

# Economic Growth and Income Inequality in ASEAN-5 Countries

Yola Mairina Sari<sup>1</sup>, Aliasuddin<sup>1\*</sup>, Vivi Silvia<sup>1</sup>

<sup>1</sup> Faculty of Economics and Bussines, Syiah Kuala University, Banda Aceh, Indonesia

\*Corresponding Author: [aliasuddin@unsyiah.ac.id](mailto:aliasuddin@unsyiah.ac.id)

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**Abstract:** *This study aims to analyze the effect of economic growth, inflation, and expenditure on income in ASEAN-5 by using the ARDL panel analysis model. The data panel in this study is from 1985-2019 and covers five countries for 175 observations. The results of this study indicate that in the long-run economic growth and inflation harm income while government spending is positive with concerns. Meanwhile, economic growth, inflation, and government spending are positive with concerns in the short term. This study recommends that the government focus on standard policies rather than selective for poor areas in each country, improve employee performance, implement education reforms, and support tax efficiency and governance in general. If this policy is implemented correctly, it will not burden public finances in the long term, so that it will have a positive impact.*

**Keywords:** Gini ratio, GDP, Inflation, Government expenditure, ARDL

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## 1. Introduction

Paus (2017) said that high innovation could undermine productivity and education. Unequal education will damage the process of human capital accumulation, resulting in low productivity and an impact on the decline in economic growth. Government spending on education is generally considered a social transfer (Kim, 2016). Spending on education is one way to invest in the quality of human resources. Many emerging economies in the ASEAN-5 (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) find a skilled workforce essential in building and modernizing economies. The number of workers helping to address needs in the labor market (Anderson et al. 2016).

In developing countries with a concentration of middle-income groups, the redistribution of government spending does not extend to the entire income distribution; when the government reduces government spending in terms of general social spending, which includes health and education, inequality increases. However, when the government increases military spending, inequality increases (Anderson et al., 2016). This result shows that government spending on income inequality can vary between countries depending on the type of government spending (Johansson et al., 2016).

In addition, inflation also plays a role in inequality. Lisani et al. (2020) found that an increase in aggregate output did not accompany high inflation rates in lower-middle-income countries in ASEAN. Therefore, the supply of more job opportunities to reduce unemployment through increased inflation is not possible. In the end, a high inflation rate causes the unemployment rate to increase. When unemployment increases, income inequality will increase (Hindun et al. 2019).

High inflation rates cause investment to be riskier because it is more difficult to anticipate future interest rates and nominal wage growth rates (Hassouneh in Lisani et al. 2020). Changes in the minimum wage increase will cause a decrease in the absorption of labor because the company cannot pay workers' wages due to an increase in production costs (Pratama et al., 2020).

Namini & Hudson (2019) support the results of the inverted U-shaped Kuznets between inflation and income inequality. Real industrial value-added per capita, which is indicated by the value-added of actual per capita services, shows a nonlinear relationship between aggregate inflation and income inequality. The value-added of accurate per capita services leads to an increase in income inequality. The service sector employs more workers in urban areas than rural areas. This sector has a high contribution to inflation and GDP, thus increasing income inequality. Because the previous research literature shows differences in the long-term and short-term impacts of overall financial development on inequality using quarterly data from one country. This study practically shows how the influence of economic growth, inflation, and government spending on inequality is based on panel data cross-section and time series from several ASEAN countries. This case-specific coefficient has not yet been included for ASEAN-5, so this research is fundamental. This research will fill in gaps in empirical studies that rely on cross-sectional regression analysis. These findings have important policy implications and lessons for ASEAN-5.

## 2. Literature Review

Brida et al. (2020) find that economic growth in developing countries is enhanced by income inequality in the short term. In addition, there is an inverse U-shaped relationship between inequality and economic growth. Destek et al. (2020) say that an increase in real income and government spending reduces income inequality. In the short term, inflation has a positive effect on income inequality, while in the long term, an increase in real income per capita and government spending has a negative effect on income inequality. This result is in line with Kuznet's hypothesis that there is an inverse U-shaped relationship between the overall financial development index and income inequality in the long run.

