ECONOMIC GROWTH, INCOME DISTRIBUTION AND POVERTY IN CENTRAL JAVA

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Abstract

Among the central issues in policy making are poverty alleviation and increasing income distribution. This paper measures the impact of economic growth on income inequality and poverty alleviation, namely whether income inequality becomes trade-off for poverty alleviation in 35 Central Java regencies. The paper uses fixed effect model by weighting cross section weights. The results show that economic growth increases income inequality. Furthermore, economic growth alleviates poverty and increases income inequality, but the effect is smaller than the reduction in poverty. Therefore, the increased income inequality is not a trade off to poverty alleviation and the economic growth is effective to alleviate poverty.

Keywords: Economic growth, income inequality, poverty alleviation
JEL classification numbers: O49, D33, D39, I32

Abstrak

Isu-isu inti dalam penyusunan agenda kebijakan diantaranya adalah pengurangan tingkat kemiskinan dan peningkatan distribusi pendapatan. Makalah ini meneliti dampak pertumbuhan ekonomi terhadap kesenjangan pendapatan dan pengurangan kemiskinan, yaitu apakah kesenjangan pendapatan menjadi trade-off untuk pengentasan kemiskinan di 35 kabupaten di Jawa Tengah. Makalah ini menggunakan model *Fixed Effect* dengan bobot lintas kelembagaan. Hasil penelitian menunjukkan bahwa pertumbuhan ekonomi meningkatkan ketimpangan pendapatan. Selanjutnya, pertumbuhan ekonomi dapat mengurangi kemiskinan dan ketimpangan peningkatan pendapatan, tetapi pengaruhnya lebih kecil dari pengurangan kemiskinan. Oleh karena itu, meningkatnya kesenjangan pendapatan bukan merupakan *trade-off* bagi pengentasan kemiskinan dan pertumbuhan ekonomi merupakan faktor yang efektif untuk mengurangi kemiskinan.

Keywords: Pertumbuhan ekonomi, ketimpangan pendapatan, pengurangan kemiskinan
JEL classification numbers: O49, D33, D39, I32

INTRODUCTION

Poverty alleviation has long been a central issue in policy making by national and regional governments. Kakwani et al. (2004) argue that the most important objective of development is poverty alleviation, which can be achieved through either high economic growth or more equal income distribution. The analysis of the two-way relationship between economic growth and income inequality has been a long standing, very interesting debate among researchers and economists, through studies for theoretical scientific purposes. Policy makers, especially in developing countries, have focused their concern primarily on the choice of development strategy: put priority on economic growth or prompt income distribution with the ultimate objective of eradicating poverty.

Indonesia has long implemented programs aiming at reducing income inequality and poverty, *i.e.* since the first long-

term development phase (1969/1970-1993/1994) through, among others, agricultural credit (KUT) and Presidential Instruction (Inpres). At the beginning of the second long-term development phase (1994/1995-1997/1998), the program of income redistribution and poverty alleviation was officially launched. One of the measures is Backward Village Presidential Instruction (IDT). After the economic crisis of 1997 until 2005, the most popular program in order to eradicate poverty has been Welfare Family Program (Prokesra), Regional Empowerment Program in Dealing with Economic Crisis (PDM-DKE), Social Safety Net (JPS), and the most controversial one is Cash Direct Subsidy (BLT). All of the above programs are aimed to distribute income and to eradicate poverty either directly by targeting poor people or indirectly through the development of physical and social infrastructures. Economic growth serves as the generator of programs aiming at reducing income inequality and poverty. However, other factors suc as income distribution also play an importan role if the economic growth shoul reduce poverty (see, for example, Ghosh, 2010). Based on the data of the Central Statistics Agency, during the period of 1969-1983 and 1983-1990, the Indonesian economy grew at an average of 7.26 percent and 5.44 percent, respectively. During 1990s until mid 1997 (the economic crisis), the Indonesian economy grew at an average of more than 7 percent. After experiencing a negative growth during the economic crisis, the economy improved steadily and grew at 4.71 percent on average during 2000-2005. On the other hand, number and percentage of poor people during 1976-1996 decreased from 54.2 million people (40.08 percent) in 1976 to 22.5 million people (11.34 percent) in 1996. When the standard of 1998 is used, number of poor people in 1996 was 34.5 million people (17.65 percent). If these figures are compared with those in 2005, in which the number of poor people was 35.1 million people or 15.97 percent, there has been a decrease in percentage, but an increase in absolute number. With regards to Gini index, income inequality in Indonesia during the above periods has fluctuated. After decreasing during 1978-1996 from 0.38 in 1978 to 0.36 in 1996, during 1999-2005, the figure increased from 0.31 in 1999 to 0.36 in 2005.

