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Relative Poverty and Inequality of Income Distribution in Indonesia Using Granger Causality Approach

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Abstract

This research is a development of the theory of poverty, this study descriptively analyzes relative poverty and income distribution inequality and examines the causal relationship between relative poverty and income inequality in all provinces in Indonesia by using the Granger causality test analysis tool. Based on the results of the causality test, it shows that there is a unidirectional relationship between relative poverty and income distribution inequality, where it is the inequality of income distribution that causes relative poverty

Keywords: Relative Poverty and Inequality of Income Distribution

INTRODUCTION

The problem of poverty and inequality is a macroeconomic problem that is often faced by various countries in the world, including Indonesia. The development of inequality in Indonesia based on data from the Central Statistics Agency (BPS) is still in an uneven condition, when viewed from the Gini index, the inequality of income distribution in Indonesia has not shown a number that is close to zero or evenly distributed, according to BPS data in 2019 inequality with a Gini index of 0.380 and increased to 0.383 in 2020.

Referring to BPS data in March 2018, the poverty rate in Indonesia is 9.82 %, or only 25.95 million Indonesians are categorized as poor. In the history of government in Indonesia, starting from the old order era to the present, the poverty rate for the first time in history is below 10%. Poverty and inequality are closely related, in the view of social democracy (Cheyne, Obrien, and Belgrave 1998). and inequality in society is what causes poverty. When the focus of attention is only on the economic dimension, but does not pay attention to aspects of social democracy, poverty alleviation will be difficult to run well, because the population or society must have rights and participation in addition to fulfilling a decent standard of living.

In the view of social democracy (Cheyne, Obrien, and Belgrave 1998), it is injustice and inequality in society that causes poverty. The measure of poverty is not only the ability to meet the minimum living needs, but if it is measured by the unequal distribution of income, income inequality will appear greater than absolute poverty. From the phenomena above, there is a relationship between poverty and inequality that needs to be studied in depth. Some of the previous studies include: Hariani (2019) in his research, found that only the HDI variable had a significant effect on income inequality. Meanwhile, the variables of the open unemployment rate (TPT) and the district/city minimum wage (UMK) have no significant effect on income inequality. The advantage of this research lies in the use of a panel data model with provinces that have a dense population. While the weaknesses of this study include , the independent

variables used are only three variables and only one is significant, and the object only focuses on inequality and does not relate to poverty and focuses on only one province and does not relate to poverty. Olofin et al (2015) in their research, found that political terror reduces poverty significantly at the level when real/capita income is used for poverty. Then, democracy was noted to reduce poverty with statistically significant results, while population increase and poverty were positively associated with statistically significant results. Sumner (2014), in his research on how poverty and inequality in Indonesia in the future by analyzing descriptive statistics and trends, shows that Indonesia has the potential to earn higher incomes than the international poverty line with the assumption that income distribution is even if using the line. international poverty, the number of poor people in urban areas is higher than the rural population. Guiga & Rejeb (2012), examines the relationship between poverty, inequality, and growth using a simultaneous equation model of panel data. The results show that state investment in social sectors such as education and health and improving the living conditions of the rural population can promote growth and reduce economic inequality. Therefore, the Kuznets hypothesis based on the relationship between economic growth and income inequality is the most appropriate. Ananda & Pulungan (2019) in their research, found that by using panel data regression, economic growth, inflation, and the unemployment rate had a positive and significant effect on inequality while the credit sector *share* had a significant negative effect, only total expenditure was not significant. In Shamsuddin's research (2018), regarding the relationship between growth, poverty, and inequality using *Linear programming* and Panel *random effects* , it is found that the impact of survey income per capita and some inequality on poverty measures is 'linear' when controlling for non-linear growth components, but , if this assumption is relaxed, this study does not establish either a 'U' shape of the 'relationship' and/or 'asymptotic' curve between the variables. Dartanto and Otsubo 2013 , in their research using the 2005 National Socio-Economic Survey (Susenas), the result is that there are differences between absolute and subjective and relative poverty measurements. And the result is almost no relationship between poverty rankings in the provinces in Indonesia obtained by five poverty metrics. The results of the logit model and the ordered logit model estimation of the possible determinants of poverty show that the main determinants of poverty are educational attainment, number of household members, physical assets (land and house ownership), the presence of migrant workers (possibility of remittances), negative shocks to layoffs and/or or health problems, the development of public services, and the availability of road infrastructure.

