DO MINIMUM WAGE, EDUCATION, AND ECONOMIC GROWTH MATTER? ANALYSIS OF UNEMPLOYMENT RATE IN NORTH SULAWESI INDONESIA

JOSEP B. KALANGI [1]*, VECKY A. J. MASINAMBOW [2] and LINTJE KALANGI [3]

[1,2,3] Faculty of Economics and Business, Sam Ratulangi University, Indonesia.
*Corresponding Author Email: josepbkalangi@unsrat.ac.id

Abstract

This study examines the effects of minimum wage, average education, and economic growth levels on unemployment rates in North Sulawesi Province in Indonesia. The data used for this study are retrieved from the Central Statistics Agency of North Sulawesi Province. This study employs panel data regression model, particularly the random effect model (REM). We obtained the following results: (1) the minimum wage level has a negative and significant relationship to the unemployment rate; (2) the average education level has a positive and significant relationship to the unemployment rate; (3) while the economic growth has a negative and significant relationship to the unemployment rate. Notably, the positive impact of education level on unemployment rate provides interesting evidence, suggesting the need to improve the quality of graduates to meet the industry needs.

Keywords: Unemployment Rate; Minimum Wage Rate; Average Education Level; Economic Growth Rate.

1. INTRODUCTION

Unemployment is one of the macroeconomic problems in an economy. Every country will always experience unemployment. This is known as the natural unemployment rate. This term means that the unemployment rate cannot disappear for a country at all times, both in the short and long term. Unemployment is also a serious socio-economic and personal problem based on two reasons, namely (1) loss of income and production (2) loss of human resources. Losing a job causes loss of income and production. This loss is devastating to the people who suffer it and they make unemployment a terrible prospect for everyone. Furthermore, loss of production means lower consumption and low capital investment, thus lowering the standard of living now and in the future (Parkin, 2018). According to Mankiw (2018), unemployment will always arise in an economy for several reasons. The first reason is the job search process, namely the time it takes to match workers and jobs. The second reason is because of wage rigidity. This wage rigidity can be caused by three things, namely the existence of a minimum wage policy, the monopoly power of trade unions, and wage efficiency. Unemployment can also occur due to inadequate education levels and low health and nutrition, so that many workers are unemployed because their education levels do not meet the qualifications for available job vacancies.

Sulawesi Province is included in the list of unemployment rates above the national average in 2023, which is in 33rd position out of 38 provinces in Indonesia. This shows that North Sulawesi Province has a high unemployment rate. In addition, if we compare North Sulawesi Province with other provinces on the island of Sulawesi, the unemployment rate is in first place.

In other words, the unemployment rate for North Sulawesi Province is at the highest level in the provinces throughout Sulawesi. The unemployment rate is usually influenced by many factors (variables). However, in this study, only the minimum wage (MW), average education level (AEL), and economic growth (EG) variables will be used. Furthermore, to determine the effect of these three variables on the unemployment rate (UR) in North Sulawesi Province, this study uses the linear regression analysis method. Therefore, the researcher wishes to research the unemployment rate in North Sulawesi Province because it is important to know how and how much the variables mentioned above influence the unemployment rate in North Sulawesi Province.

2. METHODS

2.1 Data

This study uses secondary data obtained from the Central Statistics Agency (BPS) of North Sulawesi Province. The type of data used is quantitative data taken from the variables of minimum wage level, average education level, economic growth rate, and unemployment rate. Data from all these variables were taken from districts and one city in North Sulawesi Province.

2.2 Regression model

The data are analyzed using the statistical inference method, namely the panel data regression model. This model is a combination of time series data and cross-section data. The panel data regression model in this study is used to determine the effect of three independent variables, namely: minimum wage level, average education level, economic growth rate on one dependent variable, namely: unemployment rate. The form of the functional relationship is as follows:

$$UR = (MW, AEL, EG) \qquad (2.1)$$

where: UR = *Unemployment Rate*

MW = *Minimum Wage Rate* AEL = *Average Education Level* EG = *Economic Growth*

From the functional relationship form (2.1) above, it can be transformed into a panel data regression equation model of the random effect model (REM) as follows:

$$UR_{it} = \beta_0 + \beta_1 MW_{it} + \beta_2 AEL_{it} + \beta_3 EG_{it} + \varepsilon_i + u_{it} \text{ atau}$$

$$\beta_0 + \beta_1 MW_{it} + \beta_2 AEL_{it} + \beta_3 EG_{it} + w_{it} \qquad (2.2)$$

where: $w_{it} = \varepsilon_i + u_{it}$ (*error term*)

