, and Estimator (BLUE) criteria. BLUE can be achieved if the model satisfies the following classical assumptions:

Multicollinearity Test

Multicollinearity means that there is a perfect or exact relationship between some or all of the independent variables in the regression model (Gujarati, 2004).

Multicollinearity can be detected by testing with the auxiliary regression method taken from the Client's rule of thumb (Damodar Gujarati, 2003), namely the R2 (initial) value in the regression between the dependent variable and all independent variables compared to the R2 value in the regression between one independent variable. other independent variables. If the initial R2 > R2 then the three variables are indeed feasible or useful to be included in the model.

Heteroscedasticity Test

Heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another observation (Ghozali, 2007).

Heteroscedasticity testing in this study will use the Park test. The test criteria is to compare the value of tcount with ttable. If thitung > ttable, there is no heteroscedasticity problem.

Parameter Significance Test Simultaneous Test (F Test)

The F test is used to determine whether the explanatory variables simultaneously

(simultaneously) significantly affect the dependent variable (Gujarati; 2004).

The null hypothesis will be rejected if the calculated F is greater than or the p-value is less than the predetermined significance level. That is, at least one independent variable in the model affects the dependent variable. $F(\alpha; k-1; n-k)$.

Partial Test (t Test)

Testing the significance of the partial regression coefficient was carried out using the t-test. The t-test is used to determine and see the significance of the influence of individual independent variables on the dependent variable, assuming other variables are constant (Gujarati; 2004).

Coefficient of Determination

The coefficient of determination (R2) is a value that shows the magnitude of changes that occur caused by other variables, the coefficient of determination is used to determine the percentage of the magnitude of the relationship between predictor variables and response variables (Pambudi, 2013).

4. RESULTS AND DISCUSSION Common Effect Model (CEM) Method

Table 3.
Common Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12385.62	3437,676	-3.602907	0.0006
O?	2.18E-10	2.20E-11	9.912773	0.0000
JP?	96.91195	5.320517	18.21476	0.0000
G?	2298,033	655.1835	3.507465	0.0008
		Mean dependent var	16373.97	
R-squared	0.971846	SD dependent var	20368.93	
Adjusted R-squared	0.970566	of Akaike info criterion	19.21124	
SE of regression	3494552	Schwarz criterion	19.33973	
Sum squared resid	8.06E+08	Hannan-Quinn Criter.	19.26228	
Likelihood logs	-668.3935	Durbin-Watson stat	1.119610	
F-statistics	759.4140	Prob(F-statistic)	0.000000	

The results show that the value of R2 of 0.97. This means that the model is able to explain variations in labor demand by 97%. While the remaining 3% is influenced by other variables outside the model. Furthermore, each variable

coefficient shows a positive and significant influence on the demand for labor, which means that as output increases, the number of companies and economic growth increases, the demand for labor will also increase.

This pooled regression model assumes that each region has the same intercept, namely -12385.62 as well as its slope, each region is considered to have the same slope, namely 2.18 for the output variable, 96.91 for the number of companies variable, and 2298.03 for the economic growth variable.

Fixed Effect Model (FEM) Method

Table 4.
Fixed Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3940.726	2771.827	1.421707	0.1606
O?	1.60E-10	1.98E-11	8.102890	0.0000
JP?	67.06560	6.658557	10.07209	0.0000
G?	146.0139	456.6945	0.319719	0.7504
Fixed Effects (Cross)				
_MEDAN--C	11512.03			
_DELISER DANG--C	15365.02			
_SERDAN GBEDAG AI--C	-614.0141			
_SIMALU NGUN--C	-249.7080			
_ASAHAN --C	-5889,745			
_LANGKA T--C	-4611.393			
_PEMATA NGSANT AR--C	-2605,333			
_BATUBA RA--C	-6240.188			
_LABUHA NBATUSE LATAN--C	-3596,739			
_LABUHA NBATUUT ARA--C	-3069,928			

Effects Specification

Cross-section

fixed (dummy variables)

