Inequality and Economic Growth in Indonesia in The 2000's

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Abstract

The income inequality in Indonesia reached the highest level during the decentralization era and suspected to be the cause of the slowdown of the economic growth in the last five years to 2015. This paper investigates whether increasing inequality had a positive or negative impact on economic growth in Indonesia. Using dynamic panel and applying Generalized Method of Moments (GMM) estimator, the result concluded that there is a significant positive relationship between income inequality and economic growth. However, this study cannot draw a definite conclusion about the association for the different classes (bottom, middle, and top level) since only one-step system GMM is significant. Based on the result, it implies that the government should be more careful in regulating the inequality policy and understand more about the right mechanism of inequality and economy growth.

Keywords: inequality, economic growth, generalized method of moments

Abstrak

Ketimpangan di Indonesia mencapai level tertinggi selama era-desentralisasi dan ditenggarai sebagai penyebab menurunnya pertumbuhan ekonomi dalam lima tahun terakhir ke 2015. Tulisan ini meneliti apakah peningkatan ketimpangan memiliki dampak positif atau negatif terhadap pertumbuhan ekonomi di Indonesia. Dengan menggunakan model dinamis dan Generalized Method of Moments (GMM) estimator, hasil yang didapat menunjukan bahwa ada hubungan yang positif signifikan antara ketimpangan pendapatan dan pertumbuhan ekonomi. Namun, tulisan ini tidak dapat menyimpulkan hubungannya pada kelas yang berbeda (kelas bawah, menengah dan atas) karena hasil signifikan hanya diperoleh ketika menggunakan one-step system GMM. Hasil penelitian dapat menjadi pertimbangan pemerintah agar lebih berhati-hati dalam menyusun kebijakan terkait ketimpangan.

Kata Kunci: ketimpangan, pertumbuhan, generalized method of moments

Introduction

The relationship of inequality and economic growth has been studied by many academics for the last three decades and remain interesting to debate due to the variation of the result; which can be positive, negative or even insignificant. There are two different analyses to investigate the effect of inequality on growth that are cross-country and in-country studies. The first set of cross-country studies (Alesina and Rodrik, 1994; Clarke, 1995; Peroti, 1996; Alesina and Peroti, 1996) used cross-section data and concluded the adverse effect of inequality on growth. It means that increasing of inequality hampered the economic growth. The similar result also found in the study conducted by Persson and Tabellini (1994), which used cross-section data for developed and less-developed countries. Moreover, they also used panel data of nine developed countries to examine the effect of inequality on economic growth and confirmed that inequality negatively influenced growth.

However, other studies began to challenge the negative relationship between inequality and economic growth in cross-country analysis by improving the quality of data and methodological procedure. They improved the quality of data by using Deininger and Square's dataset. While for the methodological procedure, it developed by applying panel estimation technique and Arellano-Bond estimator. In contrast with the previous research that used cross-section data, the studies using panel data found a positive relationship between inequality and growth (Li and Zou, 1998; Forbes, 2000). However, using panel data and dividing the sample into developing and developed countries, Barro (2000) found different results; a negative relationship for poor countries, a positive effect for rich countries, and an insignificant result if both groups considered.

The various results in the cross-country studies motivated academics to conduct a meta-analytic study. There are at least two meta-analytic studies conducted by Dominics et al (2008) and Neves et al (2016). Dominics et al. (2008) found that the various results determined by the data used, time span, sample coverage, and methods. Neves et al. (2016) found that cross-section studies tended to yield an adverse effect than panel data studies and the negative effect clearer in the developing countries than the developed countries. Contradict with Dominics et al. (2008), Neves et al. (2016) concluded that the estimation technique, quality of data, and specification of the growth regression do not significantly influence the results.

Since cross-country analysis cannot necessarily be applied in the research of inequality impact on economic growth in a country, researcher started to focus on investigating it at a country level (Partridge, 1997; Panizza, 2002; Nahum, 2005; Benjamin et al., 2006). In the case of Indonesia, the study related to this topic was still limited. One of the studies conducted by Setiyowati (2013) that concluded the positive effect of inequality on growth. In other words, higher inequality gives a good impact on economic growth in Indonesia.