ε_i = *error term* from *cross section*

u_{it} = *error term* from *cross section* and *time series*

$i = 1, 2, \ldots 15$ (11 regions and 4 cities)

$t = 1, 2, \ldots\ldots\ldots\ldots\ldots\ldots 13$ (period from 2010 to 2023)

β_0 = constant

$\beta_1; \beta_2; dan \beta_3$ = coefficients of MW, AEL, and EG

3. RESULTS AND DISCUSSIONS

3.1 Descriptive statistics

In this study, the data used are data from four variables, namely unemployment rate data, minimum wage rate data, average education level data, and economic growth rate data. Descriptive statistics of the data from these four variables can be seen in Table 3.1 below.

Table 3.1: Descriptive statistics

	UR?	C	MW	AEL	EG
Mean	6.697231	1.000000	2285019.	8.774205	5.478462
Median	6.210000	1.000000	2400000.	8.820000	6.030000
Maximum	14.28000	1.000000	3310723.	11.43000	8.840000
Minimum	1.710000	1.000000	1000000.	6.660000	-3.160000
Std. Dev.	2.640278	0.000000	838779.5	1.140571	1.931834
Skewness	0.487558	NA	-0.222711	0.210634	-1.964247
Kurtosis	2.806025	NA	1.613141	2.318694	7.108708
Jarque-Bera	8.031391	NA	17.23944	5.213365	262.5556
Probability	0.018030	NA	0.000181	0.073779	0.000000
Sum	1305.960	195.0000	4.46E+08	1710.970	1068.300
Sum Sq. Dev.	1352.387	0.000000	1.36E+14	252.3750	724.0045
Observations	195	195	195	195	195
Cross sections	15	15	15	15	15

Based on Table 3.1 above, it can be seen that the average (mean) unemployment rate (UR) is 6.69%, the highest UR is 14.28% and the lowest UR is 1.71%; the average (mean) minimum wage (MW) is Rp. 2,285,019, the highest value is Rp. 3,310,723, - and the lowest value is Rp. 1,000,000, -; the average (mean) level of education (AEL) is 8.77 years, the highest is 11.43 years and the lowest is 6.66 years; and the average (mean) economic growth rate (EG) is 5.48%, the highest is 8.84% and the lowest is -3.16%. The number of observations in this study is 195 data, consisting of 15 cross-section data in 15 districts and cities throughout North Sulawesi Province, and 13-time series data.

3.2 Correlation

Based on the results of correlation calculations using E-View software where the unemployment rate (UR) is the dependent variable; and the provincial minimum wage (WM), average education level (AER) and growth (EG), as the independent variables, the output results can be seen in Table 3.2 below.

Table 3.2: Correlation matrix

	UR	MW	AEL	EG
UR	1,0000			
MW	-0,2528	1,0000		
AEL	0,4542	0,3456	1,0000	
EG	0,0677	-0,4351	-0,0962	1,0000

Based on Table 3.2 above, it can be seen that,

1) The unemployment rate variable (UR) has a correlation coefficient with the minimum wage rate variable (MW), which is -0.2528. This means that the correlation is negative and weak.

2) The unemployment rate variable (UR) has a correlation coefficient with the average education level variable (AEL), which is 0.4542. This means that the correlation is positive and moderate.

3) The unemployment rate variable (UR) has a correlation coefficient with the economic growth rate variable (EG), which is 0.0677. This means that the correlation is positive and quite weak.

4) The correlation coefficients of the three independent (explanatory) variables, namely the MW and AEL variables are 0.34; the MW and EG variables are -0.43; the AEL and EG variables are -0.096. This shows that there is no multicollinearity.

