

Determinant Analysis Of Household Income Inequality And Poverty In Indonesia

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Abstract: Inequality and poverty problems in Indonesia continue to be the main government's target to realize the welfare of society, high income inequality can affect the low purchasing power of society and causing poverty. Purchasing power is influenced by nonmonetary factors such as fuel prices and basic electricity tariffs. The purpose of this article is to examine the effects of the fuel prices increase and the basic electricity tariffs on the household income inequality and poverty in Indonesia, both in short and long term. The analysis model used in this study refers to the basic model of multiple linear regression equation with ECM method in estimating short-term and long-term relationship. Result obtained is whether in short-term or long term, variable that used in this study significantly influence the household inequality and poverty in Indonesia.

Index Terms: Basic electricity tariffs, fuel oil, income inequality, poverty.

1. INTRODUCTION

The high inequality will be a barrier to prosperity, the growth of quality institutions, and the development of high quality education [1]. The income distribution inequality is closely related to poverty. Poverty is a problem faced by all countries in the world. Adam Smith and Marx argue that the main issue of the distribution of income is how the product proceeds are divided, including wages, rent and profits [2]. As a result of the income inequality, especially consumer households will affect the purchasing power and increasing poverty in a country. The income inequality can occur substantially from inequality

in some other 'spaces', ie in the case of other relevant variables, such as welfare, freedom and different aspects of quality of life [3]. These problems show that economic growth does not parallel automatically with the expansion of employment and the decline in poverty. Thus, economic policy must be redesigned to support growth, vacancies, and the poor [4]. Inequality problems in Indonesia continues to be the main target of government to realize the welfare of community, judging from the gini ratio, the inequality of Indonesia in the last 6 years shows an increasing trend, can be seen in graph 1 below:

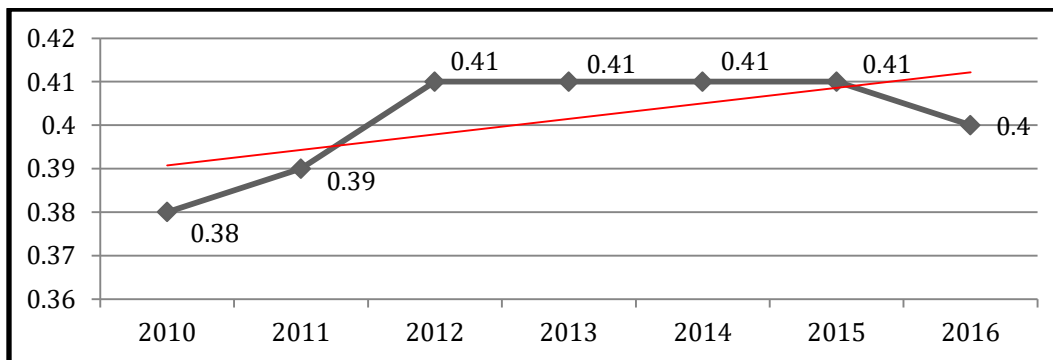


Fig. 1. Gini Ratio Trend

From figure 1 above, it can be seen that the income inequality in Indonesia is still in the "moderate" category and should be highly noticed by the government to achieve the development goals. A World Bank report released in December 2015 claimed that only 20 percent of Indonesia's wealthiest people who have enjoyed economic growth, implying that 80 percent of the population (or 200 million people in absolute terms) are left behind (Indonesian Investment). The condition of poverty

in Indonesia in 2010-2016 can be seen in figure 2. From Figure 2 it can be seen that the condition of poverty in Indonesia has started to decline from 2010 until 2016. One of the indicators commonly used when looking at the welfare of a community is by looking at the human development index [5]. Human significance in the development of human is seen as the subject of development which means that development is intended for the benefit of human or society [6].

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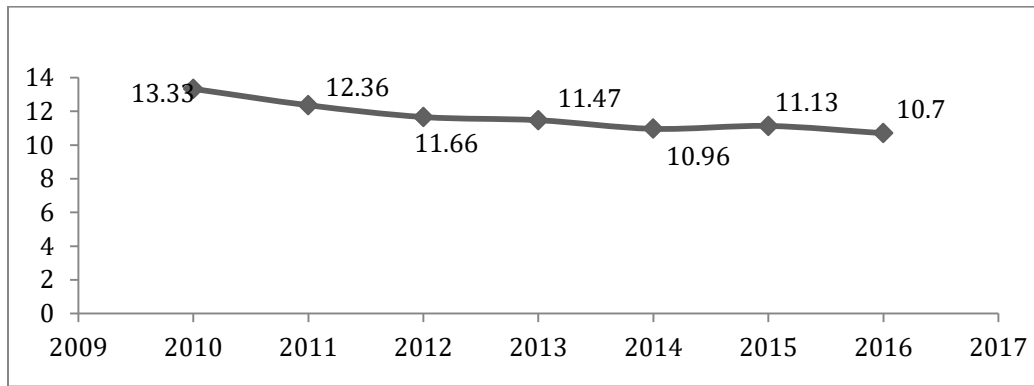