		Mean dependent var	
R-squared	0.993476	16373.97	
Adjusted R-squared	0.992103	20368.93	
SE of regression	1810.108	18.00615	
Sum squared resid	1.87E+08	18.42372	
Likelihood logs	-617.2151	18.17201	
F-statistics	723,3572	2.635841	
Prob(F-statistic)	0.000000		

The estimation results using the Fixed Effect Model (FEM) approach show that the regional output variable is statistically significant at =5% with a coefficient of 0.0000. The variable number of regional companies is statistically significant at =0.0000. Regional economic growth variable is not statistically significant at =5% with a coefficient of 0.7504.

Of the ten regions, Deli Serdang Regency has the highest intercept/constant level of labor demand with a total of 15365.02. Then followed by Medan City, Simalungun Regency, Pematangsiantar City, Labuhan Batu Utara Regency, Labuhan Batu Selatan Regency, Langkat Regency, Asahan Regency, Serdang Bedagai Regency, and Batubara Regency.

Furthermore, the model's ability to explain the effect of fluctuations in output, number of companies, and economic growth on labor demand through the R-squared number is 0.99 or 99%. While the remaining 1% is influenced by other variables outside the model.

Random Effect Model (REM) Method

Table 5.
Random Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2507.050	2648,565	-0.946569	0.3473
O?	1.71E-10	1.88E-11	9.074132	0.0000
JP?	83.41888	5.566306	14.98640	0.0000
G?	956.4023	427.2627	2.238441	0.0286
Random Effects (Cross)				

_MEDAN--C	7502.550
_DELISERDANG	
—C	8246.255
_SERDANGBED	
AGAI--C	429.2314
_SIMALUNGUN	
—C	919.7215
_ASAHAN--C	-5647.692
_LANGKAT--C	-3549.203
_PEMATANGSI	
ANTAR--C	-895.9321
_BATUBARA--C	-3780.067
_LABUHANBAT	
USELATAN—C	-1891,666
_LABUHANBAT	
UUTARA--C	-1333.198

Effects Specification			
		SD	Rho
Cross-section random		3016.001	0.7352
Idiosyncratic random		1810.108	0.2648

Weighted Statistics			
R-squared	0.9029	Mean dependent var	3622,282
Adjusted R-squared	0.8957	SD dependent var	6542,324
SE of regression	70	Sum squared resid	2.94E+08
F-statistics	198.64	Durbin-Watson stat	1.911342
Prob(F-statistic)	0.0000		

Unweighted Statistics			
R-squared	0.9407	Mean dependent var	16373.97
Sum squared resid	1.69E+09	Durbin-Watson stat	0.332091

The estimation results above show the average value of the intercept coefficient for panel data is -2507.050. While the random effect coefficient of each region when added up is equal to zero.

Furthermore, the output coefficient and the number of companies have a significant effect on changes in labor demand because they have a t-count value greater than t-table or a probability less than 0.05.

Based on the calculation results, if each region increases by one unit of output it will increase the demand for labor by 1.71 evenly for each region.

Furthermore, $R^2 = 0.90$ means that the fluctuations in labor demand are explained by variations in the rise and fall of output, the number of companies and economic growth by 90%, while

the remaining 10% is influenced by other variables outside the model.

Best Model Selection

Chow test

Table 6.
Chow Test Estimation Results

Redundant Fixed Effects Tests			
Pool: PANEL			
Test cross-section fixed effects			
Effects Test	Statistics	df	Prob.
Cross-section F	20.998926	(9.57)	0.0000
Cross-section Chi-square	102.356869	9	0.0000

Therefore, P-Value < 0.05 means H_0 is accepted, so it is identified that the fixed effects model is more appropriate than the common effect model.

Hausman test

Table 7.
Hausman Test Estimation Results

Correlated Random Effects - Hausman Test				
Pool: PANEL				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.	
Cross-section random	26.873914	3		0.0000

Therefore, P-Value < 0.05 means H_1 is accepted, so it is identified that the random effects model is more appropriate than the fixed effects model.