3.3 Panel regression analysis

Based on the results of panel data regression calculations using E-View software where the unemployment rate (UR) is the dependent variable; and the provincial minimum wage (WM), average education level (AER) and growth (EG), as the independent variables (see Appendix 1), the results of the regression equation can be written as follows.

$$UR_{it} = 1,116154 - 0,00000145MW_{it} + 1,0993AEL_{it} - 0,1372EG_{it} + u_{it} \quad (3.1)$$

Based on the panel data regression equation (3. 1) above, the average constant for all districts and cities in North Sulawesi Province is 1.116154. This means that if the minimum wage (MW) variable, the average education level (AEL) variable, the economic growth rate (EG), and other disturbance variables (u) are considered unchanged or equal to zero, then the average unemployment rate in North Sulawesi Province is 1.12% (this figure is rounded).

The regression coefficient of the minimum wage (MW) is -0.00000145, which means it has a negative relationship to the unemployment rate (UR), then if the minimum wage (MW) variable increases by IDR 100,000, then the average unemployment rate (UR) in North Sulawesi Province will decrease by 0.15%, assuming other variables are considered fixed or constant.

The regression coefficient of the average level of education (AEL) is 1.0993, which means it has a positive relationship with the unemployment rate (UR), then if the average level of education (AEL) variable increases by 1 year, then the average unemployment rate (UR) in North Sulawesi province will increase by 1.10% assuming other variables are considered fixed or constant.

The regression coefficient of the economic growth rate (EG) variable is -0.1372, which means it has a negative relationship with the unemployment rate (UR), then if the Economic Growth rate (EG) variable increases by 1%, then the average unemployment rate (UR) in North Sulawesi province will decrease by 0.14% assuming other variables are considered fixed or constant.

3.3.1 Results of t-Test on Minimum Wage Level (MW)

Hypothesis Ho: β1 = 0, meaning that the minimum wage level (MW) variable does not significantly affect the unemployment rate (UR).

H1: β1 ≠ 0, meaning that the minimum wage level (MW) variable significantly affects the unemployment rate (UR).

Based on the calculation results (see Appendix 1), the t-stat value is -6.624 or the probability value (p-value) = 0.000 or 0.0% for the regression coefficient of the minimum wage level variable. By using a significance level of 0.05 or 5%, this shows that the p-value is smaller than the significance level value (p = 0.000 < α = 0.05), then H0 is rejected and H1 is accepted. This means that partially the minimum wage level (MW) variable has a significant effect on the unemployment rate (UR). So it can be concluded that the minimum wage level variable can influence the unemployment rate in North Sulawesi at a significance level of α = 0.05.

3.3.2 Results of t-Test on Average Education Level (AEL)

Hypothesis Ho: β2 = 0, meaning that the average education level (AEL) variable does not significantly affect the unemployment rate (UR).

H1: β2 ≠ 0, meaning that the average education level (AEL) variable significantly affects the unemployment rate (UR).

Based on the calculation results (see Appendix 1), the t-stat value is 3.004 or the probability value (p-value) is 0.003 or 0.3% for the regression coefficient of the average education level (AEL) variable. Using a significance level of 0.05 or 5%, this shows that the p-value is smaller than the significance level (p = 0.003 < α = 0.05), so H0 is rejected and H1 is accepted. This means that partially the average education level (AEL) variable has a significant effect on the unemployment rate (UR). So it can be concluded that the average education level (AEL) variable can influence the unemployment rate (UR) in North Sulawesi at a significance level of α = 0.05.

3.3.3 Results of t-Test on Economic Growth (EG)

Hypothesis Ho: β3 = 0, meaning that the economic growth rate (EG) variable does not significantly affect the unemployment rate (UR).

H1: β3 ≠ 0, meaning that the economic growth rate (EG) variable significantly affects the unemployment rate (UR).

Based on the calculation results (see Appendix 1), the t-stat value is -2.381 or the probability value (p-value) = 0.018 or 1.8% for the regression coefficient of the economic growth rate (EG) variable. By using a significance level of 0.05 or 5%, this shows that the p-value is smaller than the significance level value (p = 0.018 < α = 0.05), then H0 is rejected and H1 is accepted. This means that partially the economic growth rate (EG) variable has a significant effect on the unemployment rate (UR). So it can be concluded that the economic growth rate variable can affect the unemployment rate (UR) in North Sulawesi at a significance level of α = 0.05.