Fig. 2. Trend of Poverty Rate From 2010-2016

In 2010 Human Development Report (HDR) introduced Inequality-adjusted Human Development Index (IHDI), which takes into account the inequality of the three dimensions of human development index by ignoring the average value of each dimension according to the level of inequality [7]. Human development inequalities still occur, both nationally and

regionally. The condition of human development in Indonesia continues to progress marked by the increasing of Human Development Index (HDI) from 2010-2015. By 2015, Indonesia's HDI has reached 0.689, this puts Indonesia in the middle human development category. Can be seen in Figure 3.

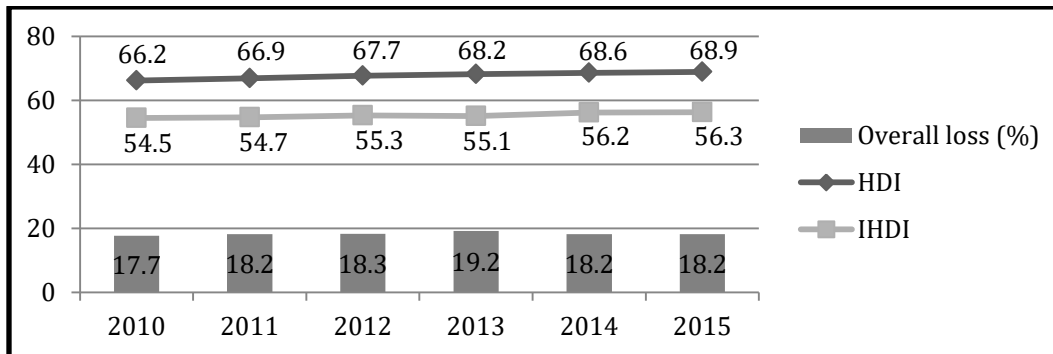


Fig. 3. Trend of HDI and IHDI From 2010-2015

The HDI improvement reflects the progress Indonesia has made in terms of life expectancy at birth, average school year, long-term schooling and Gross National Income (GNI) per capita during that period. Nevertheless, by 2015 the inequality in human development in Indonesia is greater than the previous year from the Inequality-adjusted Human Development Index (IHDI) of 0.563 [8]. One of dimensions used in measuring IHDI is a decent standard of living, seen from the purchasing power of society. This purchasing power is influenced by non-monetary factors such as fuel prices, Basic Electricity Tariffs and so on. The rising of fuel prices and Basic Electricity Tariffs can lead to increasing the prices of goods and services (inflation) that affects the decline in purchasing power, especially to the lower classes society. Explained that the implementation of contraction of fiscal policy by reducing fuel subsidy is due to lower cash deficit caused by large subsidy and followed by increasing CPO (Crude Palm Oil) price. Therefore, with the subsidy abolition or reduction and followed by the rise of fuel prices, it can reduce

the purchasing power of the people that will impact the income inequality and increase poverty [4]. The highest consumption expenditure other than food comes from sub-groups of housing and household facilities such as electricity expenditure, and fuel expenditure. In addition, lease expenditures also increased in the previous year due to the prices rise of each subgroup of housing and household facilities. In March 2017, nationally per capita monthly expenditure on electricity became one of the top three expenditures in the sub-group of housing and household facilities, amounting to IDR 25,623. When compared to March 2016 expenses of IDR 25,311, an increase of 1.23 percent to IDR 25,623 in March 2017 [9].