RESEARCH METHODS

The type of data used in this study based on the method of obtaining it is secondary data, which consists of *time series data from* 2014 to 2020 using objects from 34 provinces in Indonesia, while the source of the data obtained comes from the Central Statistics Agency (BPS).).

Data analysis method used is quantitative descriptive method, with analytical techniques used in accordance with the order in answering the formulation of the problem.

a. To answer the first problem, the analytical tool used is descriptive statistics by describing the conditions of inequality and relative poverty, calculating relative poverty based on Dartanto's (2013) approach and analyzing the data descriptively.
b. To answer the second problem, using the Granger causality test analysis tool (Granger 1969) as follows:
   $Yt = ai\ Yt\text{-}i$ + bj Xt $\text{-}j$ + t *(3.1)*
   $Xt = ci\ Xt\text{-}i$ + dj $Yt\text{-}j$ + t (*3.2)*

Y = Poverty

2) X = Inequality (Gini Index)

RESULTS AND DISCUSSION

Relative Poverty

Based on the analysis that has been carried out using micro data from the National Socio-Economic Survey (SUSENAS), from BPS with the above method using the excel program, the results of the relative poverty rate are shown in table 3.1 as follows:

Table 1. Relative Poverty Rate in Indonesia

Province	2014	2015	2016	2017	2018	2019	2020	Average
Aceh	17.17	18.54	19.54	20.63	18.5	18.13	16.9	18.46
North Sumatra	11.31	13.38	14.53	12.1	12.38	11.33	10.4	12.20
West Sumatra	17.37	18.51	17.49	15.85	14.47	13.64	13.46	15.82
Riau	19.02	19.26	20.48	16.54	15.27	16.57	14.68	17.40
Jambi	19.47	20.28	20.21	13.53	17.04	15.76	16.04	17.47
South Sumatra	23.71	19.51	23.99	21.34	20.04	18.52	18.84	20.85
Bengkulu	19.79	20.89	22.03	18.88	18.55	15.68	14.37	18.59
Lampung	16.29	21.13	21.77	19.41	19.52	17.97	16.59	18.95
Kep. bangka belitung	12.46	11.91	11.14	9.41	9.35	7.72	5.48	9.63
Kep. riau	20.71	17.87	15.8	15.04	13.01	12.38	12.11	15.27
DKI Jakarta	31.55	33.47	32.03	34.05	31.58	27.48	27.85	31.14
West Java	30.26	32.24	32.84	30.74	29.91	29.32	29.17	30.64
Central Java	27.37	26.17	27.38	25.91	26.63	24.39	24.76	26.08
In Yogyakarta	26.22	32.48	34.83	35.18	33.43	30.02	31.37	31.93
East Java	24.81	32.83	31.99	281	25.11	21.76	22.57	26.72
Banten	28.56	30.35	30.63	28.6	26.84	23.4	22.45	27.26
Bali	30.22	22.74	22.22	23.39	22.86	20.95	20.5	23.26
West Nusa Tenggara	31.47	24.93	32.48	29.88	28.48	30.48	29.18	29.55
East Nusa Tenggara	15.3	16.75	17.22	20.45	19.98	20.17	20.38	18.60
West Kalimantan	26.07	17.56	18.45	17.83	16.63	16.39	16.42	18.47
Central Kalimantan	24.1	20.25	21.58	21.01	20.32	20.54	16.04	20.54
South Borneo	18.17	19.79	20.09	19.47	17.13	15.09	16.38	18.01
East Kalimantan	19.97	16.21	15.55	17.78	18.71	17.47	14.49	17.16
North Kalimantan	0	14.27	13.89	13.39	12.68	10.84	12.01	11.01
North Sulawesi	32.23	22.18	28.59	27.6	27.07	22.68	23.62	26.28
Central Sulawesi	19.7	19.03	19.4	19.74	17.04	15.48	14.18	17.79
South Sulawesi	33.2	30.17	31.45	28.25	27.01	24.45	25.92	28.63
Southeast Sulawesi	29.92	27.41	32.7	29	28.71	23.3	22.47	27.64
Gorontalo	39.18	31.56	34.4	33.14	31.13	30.42	29.18	32.71
West Sulawesi	19.02	24.54	24.5	22.4	21.88	22.57	22.77	22.52
Maluku	15.05	13.93	14.95	14.32	15.14	11.57	11.33	13.75
North Maluku	15.53	15.66	12.55	12.5	13.83	11.7	13.22	13.57
Papua	28.4	26.48	25.72	26.26	23.6	21.34	19.97	24.53
West Papua	27.2	26.54	31.27	29.84	27.39	27.06	26.23	27.93
Indonesia	**25.11**	**26.24**	**27**	**25.12**	**24.09**	**22.32**	**22.19**	**24.58**