Kuznets (1955) initiated research on the relationship between economic growth and income inequality. Kuznets found an "inverted U-curve" between these variables. The hypothesis suggests that individual country's income inequality increases at the early stage of development, tends to be stagnant in the middle, and continues to decrease when the particular country increases its welfare. Kuznets also emphasized the occurrence of structural change in economic development, where industrial and service sectors tend to develop and there would be a shift from traditional to modern sectors. During the transition period, productivity and wage in modern sectors would be higher than those in traditional sectors, leading to higher expected income percapita. As a consequence, income inequality between these two sectors would increase in the early stage of development.

The validity of "inverted U-curve" hypothesis implies that when a country is at its early stage of development, economic growth will increase income inequality; consequently poverty alleviation will take longer time (Adam, 2004). Review on subsequent studies indicates inconsistent results: some studies absolutely support the "inverted U-curve" (Oshima, 1962), some support partially (Ahluwalia, 1976a and 1976b), and some reject the hypothesis (Deininger and Squire, 1996). Oshima used data on household income in Malaysia (1957-1958), Sri Lanka (1952-1953), The Philippines (1957-1958), India (1952) and Japan (1958-1959) as his research reference in Asia. Having analyzed quintile share dis-

tribution and personal income, he absolutely supported the "inverted U-curve" hypothesis.

Another study by Ahluwalia, with a sample size of 60 countries (consisting of 40 developing countries, 14 developed countries, and 6 socialistic countries) using multivariate regression analysis to estimate country cross-sectional data on income share of different percentile groups by selected variables, has reflected development process that may influence income distribution (income percapita). Parts of the results support the "inverted U-curve" hypothesis. Ahluwalia concludes that at a particular development stage, high economic growth does not necessarily lead to increased income inequality and that there is a fact that can be adopted that the relationship between income percapita (in logarithm) and income inequality (highest 20% percentile) follows the "inverted U-curve" hypothesis.

Using a better, panel data set which later becomes a standard reference for other studies because it covers 682 observations (108 countries) - 65 percent of which was obtained from main sources (approximately 50 percent from official statistics agencies, 15 percent from reputable international organizations, and 35 percent from main sources that have been cited from trusted second sources), Deinenger and Square executed several tests by which they confirmed that there was no systematic association between economic growth and income inequality, thereby rejecting Kuznet's "inverted U-curve" hypothesis.

The most current studies on economic development did not focus on the validity of the"inverted U-curve" hypothesis from Kuznets, instead, they have shifted to the positive impact of economic growth on poverty alleviation with potential tradeoff on increased income inequality. This implies positive correlation between economic growth and income inequality. Some of the studies focused on single country such as Ravallion and Datt (1996), Wodon (1999), and Lin (2003).

Using time series data (1951-1991), Ravallion and Datt undertook a research in India on the impact of sectoral economic growth and migration from rural to urban areas on poverty in urban as well as rural areas. The findings suggest that during the period, average income perkapita increased, while income inequality showed a decreasing trend. In his research on poverty in the rural areas of the People's Republic of China, Lin (2003) found that not only did the economic growth in China during 1985-2001 decrease poverty, but also increased income inequality, leading to reduction in poverty alleviation effectiveness.

Wodon (1999), using panel data model specification in logs and involved 70 national observations (30 observations in urban areas and 40 observations in rural areas) concluded that there was a positive correlation between economic growth and income inequality at the national level and in urban areas, with higher estimated coefficient of parameter in urban areas than that at national level. In rural areas, systematic correlation between economic growth and income inequality was not observed.