A study conducted by Chu et al. (2019) found that inflation only affects income inequality through the effect of interest rates in a cashless economy and not through the effect of asset values. Therefore, inflation that hinders economic growth can reduce income inequality. At the same time, Lisani et al. (2020) said that, in general, countries with lower middle incomes have higher inflation rates than high-income countries. Inflation will reduce inequality in ASEAN developing countries. An increase in inflation will reduce inequality when inflation is below the inflation threshold value (Balciliar et al., 2017).

In contrast to Munir & Sultan (2017), they do not observe a significant relationship between inflation and income inequality. However, they found a positive relationship between GDP per capita and income inequality, implying both countries are at an early stage of development, suggesting that income inequality will increase as economic growth increases.

Azam & Raza (2018) found that inflation has a positive and significant effect on income inequality in ASEAN-5 countries (Malaysia, Singapore, Thailand, Indonesia & the Philippines). Meanwhile, using the pooled OLS test, GDP has a negative effect on income

inequality. This finding confirms the existence of the Kuznets financial hypothesis in ASEAN countries.

The findings of Kavya & Shijin (2020) explain that inflation has a negative effect on inequality in middle-income countries and has a positive effect on high-income countries. Meanwhile, economic growth has a positive effect on income inequality in middle-income countries and has a negative effect on high-income countries. This result is different from Kuznet's hypothesis that economic growth positively affects income inequality in developing countries, namely following a curve pattern with a U shape. In contrast, in developed countries, it follows an inverted U shape.

### 3. Methodology

The panel data used in this study is secondary data in the form of annual data from the period 1985 to 2019 with a total of 35 years so that all panel data are 175 samples consisting of five selected ASEAN countries, namely: Indonesia, Malaysia, Thailand, the Philippines, and Vietnam. Data were obtained from several sources, namely the World Bank database, the World Income Inequality Database (WIID). This study shows from the Gini ratio, which is stated on a scale of 0 to 1, where the income value increases ideally, and one reflects perfectly. Economic growth is measured by real Gross Domestic Product (GDP) expressed in percent. The consumer price index measures inflation. Government spending is measured by the ratio of government spending divided by GDP expressed in percent. Thus, this study proposes Autoregressive Distributed Lag (ARDL) as follows:

$$\Delta \ln GR_{j,t} = \alpha_{0i} + \sum_{i=1}^n \alpha_{1i} \Delta \ln GR_{i,t-1} + \sum_{i=1}^n \alpha_{2i} \Delta \ln EG_{i,t-1} + \sum_{i=1}^n \alpha_{3i} \Delta \ln INF_{i,t-1} + \sum_{i=1}^n \alpha_{4i} \Delta \ln GE_{i,t-1} + \beta_{11} \ln GR_{j,t-1} + \beta_{21} \ln EG_{j,t-1} + \beta_{31} \ln INF_{j,t-1} + \beta_{41} \ln GE_{j,t-1} + u_{j,t} \dots\dots\dots(1)$$

Where *GR* is income inequality, *EG* is economic growth, *INF* is inflation, and *GE* is government spending,  $\alpha_1, \alpha_2, \alpha_3,$  dan  $\alpha_4$  represent the short-term dynamics of the model. In contrast,  $\beta_1, \beta_2, \beta_3,$  dan  $\beta_4$  represent long-term relationships in the study.  $\Delta$  represents the difference between two values of a variable in successive periods. Furthermore, *t* is the year, i.e., 1985-2019, *j* is the five countries in ASEAN, *i* is the order of lag, and *u* is the *error term* that is normally distributed.

### 4. Findings and Discussion

#### 4.1 Panel Stationarity Results Test

The mandatory requirement before completing the ARDL panel model estimation is to perform a Stationarity test. Stationarity test results are depicted in Table 1. Stationarity testing in this study uses four approaches, including LLC, IPS, ADF-Fisher, and PP-Fisher, with individual intercepts and individual intercepts and trends. Table 1 explains that each variable has different stationarity at the level (I(0)) or the first difference (I(1)). Because there are differences in stationarity, the ARDL panel is feasible to use in this study. Table 1. Panel Unit Root of Variables.