3.3.4 Coefficient of Determination (R^2)

Based on the output results in the calculation (see Appendix 1), the coefficient of determination (R2) value is 0.2416 or 24.16 percent and the adjusted R2 value (Adjusted R- squared) is 0.2297 or 22.97 percent.

The coefficient of determination (R2) value of 0.2416 or 24.16 percent shows that the three variables, namely the minimum wage level, average education level, and economic growth level are able to explain 24.16 percent of the variation in the unemployment rate and the remaining 75.84 percent of the variation is explained by other variables that are not independent variables.

4. CONCLUSIONS

Based on the results of data analysis, the following conclusions can be obtained:

1) The minimum wage level (MW) has a negative and significant effect on the unemployment rate (UR) in North Sulawesi Province.

2) The average level of education (AEL) has a positive and significant effect on the unemployment rate (UR) in North Sulawesi Province.

3) The economic growth rate (EG) has a negative and insignificant effect on the unemployment rate (UR) in North Sulawesi Province.

4) The minimum wage level (MW), the average level of education (AEL), and the economic growth rate (EG), together (simultaneously) have a significant effect on the unemployment rate (UR) in North Sulawesi Province.

5. RECOMENDATIONS

Based on the research results, the suggestions that can be given in this study are as follows. The results of the study show that the average level of education (AEL) has a positive effect on the unemployment rate (UR).

This means that the higher the average level of education, the higher the unemployment rate in North Sulawesi Province. Of course this is not in accordance with what is desired. This may be because graduates from schools or universities/faculties have skills or expertise that do not match what is needed by companies or employers in North Sulawesi Province.

Also, this shows that there is a tendency in North Sulawesi Province to have what is called structural unemployment, where there are many jobs available, but they do not match the skills of job seekers.

Therefore, it is recommended that the government, in this case the North Sulawesi Provincial Government, should cooperate with schools or universities or educational institutions in order to produce graduates who are in accordance with the needs of the labor market in North Sulawesi Province.

References

1) Badan Pusat Statistik (BPS), Provinsi Sulawesi Utara. Badan Pusat Statistik (BPS), Indonesia.

2) Blanchard O and David R. Johnson (2013), **Macroeconomics**, Sixth Edition, Pearson Education, Inc, USA

3) Case E.Karl, Ray C. Fair, dan Sharon M.Oster (2020), **Prinsip-prinsip Ekonomi Jilid 2**, Edisi ke-13, Penerbit Erlangga: Jakarta

4) Ghozali Imam H dan Dwi Ratmono (2017), **Analisis Multivariat Dan Ekonometrika: Teori, Konsep, Dan Aplikasi dengan Eviews 10**, Edisi ke-2, Badan Penerbit Universitas Diponegoro, Semarang.

5) Gujarati N. Damodar dan Dawn C. Porter (2012), **Dasar-dasar Ekonometrika**, Edisi ke-5, Penerbit Salemba Empat, Jakarta.

6) Malangkas T.S.M, Agnes L.Ch.P Lapian, Hanly F.Dj. Siwu (2022)," Pengaruh Upah Minimum Provinsi Danjumlah Penduduk Terhadap Pengangguran Di Provinsi Sulawesi Utara", Jurnal Berkala Ilmiah Efisiensi, Volume22No.5 Bulan Juli 2022.

7) McEachern A. William, (2000). **Economics: A Contenporary Introduction**, South-Western College Publishing, Thomson Learning, USA.

8) Mankiw N.Gregory (2018). **Pengantar Ekonomi Makro**, Edisi ke-7, Penerbit Salemba Empat: Jakarta.

9) Muhammad Firdaus, dkk (2023). **Aplikasi Model Ekonometrika Dengan RStudio (Time- Series, Panel, Spatial)**, Edisi ke-2, Penerbit IPB Press, Kota Bogor

10) Okun, A. M. (1962). Potential GNP: Its Measurement and Significance. *In Proceedings of the Business and Economic Statistics Section of the American Statistical Association*. Alexandria, VA. American Statistical Association, 89-104.