Inequality and economic growth became an important relationship to analyze, especially in the era of 2000's that known as the era decentralization in Indonesia. There is a presumption that increasing income inequality affects economic growth. Data show that income inequality that is measured by Gini coefficient reached its highest level ever

in the era of decentralization in 2011 with 0.41 and then plateaued for five years until 2015. Meanwhile, economic growth after the decentralization era is slower than before decentralization. In fact, economic growth fell in the five years to 2015 while the level of inequality remains flat. This fact raises a new concern; does income inequality hurt economic growth in Indonesia?

Figure 1. Indonesia's Economic Growth and Gini Coefficient, 1985 - 2015
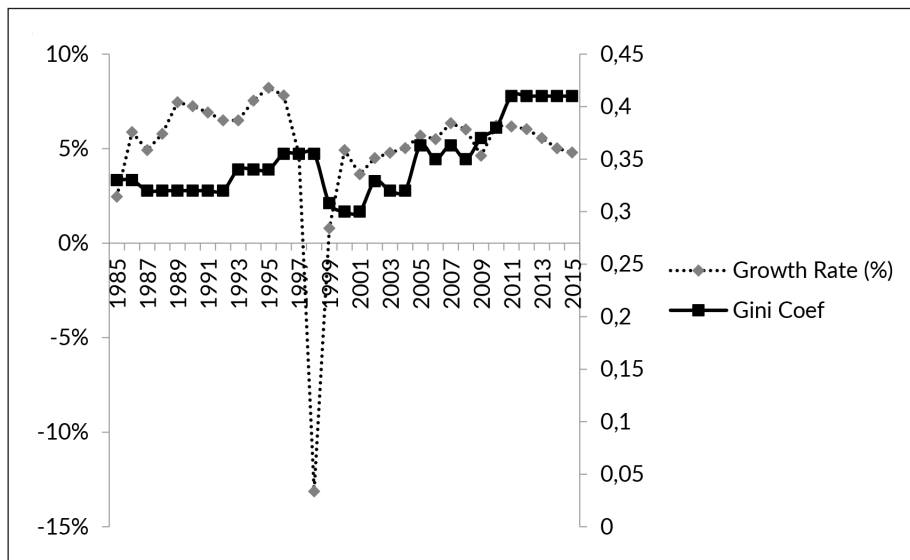
Source: Statistics Indonesia

The Indonesian government also thinks that these two factors are related and they suspect that the high level of inequality causes the slow pattern of growth. They began to demonstrate the seriousness of reducing inequality by launching the Economic Equity Policy in April 2017. Also, they identified inequality as an obstacle to sustainable growth and the government set a target in the current Medium Term Development Plan (RPJMN 2015-2019) for reducing the Gini coefficient, down from 0.41 to 0.36 by the year 2019. This concern is essential since if increasing inequality affects economic growth, then the efforts to reduce poverty might also be affected. Therefore, the high level of inequality in Indonesia, motivate the researchers to examine the relationship between inequality and economic growth. Consequently, the objective of this study is to determine whether increasing inequality had a positive or negative impact on economic growth in Indonesia.

The contribution of this paper is, firstly it focuses on the era of decentralization in Indonesia. Secondly, this study examines not only the general inequality (using Gini coefficient) but also inequality within and between classes by calculating another measurement as a proxy of income inequality, viz., Generalized Entropy index (GE(0) = mean log deviation, and GE(1) = Theil index) using National Socio-Economic Survey (Susenas) data from 2005 to 2015 . The last point, this study includes corruption and local government expenditure as variables to capture the era of decentralization.

Method

The growth regression is use as the model. To cover the endogeneity and reverse causality problems that commonly appeared in inequality and growth relationship, dynamic panel data is used following previous studies such as proposed by Caselli et al., 1996; Li and Zou, 1998; Forbes, 2000; Bond et al., 2001; Voichovsky, 2005; Setiyowati, 2013. The model is constructed as

$$\Delta y_{it} = \alpha y_{i,t-1} + X'_{it}\beta + Z'_{it}\gamma + v_i + u_{it} \tag{1}$$

Equivalently with

$$y_{it} = (\alpha + 1)\, y_{i,t-1} + X'_{it}\beta + Z'_{it}\gamma + v_i + u_{it} \tag{2}$$

Where:

y_{it} : Log of GRDP per capita for province i during period t

X'_{it} : Income inequality measurement. (Assumed as endogenous variable)