The World Bank defined pro-poor economic growth as economic growth whose impact can reduce poverty rate (Ravallion and Chen, 2004). Kakwani et al. (2004) provided more detailed definition of pro-poor economic growth. First is relative pro-poor growth, when economic growth results in higher proportionate benefit for the poor than for the non poor. Second is absolute pro-poor growth, when poor people receive absolute benefit from the economic growth which is at least similar to or higher than that received by non poor people. In other words, economic growth successfully decreases poverty rate and reduces income inequality as well.

Measurement of pro poor economic growth can be done through pro-poor growth index (φ) formulated by Kakwani

and Pernia (2000). However, there are notations and terms proposed by Wodon (1999) and criteria of effectiveness by Lin (2003), resulting in the following measurement:

$$\Phi = \frac{\lambda}{\gamma} = \left(1 + \frac{\beta\delta}{\gamma}\right) \quad (1)$$

where β is elasticity of income inequality on economic growth, δ is elasticity of poverty on income inequality, γ is gross elasticity of poverty on economic growth, and λ is net elasticity of poverty on economic growth.

The criteria of growth effectiveness on poverty alleviation based on the above pro-poor growth index are as follows:

(1) $\Phi < 0$: anti- poor growth,
(2) $\Phi = 0$: growth is neutral to poverty alleviation,
(3) $0 < \Phi < 0.5$: growth is weak in alleviating poverty,
(4) $0.5 \leq \Phi \leq 1$: growth is effective in alleviating poverty,
(5) $\Phi > 1$: pro poor growth.

Based on its causes, poverty is divided into two types. First is cultural poverty, which results from customary or cultural factors that inhibit particular individuals or groups so as to trap them into poverty. Second is structural poverty, which is the consequence of powerlessness of particular individuals or groups, against unfair social system or structure, leading to very weak bargaining power and constrained access to develop themselves and to get rid of poverty trap.

Conceptually poverty is categorized into relative and absolute poverty. The difference lies in their measurement standards. Relative poverty measurement standard is determined subjectively by local people, is valid for local reference, and those who live below the measurement standard are categorized as relatively poor. Absolute poverty measurement standard is the minimum living standard that is required to fulfill necessary basic needs including food and non food. The minimum living standard is the so called poverty line. The Central Statistics Agency defines poverty line as a certain amount of Rupiahs one has to spend in a month to meet basic need of calorie intake of 2,100 kkal/day percapita (food poverty line) plus minimum non food needs including housing, clothes, school and transportation as well as other personal and household needs (non food poverty line). The rate of poverty line is presented at the appendix.

Measurement of absolute poverty should use measures that do not only reflect the occurrence of absolute poverty, but also consider income distribution among poor people. Sen (1976) stated that poverty rate should increase as living standard decreases (monotonicity axiom) or when transfer from non poor people to poor people takes place (transfer axiom). Therefore, Sen proposed the following poverty index (P):

$$P = H\,[I + (1-I)G] \text{ with } I = \frac{1}{q}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right) \quad (2)$$

where H is percentage of poor people, I is income gap ratio, G is Gini index, z is poverty line, y_i (i = 1, 2, ... and $y_i < z$) is average monthly expenditure percapita of people living below poverty line, and q is number of people living below poverty line. When one of the factors (H, I or G) increases, poverty index (P) will increase as well resulting in higher poverty rate.

Foster et al. (1984) proposed the following poverty measure that meets the above axioms:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)\alpha \quad (3)$$

where α = 0, 1, 2, z (i = 1,2,...q and $y_i < z$) is poverty line, y_i is average monthly expenditure of people living below poverty line, q is number of people living below poverty line, and is n is number of people.

Based on the α coefficient, the three poverty measurements are: 1). When $\alpha = 0$, it is called Head Count Index (*HCI*). *HCI* is the percentage of people living below poverty line (percentage of poor people). 2). When $\alpha = 1$, it is called Poverty Gap Index (*PGI*). PGI is the measurement of the average gap of poor people's expenditure to poverty line. The higher the *PGI*, the bigger the average gap of poor people's expenditure to poverty line. 3). When $\alpha = 2$, it is called Poverty Severity Index (*SPI*). *SPI* measures expenditure gap among poor people. The higher the *SPI*, the bigger the expenditure gap among poor people.