11) Parkin Michael (2018), **Ekonomi Makro**, Edisi ke-11, Penerbit Salemba Empat: Jakarta. Polla E.F, Een N. Walewangko, Steeva Y.L Tumangkeng (2021)," Pengaruh Tingkat

12) Pendidikan, Pertumbuhan Ekonomi, Dan Upah Minimum Terhadap Pengangguran Di Kabupaten Minahasa Selatan Tahun 2009-2019", Jurnal Berkala Ilmiah Efisiensi, Volume 21 No. 02 September 2021.

13) Tumilaar T. V, M.Th. B. Maramis, H.F.Dj. Siwu (2022), "Pengaruh Jumlah Penduduk, Pendidikan, Dan Upah Minimum Terhadap Tingkat Pengangguran Terbuka Di Kabupaten/Kota Provinsi Kalimantan Timur", Jurnal Berkala Ilmiah Efisiensi, Volume22 No.5 Bulan Juli 2022.

14) Wooldridge M. Jeffrey (2020), **Introductory Econometrics: A Modern Approach**, Seventh Edition, Cengage Learning Inc, USA.

APPENDICES

Appendix 1: REM regression output

Dependent Variable: UR?				
Method: Pooled EGLS (Cross-section random effects)				
Date: 07/10/24 Time: 14:08				
Sample: 1 13				
Included observations: 13				
Cross-sections included: 15				
Total pool (balanced) observations: 195				
Swamy and Arora estimator of component variances				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	1.116154	2.863100	0.389841	0.6971

MW?	-1.45E-06	2.19E-07	-6.623991	0.0000
AEL?	1.099305	0.365888	3.004488	0.0030
EG?	-0.137186	0.057622	-2.380787	0.0183
Random Effects (Cross)				
BMI—C	0.008194			
BMS—C	0.398797			
BMT—C	1.299447			
BMU—C	-0.154919			
BTG—C	2.942604			
KTG—C	-0.229822			
MDO—C	2.108885			
MHS—C	0.005710			
MSL—C	-0.434838			
MTG—C	-1.645824			
MUT—C	0.974025			
SGH—C	0.083999			
STB—C	-2.370075			
TAL—C	-3.291826			
TMH—C	0.305642			
Effects Specification				
			S.D.	Rho
Cross-section random			1.705811	0.6154
Idiosyncratic random			1.348657	0.3846
Weighted Statistics				
R-squared	0.241634	Mean dependent var		1.434485
Adjusted R-squared	0.229722	S.D. dependent var		1.539733
S.E. of regression	1.351354	Sum squared resid		348.7962
F-statistic	20.28576	Durbin-Watson stat		1.634156
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.385124	Mean dependent var		6.697231
Sum squared resid	831.5497	Durbin-Watson stat		0.685452

Appendix 2: Hausman test

UJI HAUSMAN (Menguji mana yang lebih baik REM atau FEM)

Jika H_0 tidak ditolak (diterima), maka REM lebih baik Jika H_0 ditolak, maka FEM lebih baik

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	2.764775		3	0.4293
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
MW	-0.000001	-0.000001	0.000000	0.0997
AEL	0.090334	1.099305	0.374545	0.0992
EG	-0.126194	-0.137186	0.000060	0.1556

Appendix 3: UR, MW, AEL, and EG variables in 15 regions and cities in North Sulawesi Province from 2010 to 2022