Source: BPS (processed SUSENAS micro data)

Causality Relationship of Relative Poverty and Income Distribution
Determining the Best Lag in the Granger Causality Test

To perform the Granger causality test, a lag is used to obtain the best test, the best lag is the one that obtains the smallest Akaike Info Criterion (AIC) value from several regression results with the dependent variable being relative poverty and the independent variables being relative poverty and inequality using lags 1,2 and 3, For this purpose, a one-on-one test is carried out, namely:

Using Lag 2

Results of Lag 2 Regression Granger Causality Test

Variable	**Coefficient**	**Std. Error**	**-Statistics**	**Prob.**
C	5.718254	3.052993	1.872999	0.0623
KT(-1)	-4.892161	12.34001	-0.396447	0.6921
KR(-1)	0.816959	0.080602	10.13571	0.0000
R-squared	0.622951	Mean dependent var		1.50456
usted R-squared	0.619729	SD dependent var		.853251
E of regression	4.226135	Akaike info criterion		.733030
n squared resid	4179.292	Schwarz criterion		.776930
kelihood logs	-676.3641	Hannan-Quinn Criter.		.750725
F-statistics	193.3048	Durbin-Watson stat		.237385
ob(F-statistic)	0.000000			

Source : BPS data processed with *Eviews 9.0*

Based on the results of the regression table 3.2 The results of the regression using the second lag can be compared with the AIC value, which uses lag one or the first lag, an AIC value of 5.73 is obtained.

Using Lag 3

Results of Lag 3 Regression Granger Causality Test

Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	0.076541	3.806774	0.020106	0.9840
KT(-1)	-6.866226	12.67040	-0.541911	0.5884
KT(-2)	22.83930	12.57519	1.816219	0.0706
KR(-1)	0.710532	0.101838	6.977054	0.0000
KR(-2)	0.021575	0.099020	0.217885	0.8277
R-squared	0.637020	Mean dependent var		21.51712
Adjusted R-squared	0.630734	SD dependent var		6.865082
SE of regression	4.171721	Akaike info criterion		5.715493
Sum squared resid	4020.152	Schwarz criterion		5.788879
Likelihood logs	-669.4282	Hannan-Quinn Criter.		5.745076
F-statistics	101.3495	Durbin-Watson stat		2.024077
Prob(F-statistic)	0.000000			

Source : BPS Data processed with *Eviews 9.0*

Based on the results of the regression in table 5.3, which using the second lag or adding one more lag, from the previous lag the AIC value is 5.71, when compared to the AIC value in the first lag, this result shows a lower AIC value. However, to make sure to use the second lag which has a lower AIC value, it is necessary to test again by adding another lag, namely the third lag.