Based on the Chow test and Hausman test, the best model is the fixed effects model (FEM). So that the best equation is obtained, namely:

$$LDit = 3940.726 + 1,60.10^{-10}Oit + 67.06560Jpit + 146.0139GitG + eit$$

Classic assumption test

Multicollinearity Test

Table 8.
Multicollinearity Test Estimation Results

Dependent Variable	Independent Variable	R2
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Labor Demand	Output, Number of Companies, Economic Growth	0.993476
Output	Labor Demand, Number of Firms, Economic Growth	0.944075
Number of Companies	Labor Demand, Output, Economic Growth	0.980611
Economic growth	Labor Demand, Output, Number of Firms	0.575075

Based on the calculation results of the auxiliary regression method, the R² value is 0.993476 and the R² value of the three independent variables is smaller than the initial R² value. It can be concluded that multicollinearity in research is not a problem.

Heteroscedasticity Test

Table 9.

Heteroscedasticity Test Estimation Results

Variable	Thitung	Sig n	Ttable	Information
Output	8.102890	>	199656	Free of heteroscedasticity
Number of Companies	10.07209	>	199656	Free of heteroscedasticity
Economic growth	0.319719	<	199656	Heteroscedasticity

The calculation results show that there is no heteroscedasticity disorder that occurs in the model parameter estimation process, where all variables are free from heteroscedasticity and only one variable is not free from heteroscedasticity, namely economic growth. So it can be concluded that there is no heteroscedasticity problem in this study.

Parameter Significance Test Simultaneous Test (F Test)

Table 10.

F Test Estimation Results

F-statistics	723,3572
Prob(F-statistic)	0.000000

Based on the simultaneous significant test table, it can be concluded that the Fhitung = 723,3572 is obtained. Then to obtain the value of Ftable, it can be seen from table F with a significant level of = 0.05 then the value of Ftable = 2.74 is obtained with the rejection area if Fhitung > Ftable then H₀ is rejected. This means that it can be concluded that there is a significant influence between the output variables, the number of

companies, and economic growth on the demand for labor.

Partial Test (t Test)

Table 11.

t test estimation results

Variable	t-Statistic	Prob.
C	1.421707	0.1606
O?	8.102890	0.0000
JP?	10.07209	0.0000
G?	0.319719	0.7504

From the table above, the results show that the output and number of companies that have a probability value is less than 0.05. So at the 5% significance level, it can be concluded that the output and number of companies have a significant effect on labor demand, while economic growth has no significant effect on labor demand.

Coefficient of Determination (R²)

Table 12.

Coefficient of Determination Estimation Results

R-squared	0.993476
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The coefficient of determination of the best model results, namely the fixed effect model that has been obtained, is 0.99. This means that the model's ability to explain the effect of fluctuations in output, number of firms, and economic growth on labor demand through the R-squared number is 0.99 or 99%. While the remaining 1% is influenced by other variables outside the model.

5. CONCLUSION AND SUGGESTION

Conclusion

The demand for labor in the medium and large industrial sectors is simultaneously influenced by output, number of companies, and economic growth. If viewed by partial test (t test), the output variable and the number of companies have a positive and significant effect on labor demand. Meanwhile, the variable of economic growth has a positive but not significant effect on the demand for labor.

Suggestion

Based on the results of research conducted by researcher, there are several suggestion, namely:

- For academics, there is a need for further researchs using the same variables in all districts and cities throughout Indonesia. This aims to have a wider coverage and not only part of the area. So that every incident in the region can be known by the public.

- b. Based on the results of the research above, several solutions can be taken to increase employment in 10 regencies/cities in the Sumatera Utara Province, namely the government needs to provide business capital assistance for developing industries and the government opens the widest opportunity for investors who want to build a business with the provisions -applicable provision.
- c. It is hoped that the government's role in increasing human resources so that industrial production activities increase. This increase can be done by increasing education such as schools and skills training, so that it can meet industry standards in employment.

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