No.	KABUPATEN	TAHUN	Tingkat Pengangguran (UR)	Tingkat Upah Minimum (MW)	Rata-rata Tingkat Pendidikan (AEL)	Pertumbuhan Ekonomi (EG)
1	Bol-Mong	2010	8.04	1000000	6.74	5.57
2	Bol-Mong	2011	5.46	1050000	6.84	2.72
3	Bol-Mong	2012	5.84	1250000	6.99	5.07
4	Bol-Mong	2013	6.23	1550000	7.03	6.67
5	Bol-Mong	2014	3.43	1900000	7.13	5.56
6	Bol-Mong	2015	5.77	2150000	7.14	5.82
7	Bol-Mong	2016	5.19	2400000	7.3	6.62
8	Bol-Mong	2017	4.88	2598000	7.38	6.67
9	Bol-Mong	2018	3.58	2824000	7.59	7.49
10	Bol-Mong	2019	4.39	3051076	7.77	7.89
11	Bol-Mong	2020	4.87	3310723	7.93	0.98
12	Bol-Mong	2021	4.85	3310723	8.03	3.87
13	Bol-Mong	2022	4.96	3310723	8.17	5.35
14	Minahasa	2010	8.4	1000000	8.89	5.92
15	Minahasa	2011	9.2	1050000	8.95	6.23
16	Minahasa	2012	6.14	1250000	9.06	6.53
17	Minahasa	2013	7.43	1550000	9.16	6.2
18	Minahasa	2014	8.8	1900000	9.53	6.39
19	Minahasa	2015	9.62	2150000	9.54	6.17
20	Minahasa	2016	7.43	2400000	9.54	6.06
21	Minahasa	2017	6.91	2598000	9.55	6.07
22	Minahasa	2018	7.35	2824000	9.56	6.1
23	Minahasa	2019	5.88	3051076	9.58	5.79
24	Minahasa	2020	6.3	3310723	9.59	-1.02
25	Minahasa	2021	6.14	3310723	9.73	3.96
26	Minahasa	2022	7	3310723	9.82	5.47
27	Sangihe	2010	11.56	1000000	7.02	5.93
28	Sangihe	2011	7.34	1050000	7.08	3.92
29	Sangihe	2012	6.19	1250000	7.13	5.56
30	Sangihe	2013	4.24	1550000	7.14	5.60
31	Sangihe	2014	5.64	1900000	7.34	5.44
32	Sangihe	2015	7.09	2150000	7.5	6.07
33	Sangihe	2016	5.63	2400000	7.7	6.08
34	Sangihe	2017	5.11	2598000	7.89	5.45
35	Sangihe	2018	3.71	2824000	7.9	5.50
36	Sangihe	2019	4.18	3051076	8.04	5.42
37	Sangihe	2020	4.91	3310723	8.29	0.47
38	Sangihe	2021	4.72	3310723	8.34	5.98
39	Sangihe	2022	2.87	3310723	8.49	5.45
40	Talaud	2010	7.88	1000000	8.48	5.58
41	Talaud	2011	7.91	1050000	8.48	3.07
42	Talaud	2012	3.47	1250000	8.5	4.96
43	Talaud	2013	1.97	1550000	8.71	5.2
44	Talaud	2014	3.32	1900000	8.73	5.18
45	Talaud	2015	2.02	2150000	8.82	5.23
46	Talaud	2016	3.25	2400000	8.92	5.28
47	Talaud	2017	3.5	2598000	8.93	5.1
48	Talaud	2018	2.23	2824000	9	5.02