**Table 1: Unit Root Test of the Variables**

Individual Intercept				
	LLC	IPS	ADF-Fisher	PP-Fisher
EG	-2.906	-4.710	41.373	59.539
	(0.001)	(0.000)	(0.000)	(0.000)
INF	-0.656	-2.726	24.974	56.369
	(0.255)	(0.003)	(0.005)	(0.000)
GE	-0.917	-1.363	16.019	11.091
	(0.179)	(0.086)	(0.099)	(0.350)
GR	-2.034	-1.568	25.405	5.219
	(0.020)	(0.058)	(0.004)	(0.876)
$\Delta$ EG	-7.084	-10.541	103.445	127.976
	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta$ INF	-7.117	-11.764	112.722	146.097
	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta$ GE	-3.960	-5.763	52.050	84.865
	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta$ GR	-8.549	-7.897	74.709	47.465
	(0.000)	(0.000)	(0.000)	(0.000)
Individual Intercept and Trend				
EG	-2.033	-4.420	37.095	51.344
	(0.021)	(0.000)	(0.000)	(0.000)
INF	-1.110	-3.747	32.430	55.173
	(0.133)	(0.000)	(0.000)	(0.000)
GE	-1.746	-2.109	21.557	14.620
	(0.040)	(0.017)	(0.017)	(0.146)
GR	-3.450	-2.564	25.163	4.547
	(0.000)	(0.005)	(0.005)	(0.919)
$\Delta$ EG	-4.984	-9.373	83.682	627.615
	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta$ INF	-5.265	-10.865	108.005	497.931
	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta$ GE	-2.754	-4.171	35.686	72.456
	(0.002)	(0.000)	(0.000)	(0.000)
$\Delta$ GR	-8.157	-7.458	68.077	37.393
	(0.000)	(0.000)	(0.000)	(0.000)

Source: Estimated Results, 2021

#### 4.2 Panel Cointegration Results Test

The cointegration test in this study using Panel Cointegration with Pedroni and KAO Based which aims to see several integrated variables on different I(0) or I(1) orders. The results of the panel cointegration test between EG, INF, GE, and GR with a significance of 5 and 1 percent, concluded that there was a short-term to a long-term relationship between the four variables.

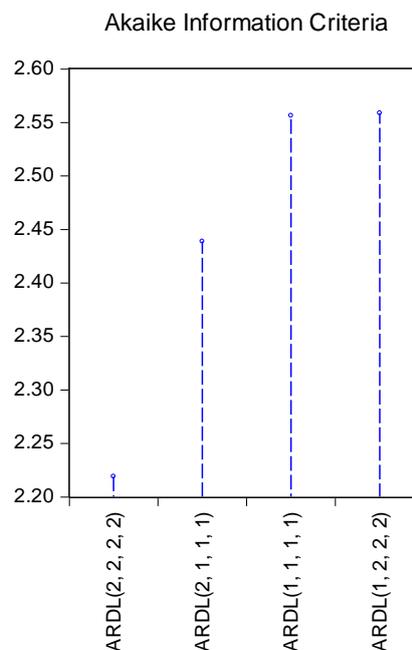
**Table 2: Panel Unit Root of Variables**

Predoni Cointegration Test	Statistic	Weighted Statistic
Panel v-Statistic	-0.983 (0.837)	-2.119 (0.983)
Panel rho-Statistic	1.830 (0.966)	2.543 (0.994)
Panel PP-Statistic	1.281 (0.900)	1.924 (0.972)
Panel ADF-Statistic	-0.057 (0.477)	-3.644 (0.000)
Group rho-Statistic	2.561 (0.994)	
Group PP-Statistic	1.759 (0.960)	
Group ADF-Statistic	-0.929 (0.176)	
<b>KAO Cointegration Test</b>		
	t-statistic	
ADF	-1.432 (0.076)	

Source: Estimated Results, 2021

### 4.3 Lag Selection

This study uses a lag test with the Akaike Information Criterion (AIC) to see the lowest value and explain the optimal lag. Suppose you have obtained the optimal lag with the AIC criteria and get two lag results. The best lag selection is by looking at the AIC value so that the appropriate lag used in this study is 2.2.