Pareto having studied income distribution in Europe, found that the curves of individual countries do not follow normal distribution, instead they confirms the following formula:

$$A = \frac{N}{X^{b}} \quad (4)$$

where A is number of people with income higher than X, N is number of population, b is parameter whose value lies between 1 and 2.

Based on the results, Pareto said that income inequality would continuously be observed in individual countries, where the richest group of population get the biggest portion of national income. His finding was later known as Pareto Law, saying that the richest 20 percent of population enjoy 80 percent of national income.

There are a number of ways of measuring income inequality. The World Bank, in its effort to measure income inequality divides population into three groups: 40 percent low-income group, 40 percent middle-income group, and 20 percent high-income group. Income inequality is calculated based on the percentage of national income received by 40 percent low-income group with the following criteria. (1) When the percentage of income received by 40 percent low-income group is smaller than 12 percent, income inequality is high. (2) When the percentage of income received by 40 percent low-income group lies between 12 to 17 percent, income inequality is moderate. (3) When the percentage of income received by 40 percent low-income group is higher than 17 percent, income inequality is low.

Another popular measurement to measure income inequality is Gini index. Gini index is based on Lorenz curve where income distribution is described as Lorenz curve showing the relationship between cumulative percentage of population receiving income and cumulative percentage of income received by population. Gini index lies between 0 and 1. The higher the Gini index, the higher the income inequality. Zero reflects perfect income equality, and one means perfect income inequality.

Based on the above description, theory and previous research, it is interesting to study the correlation between economic growth in Central Java and income distribution and poverty in the province. This research is aimed to find out and analyzing the direction (positive/negative) of the impact of economic growth on income inequality, economic growth and income inequality on poverty alleviation, and to analyze whether income inequality has a trade off with poverty alleviation, to estimate the parameters of gross elasticity of poverty on economic growth, elasticity of income inequality on economic growth, elasticity of poverty on income inequality, and net elasticity of poverty on economic growth and to analyze the effectiveness of economic growth on poverty alleviation.

METHODS

Model Specification

This study employs the model developed by Wodon (1999) using panel data in logarithm, with every single model directed to answer the above research questions. To address the question whether economic

growth increases income inequality and to get the elasticity measure, the specified research model is:

$$\log G_{kt} = \alpha_k + \beta \log R_{kt} + \xi_{kt} \quad (5)$$

where G_{kt} is Gini index of area k during t period, R_{kt} is economic growth of area k during t period, α_k is common-fixed-random effect of area k, and ξ_{kt} is disturbance term.

Using log-log specification model, β parameter directly symbolizes the elasticity of income inequality on economic growth. Therefore, the first equation can answer the elasticity as well.

Research model specification that is used to address the question whether economic growth alleviates poverty and to get the gross elasticity is presented as follows:

$$\log P_{kt} = \omega_k + \gamma \log R_{kt} + \delta \log G_{kt} + v_{kt} \quad (6)$$

where P_{kt} is poverty figure (Head Count Index) of area k during t period, G_{kt} is Gini index of area k during t period, R_{kt} is economic growth of area k during t period, ω_k is common-fixed-random effect of area k, and v_{kt} is disturbance term, γ is gross elasticity of poverty on economic growth, and δ is elasticity of poverty on income inequality. Therefore, net elasticity of poverty on economic growth (λ) is defined as follows:

$$\lambda = \gamma + (\beta \times \delta) \quad (7)$$

The impact of economic growth on poverty can be obtained by regressing directly on:

$$\text{Log } P_{kt} = \omega_k + \gamma \text{ Log } R_{kt} + v_{kt} \quad (8)$$

where P_{kt} is poverty figure (Head Count Index) of area k during t period, R_{kt} is economic growth of area k during t period, ω_k is common-fixed-random effect of area k, and v_{kt} is disturbance term.