49	Talaud	2019	2.81	3051076	9.25	4.69
50	Talaud	2020	2.64	3310723	9.51	0.43
51	Talaud	2021	2.3	3310723	9.72	3.34
52	Talaud	2022	3.67	3310723	9.73	5.22
53	Min-Selatan	2010	7.39	1000000	7.93	5.72
54	Min-Selatan	2011	6.13	1050000	8.03	3.83
55	Min-Selatan	2012	7.54	1250000	8.14	6.13
56	Min-Selatan	2013	6.69	1550000	8.25	6.61
57	Min-Selatan	2014	5.33	1900000	8.47	6.7
58	Min-Selatan	2015	6.85	2150000	8.7	6.3
59	Min-Selatan	2016	6.09	2400000	8.71	5.09
60	Min-Selatan	2017	7.38	2598000	8.72	6.53
61	Min-Selatan	2018	5.93	2824000	8.84	6.09
62	Min-Selatan	2019	4.23	3051076	8.85	5.97
63	Min-Selatan	2020	5.01	3310723	9.08	-0.77
64	Min-Selatan	2021	4.9	3310723	9.09	4.91
65	Min-Selatan	2022	5.77	3310723	9.19	5.41
66	Min-Utara	2010	11.18	1000000	8.76	7.26
67	Min-Utara	2011	8.98	1050000	8.97	6.82
68	Min-Utara	2012	10.82	1250000	8.99	7.12
69	Min-Utara	2013	7.27	1550000	8.99	6.91
70	Min-Utara	2014	7.35	1900000	9.07	7.5
71	Min-Utara	2015	10.08	2150000	9.23	7.03
72	Min-Utara	2016	8.33	2400000	9.24	7.05
73	Min-Utara	2017	9.48	2598000	9.32	6.51
74	Min-Utara	2018	6.72	2824000	9.61	6.41
75	Min-Utara	2019	5.01	3051076	9.93	6.35
76	Min-Utara	2020	7.88	3310723	9.99	-0.9
77	Min-Utara	2021	8.12	3310723	10	5.36
78	Min-Utara	2022	7.09	3310723	10.18	5.5
79	Bol-Utara	2010	6.83	1000000	6.85	4.8
80	Bol-Utara	2011	5.03	1050000	7.01	5.33
81	Bol-Utara	2012	5.97	1250000	7.17	6.92
82	Bol-Utara	2013	5.79	1550000	7.34	7.12
83	Bol-Utara	2014	7.9	1900000	7.51	6.81
84	Bol-Utara	2015	2.95	2150000	7.52	5.8
85	Bol-Utara	2016	5.39	2400000	7.67	6.16
86	Bol-Utara	2017	4.71	2598000	7.86	6.28
87	Bol-Utara	2018	5.08	2824000	8.11	6.18
88	Bol-Utara	2019	4.62	3051076	8.12	6.17
89	Bol-Utara	2020	5.48	3310723	8.4	0.71
90	Bol-Utara	2021	5.23	3310723	8.41	3.46
91	Bol-Utara	2022	5.1	3310723	8.57	5.52
92	Sitaro	2010	5.7	1000000	7.83	7.22
93	Sitaro	2011	4.8	1050000	7.92	7.04
94	Sitaro	2012	4.28	1250000	8.01	8.19
95	Sitaro	2013	1.71	1550000	8.09	8.02
96	Sitaro	2014	4.21	1900000	8.18	7.56
97	Sitaro	2015	6.21	2150000	8.34	7.01
98	Sitaro	2016	3.73	2400000	8.45	7.00
99	Sitaro	2017	2.68	2598000	8.56	6.99
100	Sitaro	2018	2.82	2824000	8.57	6.73
101	Sitaro	2019	2.78	3051076	8.75	6.65
102	Sitaro	2020	3.31	3310723	8.97	1.03

103	Sitaro	2021	3.39	3310723	9.03	4.43
104	Sitaro	2022	2.96	3310723	9.21	5.19
105	MinTra	2010	5.71	1000000	8.07	7.34
106	MinTra	2011	6.96	1050000	8.12	4.79
107	MinTra	2012	5.67	1250000	8.18	6.31
108	MinTra	2013	5.7	1550000	8.24	6.42
109	MinTra	2014	4.26	1900000	8.37	6.58
110	MinTra	2015	4.46	2150000	8.38	6.29
111	MinTra	2016	4.71	2400000	8.39	6.32
112	MinTra	2017	5.72	2598000	8.51	6.36
113	MinTra	2018	4.82	2824000	8.82	6.00
114	MinTra	2019	3.18	3051076	8.87	5.98
115	MinTra	2020	3.31	3310723	8.88	-0.64
116	MinTra	2021	3.39	3310723	9.11	4.29
117	MinTra	2022	3.43	3310723	9.12	5.3
118	Bol-Selatan	2010	4.41	1000000	6.79	5.56
119	Bol-Selatan	2011	8.16	1050000	6.87	5.57
120	Bol-Selatan	2012	5.95	1250000	6.96	6.96
121	Bol-Selatan	2013	7.73	1550000	7.45	7.21
122	Bol-Selatan	2014	8.72	1900000	7.68	7.47
123	Bol-Selatan	2015	6.78	2150000	7.7	5.96
124	Bol-Selatan	2016	6.03	2400000	7.71	6.13
125	Bol-Selatan	2017	6.34	2598000	7.72	6.24
126	Bol-Selatan	2018	4.54	2824000	7.73	6.56
127	Bol-Selatan	2019	4.79	3051076	7.8	6.39
128	Bol-Selatan	2020	4.39	3310723	7.9	0.63
129	Bol-Selatan	2021	4.6	3310723	8.15	3.74
130	Bol-Selatan	2022	2.75	3310723	8.16	5.2
131	Bol-Timur	2010	5.78	1000000	6.66	5.17
132	Bol-Timur	2011	6.43	1050000	6.86	5.91
133	Bol-Timur	2012	9.58	1250000	7.02	6.61
134	Bol-Timur	2013	3.75	1550000	7.17	6.7
135	Bol-Timur	2014	6.4	1900000	7.28	6.98
136	Bol-Timur	2015	7.19	2150000	7.38	6.48
137	Bol-Timur	2016	6.60	2400000	7.52	5.57
138	Bol-Timur	2017	7.32	2598000	7.53	5.71
139	Bol-Timur	2018	8.18	2824000	7.57	5.06
140	Bol-Timur	2019	6.37	3051076	7.59	4.8
141	Bol-Timur	2020	6.13	3310723	7.83	0.16
142	Bol-Timur	2021	5.99	3310723	7.93	3.05
143	Bol-Timur	2022	6.19	3310723	8.09	5.18
144	Manado	2010	13.91	1000000	10.19	6.03
145	Manado	2011	11.48	1050000	10.68	7.8
146	Manado	2012	10.85	1250000	10.74	7.11
147	Manado	2013	8.78	1550000	10.8	7.16
148	Manado	2014	9.59	1900000	11.01	6.69
149	Manado	2015	14.28	2150000	11.02	6.39
150	Manado	2016	11.33	2400000	11.02	7.18
151	Manado	2017	9.35	2598000	11.03	6.74
152	Manado	2018	10.38	2824000	11.04	6.65
153	Manado	2019	10.46	3051076	11.26	6.05
154	Manado	2020	13.88	3310723	11.27	-3.16
155	Manado	2021	12.17	3310723	11.42	5.15
156	Manado	2022	10.47	3310723	11.43	5.64