### Discussion

The ARDL panel regression results have met the requirements because the error correction coefficient is negative and significant. For this reason, it can be used as a model for analyzing the influence of economic growth, inflation, and expenditure on the income of ASEAN-5 countries (Indonesia, Malaysia, Philippines, Thailand, Vietnam) as in Table 3. The ECT-1 coefficient is 33 that when a shock occurs, it takes 33 days to return to the initial position, or 33 days of the speed of adjustment are required to achieve balance again. Table 3 explains that economic growth affects long-term and short-term income received. The long-term EG coefficient is smaller (-0.081) compared to the short-term. This condition illustrates that economic growth has a more negligible effect in the long term than in the short term. There is

an actual increase in per capita income in the long term, which will reduce income (Destek et al., 2020).

Meanwhile, Gordon & Resosudarmo (2018) find that the result is not statistically significant. Even though economic growth has increased, equitable social welfare has not been fully achieved (Anderson et al. 2016 and Berisha et al. 2019). With Younsi et al. (2019) research, ASEAN-5 countries cannot reduce income related to the economy alone. Still, policies and strategies are implemented to reduce differences in views from one country to another that also have an effect. The government can reduce through investment in human resources and improve education for the poor (Park & Shin, 2017). Nazipawati (2019) also said that the higher the level of economic growth of a region, the lower expectations.

Furthermore, this study documented inflation has a negative and significant relationship with income inequality in the long run. This shows that an increase in inflation of 1 percent led to a decrease in inequality of -0.177 percent. This implies that when macroeconomic stability is improved by reducing inflation in ASEAN-5 countries, foreign aid becomes more effective in reducing income inequality (Younsi et al., 2019). However, the effect of inflation on income inequality is positive in the short term. Inflation can increase inequality when low-income households hold more cash (portfolio) as part of their total purchases (portfolio). If wages, pension funds, and transfers to low-income households are not indexed to inflation, they will not guarantee the rate of return for low-income households to increase when inflation occurs (Erosa; Cardoso and Pessino in Binders, 2019).

Government spending has a negative effect on income in the short run. When the government increases government spending by 1 percent, it will decrease income by -0.312 percent. However, statistically, this relationship is weak, but as the government contest, it is an essential public policy factor in dealing with ASEAN-5. This research is supported by the research of Destek et al. (2020), Ho et al. (2020), and Fournier & Johansen (2016). Fiscal spending is known to have a direct influence on the outlook as measured by the Gini ratio. Subsidies and social transfers and public health spending, for example, have a more significant direct effect on reducing income. In addition, the government can also reduce to increase the size of the expenditure program, which may be more significant to reduce (Fournier & Johansen, 2016).

**Table 3: Panel Unit Root of Variables**

Estimate	Variable	Coefficient	t-Statistic
<i>(Long Run)</i>	EG	-0.081465	-0.215923 (0.8295)
	INF	-0.177102	-1.849079 (0.0675)
	GE	2.035988	3.547364 (0.0006)
<i>(Short Run)</i>	C	2.105274	2.310058 (0.0230)
	$\Delta(EG)$	0.131011	2.342898 (0.0212)
	$\Delta(EG(-1))$	0.008817	0.103999 (0.9174)
	$\Delta(GE)$	0.144634	0.722072 (0.4720)
	$\Delta(GE(-1))$	-0.312912	-1.351068 (0.1798)
	$\Delta(INF)$	0.081768	1.959677 (0.0529)
	$\Delta(INF(-1))$	0.049138	1.477557 (0.1428)
	$ECT(-1)$	-0.092546	-2.284782 (0.0245)

Source: Estimated Results, 2021

Table 4 explains that the effect of the independent variables for the Indonesian case is only two variables that are not significant. These two variables were not analyzed, while the variables described were following the estimation results. The Gini coefficient in the previous year, marked by 0.136, had a positive and significant effect on inequality in the short term. This illustrates that in the short term, there will be an increase in inequality. The same thing is shown by short-term economic growth. An increase in economic growth will result in increased income inequality. Similar results are also shown by short-term inflation with a coefficient of 0.1538 with a significance level of 0.000 that when inflation increases, inequality will also increase (Azam & Raza, 2018; Destek et al. 2020; Binder et al. 2019 and Berisha et al. 2019).