Using Lag 4

Results of Lag 4 Regression Granger Causality Test

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-2.387697	4.385453	-0.544458	0.5867
KT(-1)	-7.821067	12.77074	-0.612421	0.5409
KT(-2)	20.15867	13.03194	1.546866	0.1233
KT(-3)	13.81832	12.75498	1.083367	0.2798
KR(-1)	0.704354	0.103064	6.834135	0.0000
KR(-2)	0.030561	0.114683	0.266479	0.7901
KR(-3)	-0.057845	0.099777	-0.579741	0.5627
R-squared	0.638983	Mean dependent var		21.52553
Adjusted R-squared	0.629482	SD dependent var		6.878516
SE of regression	4.186965	Akaike info criterion		5.731164
Sum squared resid	3996,994	Schwarz criterion		5.834215
Likelihood logs	-666.4117	Hannan-Quinn Criter.		5.772709
F-statistics	67.25811	Durbin-Watson stat		2.012321
Prob(F-statistic)	0.000000			

Source : BPS Data processed with *Eviews 9.0*

Based on the results of the regression in table 5.4, it was obtained that the AIC value of 5.73 this AIC value turned out to be the same as the AIC value in the regression test using lag one, the second result was good for lag one and the third lag the AIC was higher when compared to using the second lag. So the conclusion is based on regression testing using lags 1, 2 and 3, the smallest AIC value was obtained at lag 2, namely 5.71 so that to perform the Granger lag causality test the best selected was lag 2.

Granger Causality Test Results

In the Granger causality test there are four possibilities that will occur , namely:

1. Poverty affects inequality, but inequality does not affect poverty (unidirectional)
2. Inequality affects poverty, but poverty does not affect inequality (unidirectional)
3. Poverty affects inequality and inequality affects poverty (both directions)
4. Poverty does not affect inequality and inequality does not affect poverty (No relationship at all)

After getting the best lag, namely lag 2, a Granger causality test is carried out with the following results:

Table 2.Granger Causality Test Results Between Relative Poverty and Inequality of Income Distribution

Null Hypothesis:	Obs	F-Statistics	Prob.
KT does not Granger Cause KR	236	1.65395	0.1936
KR does not Granger Cause KT		6.01001	0.0029

Source : BPS data processed with Eviews 9.0

Based on the results of the Granger causality test in table 5.5 above, it can be seen that relative poverty (KR) does not cause inequality (KT), because the probability value is 0.19

which is smaller than the alpha significance of 5% (0.05), on the other hand inequality causes relative poverty. This can be seen in the probability value of 0.0029 or 0.29% which is small from the significance of alpha 5% (0.05) and alpha 1% (0.01). Thus , there is only a unidirectional relationship between relative poverty and inequality in income distribution, where inequality in income distribution causes relative poverty, but relative poverty does not cause inequality in income distribution.

The results of the causality test show that there is a unidirectional relationship between relative poverty and inequality in income distribution. In this case it is the inequality of income distribution that causes relative poverty , this is very much in line with the statement in another view of social democracy (Cheyne, Obrien and Belgrave 1998) which states that injustice and inequality in society will lead to poverty.

The concept of relative poverty calculated by Dartanto (2013) calculates relative poverty by using per capita income whose approach uses per capita expenditure data to obtain the average expenditure. From the average expenditure data, half or fifty percent of the expenditure is taken as the poverty line so that if the population whose expenditure is below the poverty line is categorized as poor.

From the calculation process, it can be related to the results of causality, namely the more inequality in per capita expenditure from the average population expenditure, the higher the relative poverty level that appears so that if the number of people with a lot of per capita expenditure is below an average even below half of the average used as the poverty line will lead to a higher relative poverty rate. This identifies that it is the inequality of income distribution that causes relative poverty, according to the concept of poverty put forward by BPS which states that relative poverty is caused by the inequality of income distribution between residents, which is caused by unequal economic development policies.

The results of this study using the concept of causality, further strengthen the concept of the definition of relative poverty put forward by BPS that relative poverty is caused by inequality in income distribution and supports the theory or opinion of the social democratic view (Cheyne, Obrien and Belgrave 1998) which states injustice and inequality in a society that will lead to poverty.

CONCLUSION

a. The relative poverty rate in Indonesia is still high compared to the absolute poverty level. From all provinces in Indonesia, it can be seen that on average the province with the lowest relative poverty rate is Bangka Belitung Islands Province, while the province with the highest relative poverty rate is Bangka Belitung Province. Gorontalo.

b. Based on the causality test , it shows that there is a unidirectional relationship between relative poverty and inequality in income distribution. In this case, it is the inequality of income distribution that causes relative poverty.

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