157	Bitung	2010	12.23	1000000	8.84	4.97
158	Bitung	2011	11.3	1050000	8.93	5.87
159	Bitung	2012	7.72	1250000	9.03	6.45
160	Bitung	2013	10.61	1550000	9.15	6.66
161	Bitung	2014	13.18	1900000	9.26	6.39
162	Bitung	2015	11.87	2150000	9.28	3.54
163	Bitung	2016	10.72	2400000	9.37	5.21
164	Bitung	2017	9.85	2598000	9.64	6.18
165	Bitung	2018	11.21	2824000	9.65	6.01
166	Bitung	2019	9.8	3051076	9.87	4.06
167	Bitung	2020	10.23	3310723	9.88	1.37
168	Bitung	2021	9.96	3310723	9.89	4.6
169	Bitung	2022	8.56	3310723	9.91	5.61
170	Tomohon	2010	9.86	1000000	9.44	5.48
171	Tomohon	2011	8.79	1050000	9.66	6.8
172	Tomohon	2012	8.68	1250000	9.83	6.93
173	Tomohon	2013	5.73	1550000	10	6.1
174	Tomohon	2014	7.84	1900000	10.2	6.22
175	Tomohon	2015	10.94	2150000	10.22	6.13
176	Tomohon	2016	8.55	2400000	10.23	4.1
177	Tomohon	2017	8.94	2598000	10.24	8.84
178	Tomohon	2018	8.22	2824000	10.25	6.12
179	Tomohon	2019	7.75	3051076	10.48	6.76
180	Tomohon	2020	8.99	3310723	10.1	-0.41
181	Tomohon	2021	8.84	3310723	10.74	1.95
182	Tomohon	2022	8.11	3310723	10.75	5.17
183	Kotamobagu	2010	7.58	1000000	8.9	6.84
184	Kotamobagu	2011	10.05	1050000	9.11	6.49
185	Kotamobagu	2012	9.42	1250000	9.32	6.96
186	Kotamobagu	2013	5.31	1550000	9.56	7.06
187	Kotamobagu	2014	9.02	1900000	9.75	6.7
188	Kotamobagu	2015	10.17	2150000	9.75	6.52
189	Kotamobagu	2016	7.51	2400000	9.97	6.63
190	Kotamobagu	2017	5.71	2598000	9.98	6.79
191	Kotamobagu	2018	5.73	2824000	10.04	6.66
192	Kotamobagu	2019	5.82	3051076	10.09	6.13
193	Kotamobagu	2020	7.44	3310723	10.1	0.19
194	Kotamobagu	2021	7.32	3310723	10.31	4.22
195	Kotamobagu	2022	6.59	3310723	10.32	5.15