2 LITERATURE REVIEW

Welfare is a function of resources and the ability to transform it into achievement, or function. This approach has certain implications in the case of inequality. Inequality refers to "differences, variations and different differences" in individual and group characteristics [10]. Inequality adds a moral

dimension that refers to a subset of inequalities that are considered unfair [11]. Injustice and inequality are an integral part of the capability approach because of their relation to distributive justice. As noted in HDR 2011, Inequality in outcomes is largely the result of unequal access to capability

[8]. If people in a society have the same ability, we certainly would not expect the same results because people have different preferences and values. But we can be confident that these results arise because of differences in people's choices rather than barriers to their ability to use their choices [12]. Inequality is another issue that is often associated with poverty. The close relationship between inequality and poverty is that the inequality is part of poverty. Views the relationship between inequality and poverty as a pragmatic relationship, namely that the inequality causes more severe poverty or inequality is a form of poverty [13]. Stated that there is a positive relationship between poverty and inequality, both spatial and inter-personal [14]. Income inequality is a relative inequality of income between groups of people as measured by Gini Ratio. The imbalance of income distribution, decline in welfare, and poverty attracted the attention of various parties, such as policymakers, politicians, social and economic researchers, and the wider community [15].

2.1 Income Inequality Theory

Gini index can be used to measure the distribution of income, consumption, or other types of disruption [16]. The gini index is a coefficient of the income inequality distribution in a given state by calculating the area between the diagonal line and the Lorenz curve compared to the total area of the square half in which the Lorenz curve exists. Gini Ratio is calculated using formula [17].

$$GR = 1 - \sum_{i=1}^k (f_i - f_{i-1})(y_i + y_{i-1}) \quad (1)$$

Where, k: number of classes / groups, f_i : proportion of cumulative number of i th grade households, y_i the proportion of the cumulative number of household incomes of the i th grade.

TABLE 1

INDICATOR OF GINI RATIO INEQUALITY	
Value of Gini Ratio	Inequality Level
< 0,35	Low
0,35-0,5	Moderate
>0,5	High

One way to showing income distribution is to use Lorenz curve. The Lorenz curve analysis aims to show the degree of inequality in income distribution [9]. The Lorenz curve illustrates the cumulative distribution of national income among the cumulative layers of the population. With an equal income distribution condition, X percent of the population will Receive X percent of total revenue. In the Lorenz curve, this situation is described as a diagonal line from the lower left to the top right (OQ) [9].



Fig. 4. Degree of Equality / Diversity by Lorenz Curve

2.2 Inequality-adjusted Human Development Index (IHD)

One way to reduce inequality in society is to encourage economic growth and the development of middleclass society [9]. Since then, some authors have called for inequalities to be incorporated into HDI more substantively [18]. IHD takes into account not only the average achievement of a country on health, education and income, but also how these achievements are distributed among the population by "ignoring" the average value of each dimension according to the level of inequality [7].

2.3 Poverty

Economic problems such as poverty and inequality are found in all contemporary societies, although they are more visible and manifest in some societies than in other countries. Poverty can be said to be the most widespread and serious problem that faced the modern world conditions such as hunger, homelessness, preventable diseases, unemployment, and illiteracy as an element of poverty [19]. There is a widespread assumption that poverty and inequality are two sides of the same coin [20]. The evolution of the concept of poverty reflects changes in the theory and practice of development in general, and the analysis of causes of poverty in particular. As a result, measures of measurement, description and poverty analysis have been widespread [21].

2.4 Relation of Fuel Price Increases and Basic Electricity Tariff Toward Household Income Inequality and Poverty

The rise of fuel prices, suspected to increase the rate of inflation that will raise also Basic Electricity Tariff, which ultimately reduce the purchasing power of the people and increase the level of poverty. The plan to increase fuel prices will create an expected inflation that is the rate of inflation that occurs before the fuel price is raised, this is in accordance with the theory of inflation, ie the purchasing power of community will decrease and as well the welfare levels due to the increase in general prices of goods with the assumption of fixed income level. Inequality has long been an important issue in academics and government. Electricity and fuel are inputs in the production and goods that very much provide multiplier effect on other goods price. An increase in electricity tariffs and fuel prices can lead the increase of production costs, rising prices of other goods, inflation, increasing public spending, reducing people's purchasing power and ultimately forming a conical cycle in the economy. Increasing the amount of public spending will reduce purchasing power and ultimately reduce consumption, and widening the community inequality [9]

3 METHODOLOGY

The analytical model used in this study refers to the basic model of multiple linear regression equation with Error Correction Model method in estimating short-term and long-term relationship between variable fuel prices, and basic electricity tariff (TDL) with household income inequality in Indonesia. The error correction model (ECM) was introduced by Sargan, developed by Hendry, and popularized by Engle-Granger. Error Correction Model (ECM) is a model used to correct the regression equation among variables that are not stationary to return to their equilibrium value in the long run. After the Engle-Granger ECM model emerged, then many ECM models have been developed by econometric experts, one of which is the Domowitz-El Badawi model. This model is based on the fact that the economy is in a state of imbalance [22]. This model in this research is ECM Engle-Granger model, while the models in this research are arranged as follows:

Model 1

$$\Delta Ine_t = w_0 + w_1 \Delta BBM_t + w_2 TDL_t + w_3 EC_{t-1} + \epsilon_t \quad (2)$$

Exp:

Ine_t : Household income inequality of year t; BBMt : Fuel price of year t; TDL_t : Basic Electricity Tariff of year t; EC_{t-1} = Previous year error correction variable; ϵ_t : Interference variable, $w_{0,1,2,3}$ = Regression Coefficient.