To measure pro-poor growth index (Φ), this study employs the measure used by Kakwani and Pernia (2000) as follows:

$$\Phi = \frac{\lambda}{y} = \frac{y + (\beta\chi\delta)}{y} = 1 + \frac{(\beta\chi\delta)}{y} \quad (9)$$

The criteria to measure the effectiveness of economic growth on poverty alleviation follow those developed by Lin (2003):

(1) $\Phi < 0$: anti poor growth
(2) $\Phi = 0$: growth is neutral to poverty alleviation
(3) $0 < \Phi < 0.5$: growth is weak in alleviating poverty
(4) $0.5 \leq \Phi \leq 1$: growth is effective in alleviating poverty
(5) $\Phi > 1$: pro poor growth.

Operational Description of Variables

Poverty Rate (Head Count Index)

Poverty is a condition when individuals are not able to meet minimum basic needs. Minimum basic need is translated into financial measure in monetary terms. The value of minimum needs or basic needs is the so called poverty line. Concept and definition of poor people refer to those adopted by Indonesia Central Bureau of Statistics (BPS). BPS calculated number and percentage of poor people based on expenditure percapita. The amount of Rupiahs to spend for meeting minimum food equal to 2,100 kkal/per day percapita and on food basic needs (housing, clothes, school, transportation and other personal as well as household needs) is called poverty line. People with monthly expenditure lower than poverty line are categorized as poor people. This research used the percentage of poor people (HCI) of regencies/municipalities in Central Java during the period of 2002-2007.

Foster et al. (1984) defined the following poverty measure:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)\alpha \qquad (10)$$

where α is 0, 1, 2, z (i = 1,2,...q and $y_i < z$) is poverty line, y_i is average monthly expenditure of people living below poverty line, q is number of people living below poverty line, and n is number of population.

When α = 0, *HCI* (Head Count Index)/ Percentage of poor people is obtained. When α = 1, Poverty Gap Index is obtained. When α = 2, Poverty Severity Index is obtained.

Economic Growth

Economic growth is the development of real gross domestic regional product in Rupiah (based on constant prices). Economic growth is defined as the difference between current gross domestic regional product and the previous gross domestic regional product divided by the previous gross domestic regional product multiplied by 100 percent. Economic growth is generally measured by the increase in constant value (gross domestic regional product at constant prices). The formula used to measure economic growth is as follows:

$$r = \{n\text{-}1\sqrt{(t_n/t_o)}\text{-}1\} \text{ x } 100\ \%$$

where r is annual economic growth rate, n is number of years, t_n is period's last year, and t_0 is period's initial year

Income Inequality

This study employs Gini index, published by the Central Statistics Agency Central Java, as the measure of income inequality. The Agency used expenditure data instead of income (because income data is not available). It should be noted that Gini index using expenditure data tends to be lower than income data. This is due to the fact that for all provinces in Indonesia, expenditure could be a proxy of income of low to middle-income group of population, but is not applicable to high-income group. The formula used to measure Gini index is as follows:

$$G = 1 - \sum_{i=1}^{k}\frac{P_i(Q_i + Q_{i-1})}{10000} \qquad (11)$$

Notes:
G is Gini Index, P_i is percentage of households of i income group, Q_i is cumulative percentage of income up to i group, $Q_{i\text{-}1}$ is cumulative percentage of income up to i group, and k is number of income groups.

Steps of Data Analysis

Selecting the Best Panel Data Analysis Model

This was executed through the following procedure: first, selecting between model without individual effect (common effect) or model with individual effect (fixed dan random effect). Selection between these two alternatives could be well done manually through F test or using Eviews program (Wald test). The criteria of F_{test} is that when $F_{statistic}$ is higher than F_{tabel} ($F_{n\text{-}1,nt\text{-}n\text{-}k}$ (α%)), H_0 is rejected. Consequently, panel data analysis will employ individual-effect model.

Executing significance test:

a) Simultaneous test (F_{test})
   To find out whether all independent variables simultaneously determine the dependent variable in regression models.
b) Partial test (t_{test})
   Partial test is aimed to test individually the effect of independent variables in the models on the dependent variable.

RESULTS DISCUSSION

The Economy of Central Java

During the period of 2002-2007, the economy of Central Java tends to improve. This is indicated by the increase in gross regional domestic product. The economy of

Central Java increased from 4.32 percent in 2006 to 4.82 percent in 2007. This represents a quite high rate after the economic crisis of 1998. This is due to the fact that 2007 was a relatively stable year as indicated by inflation and interest rates which reached the lowest level during the period.