**Table 4. Cross Section Shorts-Run Coefficients of Indonesia**

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.233339	0.009216	-25.31809	0.0001
D(GR(-1))	0.136000	0.019581	6.945609	0.0061
D(EG)	0.318720	0.012695	25.10670	0.0001
D(EG(-1))	0.313637	0.021926	14.30435	0.0007
D(GE)	-0.293647	0.194257	-1.511643	0.2278
D(GE(-1))	0.187292	0.205149	0.912958	0.4286
D(INF)	0.153865	0.001756	87.61719	0.0000
D(INF(-1))	0.153990	0.002935	52.47254	0.0000
C	4.985167	4.420681	1.127692	0.3415

Source: Estimated Results, 2021

Table 5 explains that for the case in Malaysia, all variables have a significant influence. A single variable is not analyzed, while the variables described following the estimation results. The Gini coefficient of the previous year, which was marked by 0.483, had a positive and significant effect on inequality in the short term. This illustrates that in the short term, there will be an increase in inequality. The same thing is shown by short-term economic growth with a coefficient of 0.003 that an increase in economic growth will result in increased income inequality (Jauch & Watzka, 2015; Chang et al. 2017; Park & Shin, 2017; Berisha et al. 2019). Similar results are also shown by the previous year's inflation coefficient of 0.061 with a significance level of 0.000 that when inflation increases, inequality will also increase (Binder et al. 2019; Destek et al. 2020; Azam & Raza, 2020 and Berisha et al. 2019). Inflation will increase inequality to offset the redistribution of government spending financed through monetary expansion (Anderson et al. 2016).

**Table 5: Cross Section Shorts-Run Coefficients of Malaysia**

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.015992	0.000348	-46.01123	0.0000
D(GR(-1))	0.483410	0.023280	20.76496	0.0002
D(EG)	0.003033	0.000356	8.516091	0.0034
D(EG(-1))	-0.002321	0.000339	-6.855182	0.0064
D(GE)	-0.330580	0.015261	-21.66205	0.0002
D(GE(-1))	-0.156518	0.017480	-8.954066	0.0029
D(INF)	-0.037751	0.003106	-12.15268	0.0012
D(INF(-1))	0.061421	0.003408	18.02392	0.0004
C	0.231991	0.190342	1.218811	0.3100

Source: Estimated Results, 2021

Table 6 explains that for the case in the Philippines, all variables have a significant effect. A single variable is not analyzed, while the variables described following the estimation results.

The Gini coefficient in the previous year with a coefficient of 0.339 had a positive and significant effect on inequality in the short term. This explains that in the short term, there will be an increase in inequality. The same thing is also shown by economic growth and government spending in the short term. An increase in economic growth and increased government spending will lead to an increase in inequality. The same result is shown by short-term inflation with a coefficient of 0.122 with a significance level of 0.000 that when inflation increases, inequality will also increase. This finding is following the research of Jauch & Watzka (2015), Chang et al. (2017); Park & Shin (2017); Berisha et al. (2019); Binder et al. (2019); Destek et al. (2020), and Azam & Raza (2020) which indicate that inflation may be beneficial to some extent but can exacerbate inequality at a higher level.

**Table 6: Cross Section Shorts-Run Coefficients of Philippine**

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.103446	0.002300	-44.97968	0.0000
D(GR(-1))	0.339078	0.031065	10.91502	0.0016
D(EG)	0.079088	0.003795	20.84069	0.0002
D(EG(-1))	0.018276	0.002540	7.196689	0.0055
D(GE)	0.273633	0.038527	7.102442	0.0057
D(GE(-1))	-0.322072	0.042640	-7.553206	0.0048
D(INF)	0.122964	0.001650	74.52292	0.0000
D(INF(-1))	0.065515	0.001622	40.38600	0.0000
C	2.725388	2.517159	1.082724	0.3582

Source: Estimated Results, 2021

Table 7 explains that for the case in Thailand, only one variable has an insignificant effect, while the variables described are following the estimation results. The Gini coefficient the previous year with 0.3243 had a positive and significant effect on inequality in the short term. This explains that in the short term, there will be an increase in inequality. The same thing is shown by economic growth and government spending in the short term. Increased economic growth and increased government spending will increase inequality (Chang et al., 2017; Jauch & Watzka, 2015; Park & Shin, 2017 and Berisha et al., 2019). Whereas economic growth has not fully increased the community's welfare, there is still unemployment and government assistance in social transfers, and grants have not been fully targeted. Similar results are also shown by short-term inflation with a coefficient of 0.122 with a significance level of 0.000 that when inflation increases, inequality will also increase. This finding is in line with Balciliar et al. (2018), who indicated that inflation would be beneficial to some extent but could exacerbate inequality at a higher level.