Z'_{it} : Vector of controlling variables

v_i : Unobserved province effect

Specifically for the main independent variable X'it, this study generates three regressions using the same model. First, to examine the impact of general inequality, X'it, is measured by the Gini coefficient. Then to investigate the impact of inequality in within and between classes, this study replaces the Gini coefficient with mean log deviation and Theil index. The equation may have several econometric problems. For example, the income inequality variables (general inequality, within, and between inequalities) in Xit assumed to be endogenous due to the causality that may run in both directions – for example, from Gini to economic growth and vice versa – thus these regressors may be correlated with the error term. Another problem is the presence of lagged dependent variable $y_{i,t-1}$, which is assumed as predetermined or weakly exogenous regressors. The lagged dependent variable correlated with past errors but uncorrelated with future errors. The last problem is the presence of an unobserved province effect v_i.

To cover those problems, this study uses Arellano-Bond (Arrelano and Bond, 1991) and Arellano-Bover/Blundell-Bond (Arellano and Bover, 1995; Blundell and Bond, 1998) estimator or known as difference and system GMM. All income inequality variables and lagged dependent variable treated as the endogenous variable in this study, so those variables are instrumented by the second lagged. The difference GMM instruments difference with levels, or uses $Gini_{i,t-2}$ as instrument for $\Delta Gini_{it}$, $bottom_{i,t-2}$ as instrument for $\Delta bottom_{it}$, $middle_{i,t-2}$ as instrument for $\Delta middle_{it}$, $top_{i,t-2}$ as instrument for Δtop_{it}, and $y_{i,t-2}$ as instrument for $\Delta y_{i,t-1}$. Then, the system GMM adds additional instruments by instrumenting levels with a difference. This study also applies the two-step estimation procedure in order to generate lower bias and standard errors (Roodman, 2009).

This study uses provincial data of 33 provinces during the period of time 2005 to 2015. The variables used in this study are presented in Table 1. There are two additional controlling variables, which are cor, and *lgovt*. The first one is used to capture the inaccuracy or unaccountability of local government financial report and the last one to capture the

decentralization era. To measure the inequality in within class and between classes, this study calculates mean log deviation and Theil index using expenditure data per capita. The expenditure data per capita from Susenas survey is obtained to measure the income inequality of the three classes of the economy: bottom (low-income group or poor), middle (medium income group) and top (high-income group or rich) class. For each province, the data is sorted from the lowest to the highest expenditure per capita then divided into three groups that are 40% as the bottom class, 40% as middle class and 20% as top class. The way of dividing the population into three groups is the same way the World Bank usually analyzes inequality.

Result and Discussion

To answer the research questions, the discussion is divided into two parts. The first part discusses the effect of general inequality on economic growth if the Gini coefficient is used as the proxy of income inequality. The second part explains the effect of inequality in the different class of the population (bottom, middle and top classes) by calculating mean log deviation and Theil index to replace the Gini coefficient.

Table 1 presents the regression results of one-step and two-step difference GMM and one-step and two-step system GMM. In general, the dynamic panel results satisfy the specification test, except for model 1 that applied one-step difference GMM using one period lagged dependent variable as a regressor. Model 1 shows that the error is serially correlated since the hypothesis that Δu_it is AR(2) cannot be rejected (using 10% of significance level). Moreover, this study uses robust standard error, so Hansen test is used instead of Sargan test. Hansen test results indicate that the instruments are not correlated with the error for all models. The hypothesis of Hansen test that the errors are not correlated with all exogenous variables cannot be rejected.

A longer lagged can be applied if the assumption in the specification test is rejected. Hence, this study adds more lagged of dependent variables as regressors and the results are presented in column (2). The two-step difference result is presented in column (3) while the one-step and two-step system GMM results are provided in columns four and five respectively. The use of system GMM estimator increases the number of observations from 201 to 247 and the number of instruments from 24 to 40. In general, using difference or system GMM, the beta coefficient of Gini variable shows a statistically positive and significant effect using 5% of significance level. Both estimators show a consistent result. The positive sign indicates that increasing inequality leads to higher growth in Indonesia.