From the perspective of individual regencies/municipalities in Central Java, almost all of them showed a higher growth rate in 2007 as compared to the previous year. This indicates that the economy of Central Java in that year was rising and showed a general improvement.

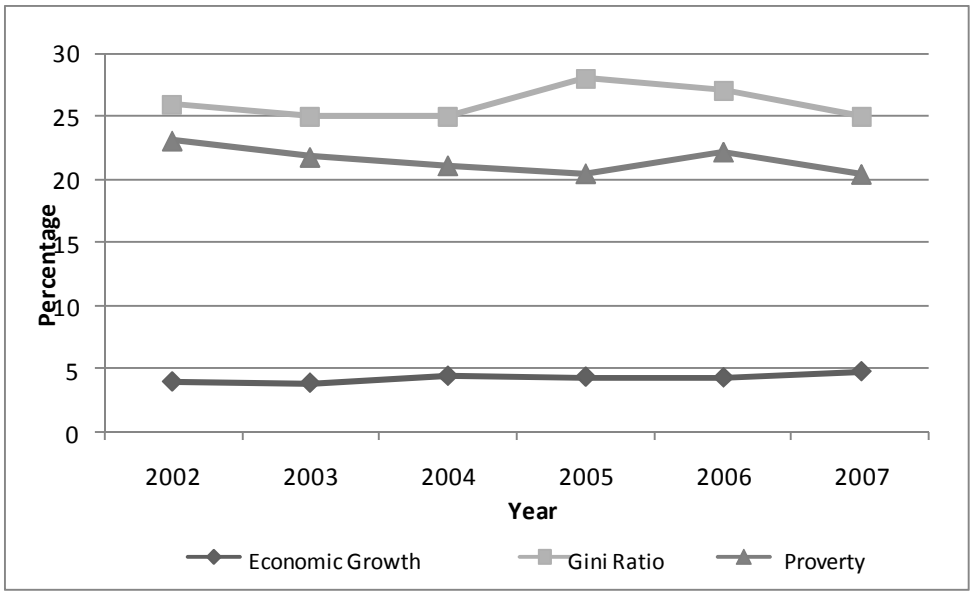
The average percapita consumption in Central Java during the period of 2002-2007 increased from IDR 172,288.00 in 2002 to IDR 250,182.00 per month in 2007. However, there was a shift in consumption pattern. Expenditure for food decreased from 61.29 percent in 2002 to 56.93 percent in 2007, conversely the percentage of non food expenditure increased from 38.71 percent in 2002 to 43.07 percent in 2004. This indicates a higher welfare of people in Central Java, because the increase in non food consumption and decrease in food consumption suggest a relatively higher income.

Income inequality can be described via Gini ratio. Gini ratio of Central Java in 2002 was 0.26. This figure decreased to 0.25 in 2003. Having increased to 0.28 in 2005, the figure decreased again to 0.27 and 0.25 in 2006 and 2007, respectively. The decrease in Gini ratio indicates more equal distribution of development.

Poverty rate in Central Java during 2007 decreased from 22.19 percent in 2006 to 20.43 percent in 2007. The same trend can be observed in 2003 and 2004, when the ratio decreased from 23.06 percent in 2002 to 21.78 percent in 2003 and again decreased to 21.11 percent in 2004, though it increased to 22.19 percent in 2005.

Source: Data calculation.

Figure 1: Percentage of Average Consumption Percapita of Central Java 2003-2007



Source: Data calculation.

Figure 2: Economic Growth, Gini Ratio and Poverty in Central Java 2002 -2007

Table 1: $F_{statistic}$ and F_{table}, Impact of Economic Growth on Income Inequality

R^2 Common Effect	R^2 Fixed Effect	F_{test}	F_{table}
0.037278	0.389748	4.6282	$F_{(34,174,95\%)} = 1.418$

Source: Data estimation.

Table 2: LM and χ^2_{tabel}, Impact of Economic Growth on Income Inequality

Statistic LM	χ^2_{tabel}
82.86	$\chi^2_{(34,95\%)} = 43.773$

Source: Data estimation.