Model 2

$$\Delta Peverty_t = w_0 + w_1 \Delta BBM_t + w_2 TDL_t + w_3 EC_{t-1} + \epsilon_t \quad (3)$$

Exp:

Poverty_t : Poverty of year t; BBMt : Fuel price of year t; TDL_t : Basic Electricity Tariff of year t; EC_{t-1} = Previous year error correction variable; ϵ_t : Interference variable.

According to this model, the ECM model is valid if the error correction coefficient mark is negative and statistically significant.

4 RESULTS

4.1 Unit Root Test

Before estimating the ECM model, it is necessary to see whether the variables used are stationary or not. If the data is not stationary it will be obtained a spurious regression, the test to see whether the data has stationary is unit root test. The use of this test is very important to detect the roots of the units in this model [23]. The existence of the root problem unit can be seen by comparing the t-statistics value of the regression with the test value of Augmented Dickey Fuller or by looking at the probability.

TABLE 2

Assessment of Unit Root Model 1 with Augmented Dickey Fuller Method on Level

Variabel	t-Statistic	Prob*	Result
Income Inequality	-1.836186	0.3495	Insignificant on $\alpha=5\%$
LnHBBM	-2.067262	0.2586	Insignificant on $\alpha=5\%$
LnTDL	-1.870796	0.3339	Insignificant on $\alpha=5\%$

TABLE 3

Assessment of Unit Root Model 2 with Augmented Dickey Fuller Method on Level

Variabel	t-Statistic	Prob*	Result
Poverty	-0.018758	0.9412	Insignificant on $\alpha=5\%$
LnHBBM	-2.067262	0.2586	Insignificant on $\alpha=5\%$
LnTDL	-1.870796	0.3339	Insignificant on $\alpha=5\%$

Based on the calculation of the two models with Augmented Dickey Fuller test method at the level tier obtained that model 1 probability value in all variable is greater than Significant value at $\alpha = 5\%$, so there is no stationary variable at the level of base level tier or still have root unit problem. Then model 2 has no stationary variable at the level tier as well.

4.2 Integration Degree Test

If the data is unstationary at the next level test is the degree of integration test, it is a test conducted to measure at different level to how much data all stationary variables. The method used is Augmented Dickey Fuller method by comparing the ADF value with absolute critical value of ADF $\alpha = 5\%$ or by comparing probability value with significant $\alpha = 5\%$ (0,05).

TABLE 4

Value of Integration Degrees Test Model 1 At Difference Level

Variabel	Integration Degree Test			
	Level		1st Difference	
	ADF	Prob	ADF	Prob
Ineq. Income	-1.870796	0.3339	-3.365116	0.0349
LH_BBM	-1.836186	0.3495	-3.888150	0.0134
LTDL	-2.067262	0.2586	-6.105948	0.0004

TABLE 5
Value of Integration Degrees Test Model 2 At Difference Level

Variabel	Integration Degree Test			
	Level		1st Difference	
	ADF	Prob	ADF	Prob
Lkemiskinan	-0.018758	0.9412	-4.991444	0.0021
LH_BBM	-1.836186	0.3495	-3.888150	0.0134
LTDL	-2.067262	0.2586	-6.105948	0.0004

In table 6 and table 7, it is known that the above integration degree test results are stationary at the 1st Difference level. Therefore, the next step is to identify whether the data is

cointegrated. Therefore we need to do cointegration test.

4.3 Cointegration Test

TABLE 6
Cointegration Test Result

Model	Variabel	t-Statistic	Prob
1	ECT	-3.858.949	0.0130
2		-3.669088	0.0211

From test results above, it can be seen that both models of stationary analysis at the level level, which has Prob value below 0.05 (<0.05). Both analyzes can be concluded that data

cointegrated or in another word there is a balance in the long term.