It can be concluded that increasing income inequality in the era of 2000's, does not hamper economic growth in Indonesia, interestingly, it leads to higher growth. The result contrasts with the statement of the Indonesian government and the World Bank that believes tackling inequality will increase growth. Based on the result, reducing the inequality problem does not necessarily mean the growth of the economy will increase. So, if all this time the government believes and assumes that one of the solutions to increase the economic growth is by reducing the inequality, this study shows that it is not the right solution. It is a dilemma

for the Indonesian government, on the one, hand the high level of inequality is good for economic growth, but on the other side, the high level of inequality is not suitable for social reasons. Also, the government must prosper the people by realizing social justice for all Indonesian, or in other word cut the inequality gap.

Table 1: Estimation Results (Gini Coefficient)

Variable	1	2	3	4	5
	One-step difference		Two-step difference	One-step system	Two-step system
lgrdpcap (L1)	0.9289***	0.8563***	0.9381***	0.9461***	0.9524***
	(0.0376)	(0.0998)	(0.0419)	(0.0291)	(0.0496)
lgrdpcap (L2)		0.0291			
		(0.0853)			
Gini	0.2324**	0.2378**	0.2394**	0.1911**	0.1709**
	(0.1082)	(0.1123)	(0.0929)	(0.1056)	(0.0997)
MYS	0.0025	0.0006	0.0017	-0.0027	-0.0023
	(0.0066)	(0.0066)	(0.0085)	(0.0032)	(0.0037)
Temp	-0.0012	-0.0009	0.0007	-0.0009	-0.0005
	(0.0025)	(0.0027)	(0.0022)	(0.0015)	(0.0018)
Llabor	-0.0162	-0.0512	-0.0015	-0.0424*	-0.0349
	(0.0448)	(0.0508)	(0.0447)	(0.0247)	(0.0408)
Popgrowth	-0.7091***	-0.5901***	-0.5935***	-0.6800***	-0.6978***
	(0.1477)	(0.1535)	(0.1524)	(0.1028)	(0.1302)
Crimerates	0.0000	-0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Lgfcf	0.0202	0.0375	0.0095	0.0453*	0.0386
	(0.0143)	(0.0283)	(0.0178)	(0.0262)	(0.0418)
Cor	-0.0047	-0.0208**	-0.0064	0.0063	0.0067
	(0.0066)	(0.0094)	(0.0088)	(0.0077)	(0.0097)
Lgovt	0.0019**	0.0019**	0.0023***	-0.0015	-0.001
	(0.0008)	(0.0009)	(0.0006)	(0.0034)	(0.003)
N	201	176	201	247	247
F-stat	241.37	218.45	172.52	15867.76	13826.14
P-values	0.000	0.000	0.000	0.000	0.000
AR(1)	0.004	0.009	0.007	0.008	0.008
AR(2)	0.083	0.148	0.264	0.151	0.172
Hansen Test	0.120	0.299	0.120	0.639	0.639
Number of instrument	24	22	24	40	40

***$p<0.01$, **$p<0.5$, *$p<0.1$. (Robust standard errors in parantheses)

Moreover, this result is in line with the study conducted by Setiyowati (2013) that concluded the same result, a positive relationship between income inequality and economic growth in Indonesia. She believed the high level of income inequality could boost the economic growth. This result somehow is different from other in-country studies such as Panizza (2002) and Benjamin et al. (2006) who both found a negative relationship between US and China.

Also, the result contradicts some cross-country studies like Barro's (2000) and Castelló-Climent (2010) findings. Barro's (2000) found that the positive relationship was associated with the high-income countries while in the case of Indonesia, this study concludes positive relationship even though Indonesia is not a high-income country but categorized as a low middle-income country. The latter found that the effect depends on the level of development, a negative effect of income inequality on economic growth in the sample of low and middle-income economies, but becomes positive in the developed countries.

Literature reviews suggest that inequality can both boost and hamper growth. The mechanism seems complex, so this study tries to separate the inequality in a different class of the population to examine which class has a significant effect on economic growth. Moreover, it seems a single inequality measurement is insufficient to capture the effects of inequality on growth (Voitchovsky, 2005) so this study not only uses the Gini coefficient but also mean log deviation and Theil index. Comparing with the Gini coefficient, those two other measurements have advantages in decomposing the general inequality both within and between classes. Therefore this part explains the effect of income inequality on economic growth for two different income inequality measurements; mean log deviation is presented in Table 2 while Theil index is provided in Table 3.