Table 3: Panel Data Regression, Impact of Economic Growth on Income Inequality

Log $G_{kt} = \alpha_k + \beta$ Log $R_{kt} + \xi_{kt}$		
Adjusted R^2	$F_{statistic}$	B
0.980651	10,208,33	0.062

Source: Data estimation.

The Impact of Economic Growth on Income Inequality

Table 1 presents that all data used to regress the model on the impact of economic growth on income inequality have shown that $F_{statistic} > F_{tabel}$ leading to rejection of the null hypothesis (H_0). Therefore, it is concluded that the best panel data analysis model is individual effect model.

The test results using $LM_{statistic}$ as shown at table 2, where all values of $LM_{statistic} > \chi^2_{tabel}$, lead to rejection of the null hypothesis. This implies that the residual covariance structure of the model on the im-

pact of economic growth on income inequality is heteroskedastic. Therefore, the selected estimator is *weighting cross section weights.*

Based on Table 3, simultaneous test (F_{test}) shows that the model can be used as estimation model. The elasticity parameter *(β)* directly symbolizes the elasticity of income inequality on economic growth with positive sign. This indicates that the logarithm of economic growth is positively correlated with the logarithm of income inequality (Gini index logarithm). Therefore, economic growth will increase income inequality.

The increase in income inequality as the result of economic growth was due to the fact that the benefit of economic growth are not received equally by all people, instead, only by a small group of mainly non poor population. Because the biggest portion of economic growth is enjoyed by non poor people, and the rest goes to poor people, increasing income inequality will occur.

The extent of income inequality depends upon the absolute value of the elasticity parameter. The estimation results suggest that when the economy grows by 1 percent, income inequality will increase by 0.06 percent.

This finding clearly points to the need to develop labor-intensive sectors as the generator of economic growth.

Impact of Economic Growth and Income Inequality on Poverty

Steps to select the best panel data analysis model on the impact of economic growth and income inequality on poverty were also applied. F_{test} found that $F_{statistic} > F_{table}$. Therefore the null hypothesis was rejected, implying that model with individual effect is better than that with common effect.

Based on the above calculation, $LM_{statistic} > \chi^2_{\text{tabel}}$ indicating the rejection of hypothesis. Therefore, the model's residual covariance structure is heteroskedastic or in other words, the estimator uses weighting cross section weights.

Table 4: $F_{statistic}$ and F_{table}, Impact of Economic Growth and Income Inequality on Poverty

R^2 Common Effect	R^2 Fixed Effect	$F_{statistic}$	F_{table}
0.063860	0.969488	151.0319	$F_{(34,174,95\%)} = 1.418$

Source: Data estimation.

Table 5: $LM_{statistic}$ and χ^2_{table}, Impact of Economic Growth and Income Inequality on Poverty

$LM_{statistic}$	χ^2_{tabel}
73.38	$\chi^2_{(34,95\%)} = 43.773$

Source: Data estimation.

Table 6: Regression Results of Panel Data of the Model on the Impact of Economic Growth and Income Inequality on Poverty

$$\log P_{kt} = \omega_k + \gamma \log R_{kt} + \delta \log G_{kt} + v_{kt}$$

Adjusted R^2	F-statistic	γ	Δ
0.998344	126,027,1	-0.033	0.008

Source: Data estimation.

Simultaneous test (F_{test}) that was shortly presented at table 6 found significant F_{test} at 1 percent error probability. This shows that simultaneously all independent variables in the model yang terdapat dalam model, including the logarithms of economic growth and income inequality significantly determine the logarithm of poverty rate. Table 6 also indicates that all elasticity parameters are statistically significant at 1 percent error probability. This implies that partially the logarithms of economic growth and income inequality determine the logarithm of poverty, hence, feasible estimating model.

The estimation results at table 6 shows that the parameter of gross elasticity of poverty on economic growth has a negative sign. This suggests that the logarithm of economic growth is positively correlated with the logarithm of poverty rate. Therefore economic growth will decrease poverty rate. The estimation results show that the coefficient of gross elasticity parameter of poverty on economic growth is 0.033. This implies that when the economy grows by 1 percent, without any change in income equality, poverty rate will reduce by 0.03 percent.