**Table 7: Cross Section Shorts-Run Coefficients of Thailand**

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.009213	0.000478	-19.28730	0.0003
D(GR(-1))	0.324353	0.032454	9.994337	0.0021
D(EG)	0.191126	0.004991	38.29346	0.0000
D(EG(-1))	-0.094469	0.003028	-31.20281	0.0001
D(GE)	0.710314	0.381704	1.860904	0.1597
D(GE(-1))	-1.179066	0.289291	-4.075703	0.0267
D(INF)	0.167403	0.015102	11.08449	0.0016
D(INF(-1))	-0.047564	0.011297	-4.210382	0.0245
C	0.046804	0.132660	0.352815	0.7476

Source: Estimated Results, 2021

Table 8 describes the case in Vietnam, and there is only one variable has an insignificant effect, while the variables described are following the estimation results. The Gini ratio of the previous year with a coefficient of 0.576 has a positive and significant effect on inequality in the short term. In the short term, there will be an increase in income inequality. The same thing is shown by economic growth, government spending, and inflation in the short term. An increase in economic growth, government spending, and inflation will cause an increase in inequality. These results are shown by the coefficient of short-term economic growth of 0.063, the coefficient of short-term government spending of 0.363, and the coefficient of short-term inflation of 0.122 with all significance levels of 0.000 that inequality will also increase when inflation increases. These facts were in harmony with the findings by Jauch & Watzka (2015) for Germany, Destek et al. (2020) for Turkey, Younsi et al. (2019) for Tunisia, and Azam & Raza (2018) for Malaysia.

**Table 8: Cross Section Shorts-Run Coefficients of Vietnam**

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COINTEQ01	-0.100740	0.003477	-28.96930	0.0001
D(GR(-1))	0.576169	0.022187	25.96883	0.0001
D(EG)	0.063085	0.017166	3.675084	0.0349
D(EG(-1))	-0.191041	0.013691	-13.95360	0.0008
D(GE)	0.363448	0.131965	2.754125	0.0705
D(GE(-1))	-0.094198	0.110602	-0.851686	0.4570
D(INF)	0.002357	0.000581	4.057928	0.0270
D(INF(-1))	0.012327	0.000550	22.42952	0.0002
C	2.537018	2.211959	1.146955	0.3346

Source: Estimated Results, 2021

## Conclusion

This study analyzes economic growth, inflation, and government spending on income inequality from 1985-2019 in selected ASEAN-5 countries, namely Indonesia, Malaysia, Philippines, Thailand, and Vietnam. The first empirical finding reveals that low-income groups benefit more than high-income groups from an increase in prosperity due to increased economic growth. The second finding shows that an increase in government spending will reduce inequality if government distributive spending such as spending on social protection, health, housing and community, facilities, and education can be increased to succeed in reducing income inequality in ASEAN-5 countries. In addition, the study results show that the positive impact of inflation on income inequality holds well in the short term.

Most studies conclude that inequality negatively affects growth in the long run and positive in the short term. The government must continue to pursue reforms, although the results will appear later. As documented, the regional aspect of income inequality in ASEAN-5 is more dominant but not as dominant as is usually assumed. Thus, the government should focus on standard tasks than selective for poor areas of each country, strengthen the bureaucracy, implement education reforms, support tax efficiency, and public governance in general. If this policy is implemented correctly, it will not burden public finances in the long term, so that it will have a positive impact.

Most aid organizations contribute to the reduction of global poverty and inequality. Increasing foreign aid is related to reducing inequality. Therefore there is a need for good coordination

and control in the flow of aid by a country/organization, one of which is reviewing methods and strategies in providing foreign aid.

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