In general, there is a similar result for both specification tests. Both mean log deviation and Theil index show that model 1 (one- step difference GMM with one lagged dependent variable as a regressor) excluded from the analysis since it violates one of the specification tests. Models 2 to 5 pass the specification test. The AR test results show that the error is not serially correlated (the hypothesis that Δu_it does not have AR(1) can be rejected, and the hypothesis that Δu_it is AR(2) cannot be rejected). Moreover, the Hansen test results present that the instruments are not correlated with the error. The hypothesis of Hansen test that the errors are not correlated with all exogenous variables cannot be rejected. There is a significant increase in the number of instruments in this study from 48 to 89 if system GMM estimator is applied.

Table 2: Estimation Results (Mean Log Deviation)

Variable	1	2	3	4	5
	One-step difference		Two-step diff.	One-step	Two-step
lgrdpcap (L1)	0.8936***	0.7689***	0.9008***	0.9657***	0.9623***
	(0.0466)	(0.0859)	(0.0623)	(0.0123)	(0.0195)
lgrdpcap (L2)		0.0987			
		(0.0863)			
MYS	0.0127*	0.0077	0.0139*	-0.0009	-0.0014
	(0.0064)	(0.0062)	(0.0069)	(0.0037)	(0.0043)
Temp	0.0024	0.0032	0.0027	-0.0005	0.0006
	(0.0023)	(0.0027)	(0.0017)	(0.0014)	(0.0021)
llabor	-0.0211	-0.0743*	0.0124	-0.0230**	-0.0234
	(0.0355)	(0.0434)	(0.0540)	(0.0104)	(0.01563)
popgrowth	-0.7093***	-0.5770***	-0.7170***	-0.7756***	-0.7373***
	(0.1406)	(0.1521)	(0.1851)	(0.0999)	(0.1612)
crimerates	0.0000	-0.0000	-0.0001	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
lgfcf	0.0384**	0.0396	0.0287	0.0278**	0.0289*
	(0.0153)	(0.0259)	(0.0200)	(0.0107)	(0.0148)
cor	-0.0063	-0.0135*	-0.0020	0.0098	0.0082
	(0.0068)	(0.0078)	(0.0107)	(0.0089)	(0.0108)
lgovt	0.0008	0.0011	0.0013	-0.0033	-0.0024
	(0.0008)	(0.0009)	(0.0015)	(0.0040)	(0.0046)
ge_bottom	0.0836	-0.3338	-0.0254	0.5377**	0.5861
	(0.3045)	(0.3181)	(0.3429)	(0.2527)	(0.4662)
ge_middle	-1.330	-1.863	-0.9071	1.864	2.203
	(1.389)	(1.712)	(1.611)	(1.234)	(1.950)
ge_top	-0.0435	0.0806	0.1100	0.373*	0.2687
	(0.1752)	(0.2493)	(0.2995)	(0.1849)	(0.2985)
ge_between	0.2686	0.4104	0.0968	-0.3463	-0.3405
	(0.2729)	(0.4109)	(0.3352)	(0.2490)	(0.3964)
_cons				0.5660***	0.5575**
				(0.1789)	(0.2650)
N	201	176	201	247	247
F-stat	423.74	423.75	310.23	24302.12	12455.97
P-values	0.000	0.000	0.000	0.000	0.000
AR(1)	0.003	0.004	0.007	0.006	0.006
AR(2)	0.098	0.213	0.117	0.182	0.208
Hansen Test	0.931	0.863	0.931	1.000	1.000
Number of instrument	48	43	48	89	89

***p<0.01, **p<0.5, *p<0.1. (Robust standard errors in parantheses)

Table 3. Estimation Results (Theil Index)