Table 6 also indicates positive sign of the elasticity of poverty on income inequality. However, the positive coefficient is much smaller than the negative coefficient of the elasticity of poverty on economic growth. This implies that the impact of economic growth on increased income inequality is smaller than that on poverty alleviation. Therefore, increased income inequality resulting from increased economic growth is not a tradeoff to poverty alleviation. It can then be concluded that development process relying on high economic growth with poverty alleviation achievement may proceed despite increased income inequality.

This conclusion is at least supported by poverty severity index (P2) and poverty gap index (P1) that tend to decrease. It shows improved poor people's welfare, where the average expenditure of poor people is approaching poverty line and the gap of average expenditure among poor people is narrowing. Increased income inequality is caused by the fact that a small proportion of poor people enjoy a smaller proportion of economic growth. Therefore, income inequality is not a tradeoff to poverty alleviation.

The finding that the value of the effect of economic growth is always higher than that of income inequality (Table 7) shows that economic growth, instead of income inequality, is the main driver of poverty alleviation. Based on pro-poor growth index as presented at table 7, economic growth has a value of 0.98. Therefore, based on Lin's criteria (2003), the economic growth in Central Java is an effective economic growth in alleviating poverty. This further leads to a conclusion that the economic growth in central Java increased the income of poor people. Development programs to trigger economic growth in Central Java, due to their capacity, should be continuously promoted.

Table 7: Pro-poor Growth Index and Decomposition of Impact (net) of Economic Growth on Poverty

Effect of economic growth (γ)	Effect of income inequality ($\beta x \delta$)	Net elasticity of poverty on economic growth (λ)	Pro-poor growth index (Φ)
-0.033	(0.062 x 0.008) = 0.000496	-0.032504	0.98

Source: Data estimation.

This studies is not without shortcoming, which are: 1) In this study, the research object is not differentiated by urban and rural areas. When it is differentiated, the difference between both areas can be observed. However, there is no sufficient data to support the separation. 2) The author did not include the oil and gas-based economic growth despite the fact that Central Java has sources of oil and gas such as those in Cilacap and Blora regencies. The economic growth calculated in this study is non oil and gas economic growth. 3) Data on Gini Index was based on expenditure, that results in potential lower measure than that based on income. As a result, the measure on income inequality in this study might be underestimated.

CONCLUSION

Some conclusions can be drawn from the research. First, economic growth in Central Java will increase income inequality, but the impact is lower than the economic growth. Second, even though the economic growth in Central Java increases income inequality, the effect of economic growth on poverty alleviation is bigger than the effect of economic growth on increased income inequality. Therefore, the increased income inequality does not serve as a tradeoff for poverty alleviation. Third, when the economy grows by 1 percent, poverty rate will decrease by 0.032 percent and because the pro-poor growth index is 0.98, it can be concluded that economic growth in Central Java is effective in eradicating poverty.

Fourth, based on the above finding that the economic growth in Central Java effectively alleviates poverty, it is expected the Government of Central Java Province proceed on development process relying on economic growth that is equally distributed to all income groups, and to promote sectors where poor people earn for their living such as agriculture and labor-intensive sectors. Fifth, income inequality, despite positive finding of this study that it is not a constraint to poverty alleviation, should be narrowed. This is due the fact that income inequality will trigger dissatisfaction that may lead to social crisis. Therefore, the Government of Central Java Province is recommended to implement programs focusing on gradual reduction of income inequality.

Sixth, the current development process has confirmed the development objective to alleviate poverty. This is due to the fact that the benefit of economic development, measured by economic growth, in general has been garnered more by poor people than by non poor people. The government of Central Java Province, therefore, should promote the economic development. Seventh, the government of Central Java Province should create fair, well-distributed, and sustainable programs. The biggest concern should be paid to alleviate poverty and to narrow income inequality, because fair and well-distributed development means that the benefit goes to all population groups. Sustainability implies that poverty alleviation resulting from development should be sustainable in order to achieve a condition where number of poor people in Central Java should be kept minimum.

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