4.4 Error Correction Model

Model 1				
$D(Ineq_t) = w_0 + w_1 DlogBBM_t + w_2 DlogTDL_t + ECT(-1) + \epsilon_t$				
Dependent Variable: D(Ineq)				
Method: Least Squares				
Variabel	Coefficient	Prob.	R-squared	Prob(F-statistic)
C	0.004888	0.7763	0.694648	0.006202
D(logBBM)	0.132397	0.0075		
D(logTDL)	-0.025924	0.8944		
ECT (-1)	-0.491455	0.0456		
Model 2				
$D(LogPoverty_t) = w_0 + w_1 DlnBBM_t + w_2 D(TDL_t) + ECT(-1) + \epsilon_t$				
Dependent Variable: D(LogPoverty)				
Method: Least Squares				
Variabel	Coefficient	Prob.	R-squared	Prob(F-statistic)
C	0.0860140	0.7763	0.928661	0.000005
D(lnBBM)	-1.460.583	0.0154		
D(TDL)	-0.001038	0.0009		
ECT (-1)	- 0.667492	0.0167		

Model 1

$$D(Ineq_t) = 0.004888 + 0.132397DlogBBM - 0.025924DlogTDL - 0.491455ECT(-1) \quad (4)$$

Model 2

$$DlogPoverty = 0.0860140 - 1460583D(\ln BBM_t) - 0.001038D(TDL_t) - 0.667492ECT(-1) \quad (5)$$

Based on the estimation result using Error Correction Model method, it is obtained by ECT (Error Correction Term) value with negative and significant sign at $\alpha = 5\%$ then the model is valid to use. Because the error correction model is declared valid if the ECT value obtained is significant and is marked negatif [24]. The ECM Model 1 estimation results above shows that in the short and long term the variables used in this study significantly influence the household income inequality. With R2 value of about 0.694 or 69.4% can be said that the type of independent variable included in the model is good enough, because only 30.6% of the variability of the dependent variable that is influenced by independent variables outside the model. While in the estimation of ECM model 2 can be seen that in the short and long term variables used in this study have a significant effect toward Poverty. With R2 value of about 0.928 or 92.8% it can be said that the independent variable included in the model is very good, because only 7.2% of the dependent variable variability is influenced by independent variables outside the model. From estimates illustrate above that in the short term the change in fuel prices has a positive effect on the income inequality while Basic Electricity Tariff has a negative effect on the income inequality in model 1. While the short-term estimates for model 2 changes in fuel prices and Basic Electricity Tariff (TDL) has a negative effect on poverty. Finally, based on these short-term equations using the ECM method produces ECT coefficients. This coefficient measures the regressand response of each period deviating from equilibrium. The correlation coefficient of ECT imbalance in the form of absolute value explains how fast time is needed to get the equilibrium value. ECT coefficient value of 0.4914 has a meaning that the difference between the income gap with the balance value of 49.14 percent which will be adjusted within 1 year.

5 CONCLUSION

This study focuses on the analysis of factors affecting the inequality of household income and poverty in increasing human development in Indonesia with period of 2002 to 2016. In this research will be seen the short-term and long-term influence between the fuel price and basic electricity tariff toward the inequality in household income and poverty in Indonesia. 1) From the results of Error Correction Model (ECM) analysis on the results of estimation using Error Correction Model method obtained ECT (Error Correction Term) value with negative and significant sign at $\alpha = 5\%$ then the model is valid for use. Since the error correction model is valid if the ECT value obtained is significant and negatively marked, in model 1 the value of R2 is about 0.694 or 69.4% can be said that the type of free variable included in the model is good enough, because only 30.6% diversity of dependent variables influenced by independent variables outside the model and it can be said that in the short and long term the variables used in this study significantly influence the household income inequality. Then, on ECM estimation of model 2 it can be seen that in the short and long run the variables used in this study have a significant effect on Poverty. With R2 value of about 0.928 or 92.8% it can be said that the free variable type included in the model is very good, because only 7.2% of the dependent variable variability is influenced by independent variables outside the model. The statistical test in model 1 found there is a significant influence

between the fuel price toward household income inequality and the high or low Electricity Basic Tariff did not affect the household income gap, this test was obtained from t test. Then from the test results simultaneously obtained there is a significant influence simultaneously between the independent variables (fuel prices and Basic Electricity Tariff) toward dependent variable (income inequality). Then, 4) The statistical test in model 2 was found to have a significant influence between the fuel price towards poverty and there is a significant influence between Basic Electricity Tariff towards poverty, which is obtained in t test. Then from the test results simultaneously obtained there is a significant influence simultaneously between the independent variables (fuel prices and Basic Electricity Tariff) toward dependent variable (Poverty).

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