Variable	1	2	3	4	5
	One-step difference		Two-step difference	One-step system	Two-step system
lgrdpcap (L1)	0.8957***	0.7800***	0.8944***	0.9644***	0.9692***
	(0.0540)	(0.0901)	(0.0741)	(0.0121)	(0.0168)
lgrdpcap (L2)		0.0913			
		(0.0861)			
MYS	0.0122*	0.0068	0.0104	-0.0011	-0.0006
	(0.0063)	(0.0063)	(0.0101)	(0.0037)	(0.0041)
Temp	0.0020	0.0026	0.0015	-0.0003	0.0004
	(0.0023)	(0.0024)	(0.0030)	(0.0014)	(0.0017)
llabor	-0.0200	-0.0675	-0.0075	-0.0233**	-0.0166
	(0.0367)	(0.0425)	(0.0492)	(0.0101)	(0.0159)
popgrowth	-0.7068***	-0.5805***	-0.6789***	-0.7391***	-0.6810***
	(0.1302)	(0.1454)	(0.2087)	(0.0937)	(0.1417)
crimerates	0.0000	-0.0000	0.0000	0.0000	0.0000*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
lgfcf	0.0381**	0.0353	0.0362	0.0284***	0.0229
	(0.0183)	(0.0288)	(0.0239)	(0.0099)	(0.0144)
cor	-0.0061	-0.0137*	-0.0052	0.0086	0.0054
	(0.0060)	(0.0072)	(0.0082)	(0.0088)	(0.0092)
lgovt	0.0007	0.0013	0.0013	-0.0026	-0.0016
	(0.0008)	(0.0009)	(0.0016)	(0.0038)	(0.0037)
theil_bottom	0.2071	-0.3716	0.3297	0.3646	0.6424
	(0.3540)	(0.3252)	(0.3960)	(0.2544)	(0.4999)
theil_middle	-0.5172	-1.577	0.2964	1.1688	2.4617
	(1.537)	(1.440)	(1.588)	(1.008)	(1.7315)
theil_top	0.0364	0.0722	0.0441	0.1650**	0.1807
	(0.1030)	(0.1336)	(0.1138)	(0.0831)	(0.1115)
theil_between	0.0860	0.3351	-0.0467	-0.1935	-0.4039
	(0.2795)	(0.3213)	(0.2987)	(0.1803)	(0.2941)
_cons				0.5667	0.4337
				(0.1669)	(0.2748)
N	201	176	201	247	247
F-stat	453.31	514.72	226.74	18610.92	11073.06
P-values	0.000	0.000	0.000	0.000	0.000
AR(1)	0.004	0.004	0.007	0.005	0.004
AR(2)	0.081	0.153	0.142	0.176	0.220
Hansen Test	0.914	0.865	0.914	1.000	1.000
Number of instrument	48	43	48	89	89

***$p<0.01$, **$p<0.5$, *$p<0.1$. (Robust standard errors in parantheses)

Overall, from four models, it shows that only one model that had an effect of income inequality on economic growth viz., one-step system GMM. Related to the impact of inequality on economic growth in a different class of population, this study cannot conclude the clear conclusion. It is because of only model 4 (one-step system GMM) that gives statistically significant results for inequality variables. Model 4 generates the positive effect of income inequality on economic growth for the bottom and top classes if using mean log deviation as an income measurement while the positive impact only found in the top category if Theil index applied. The positive effect in the bottom level in this study contrasts with Voitchovsky's findings. It seems there is little evidence that the increasing inequality in the bottom and top classes give a good effect on economic growth. However, the middle class does not provide any significant impact on this study, similar with between classes.

Furthermore, using system GMM is usually expected to increase the efficiency (giving smaller standards errors) compared to the difference GMM and two-step GMM is also more efficient than one-step GMM, however in this study the two-step system GMM does not improve efficiency since one-step system GMM obtains the smallest standard error. Therefore, the effects of inequality on growth within each class are not clear.

Conclusion

The nexus of inequality and economic growth has been studied by many academics for the last three decades and remain interesting to debate due to the variation of the result. However, the study related to this topic still limited in Indonesia. It is essential to investigate the effect of income inequality on economic growth, especially in Indonesia that experiences a high level of income inequality. Moreover, the high level of inequality suspected as the cause of the slowdown of the economic growth.

According to the result, there is evidence of a positive relationship between general income inequality and economic growth in Indonesia during the period 2005-2015. It concludes that increasing inequality does not hamper economic growth; in fact, it leads to higher growth. Considering the second research question, this study cannot draw a definite conclusion about the effect of inequality within the class on economic growth since only one model (one-step system GMM) gives statistically significant results. Moreover, from the one-step system GMM, this paper finds a little evidence that inequality in the bottom and top classes show a positive and significant effect on economic growth. Regarding the positive result of this study, it does not necessarily imply that Indonesia government should increase inequality to achieve higher growth, but it should encourage the policymakers to learn and understand more about the real mechanism between inequality and growth. From the results, if the government wants to increase economic growth, we suggest that they better to focus more on the other factors that have a negative impact on economic growth such as poverty and crime. However, if the government believes that the inequality problem is urgent to be solved, and then they have to put aside economic growth agenda.

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