



## THE EFFECT OF GOVERNMENT EXPENDITURE ON INCOME INEQUALITY AND POVERTY IN INDONESIA

Alamanda

<sup>1</sup>Universitas Indonesia

<sup>2</sup>International Institute of Social Studies, Erasmus University  
alamanda.djp@gmail.com

### ARTICLE INFO

**First Received:**

[20 November 2019]

**Revised:**

[20 February 2020]

**Accepted:**

[04 March 2020]

**Keywords:**

income inequality; poverty; infrastructure; social aid; subsidy; grant

### ABSTRACT

*Income inequality and poverty have become key issues in development studies since the 1970s. Although theoretically there are various factors associated with the incidence of poverty and income inequality, choices regarding the types and structure of government expenditure are often quoted as one of the crucial determinants. However, the evidence is still inconclusive, and the research about these issues in the case of Indonesia is still minimum. This paper tries to contribute to the discussion by analysing a panel data set of 33 provinces from 2005 to 2017 to examine the effect of different types of government expenditure on income inequality and poverty in Indonesia. Using the fixed effect, random effect, and Seemingly Unrelated Regression (SURE) system, this paper finds that social aid, subsidy and grant expenditure have an insignificant effect on reducing income inequality and poverty in Indonesia. However, the empirical evidence suggests that infrastructure spending has a negative correlation with income inequality in urban areas (when using the random effect model), and rural areas (when using the fixed effect model). In addition, infrastructure expenditure is also negatively and significantly correlated with poverty in Indonesia, and the impact is more significant in rural than urban areas.*

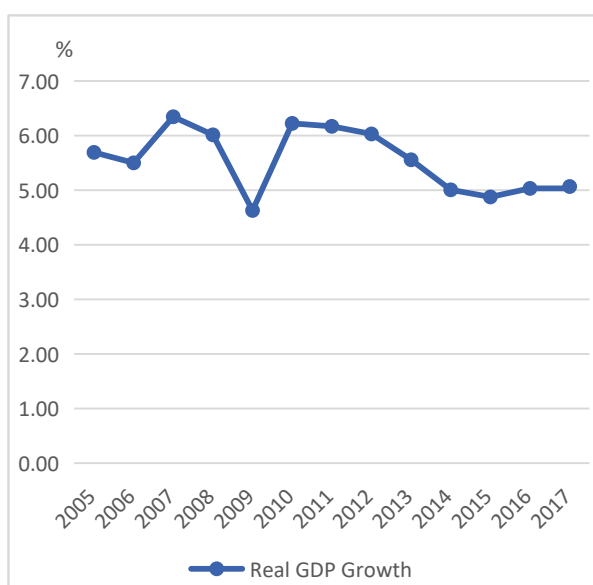
Ketimpangan pendapatan dan kemiskinan telah menjadi permasalahan utama dalam studi pembangunan sejak tahun 1970-an. Meskipun ada berbagai faktor yang secara teoritis terkait dengan insiden kemiskinan dan ketimpangan pendapatan, pilihan mengenai jenis dan struktur pengeluaran pemerintah sering dikutip sebagai salah satu faktor penentu penting. Namun, bukti ilmiah atas permasalahan ini masih belum bisa disimpulkan, dan penelitian atas topik tersebut di Indonesia masih sangat sedikit. Penelitian ini mencoba untuk berkontribusi dengan memanfaatkan data panel 33 propinsi dari tahun 2005 sampai dengan 2017 untuk menguji pengaruh berbagai jenis pengeluaran pemerintah terhadap ketimpangan pendapatan dan kemiskinan di Indonesia. Dengan menggunakan fixed effect, random effect, dan Seemingly Unrelated Regression (SURE) sistem, penelitian ini menemukan bahwa bantuan sosial, subsidi dan pengeluaran hibah tidak berdampak secara signifikan dalam mengurangi ketimpangan pendapatan dan kemiskinan di Indonesia. Namun, bukti empiris menunjukkan bahwa pengeluaran infrastruktur memiliki korelasi negatif dengan ketimpangan pendapatan di daerah perkotaan (ketika menggunakan random effect model), dan daerah pedesaan (ketika menggunakan fixed effect model). Selain itu, pengeluaran infrastruktur juga berkorelasi negatif dan signifikan dengan kemiskinan di Indonesia, dan dampaknya lebih signifikan di daerah pedesaan daripada perkotaan.

## 1. INTRODUCTION

The battle between the rich and the poor has existed as long as human history. However, nowadays, there is more focus on the poverty issue and distribution of wealth from the rich to the poor. A great number of authors in literature have discussed the inequality and poverty issues since the 1970s, making it one of the major fields in development studies (Ahluwalia 1976; Fields 1980; Kakwani 1980). Indonesia, as a developing economy, also faces the problem of inequality and poverty. According to Oxfam Indonesia and the International NGO Forum on Indonesian Development (2017), there are two astonishing facts regarding income inequality problem in Indonesia. First, the four wealthiest men in Indonesia are worth as much as 100 million poorest citizens. Second, Indonesia's Gini index has fallen slower than any Southeast Asia countries in the last two decades. It indicates that there is a problem regarding income distribution in this country.

On the other hand, the economy of Indonesia has expanded fast in the 2000s and 2010s. Figure 1 illustrates the trends in real GDP growth rate of Indonesia from 2005 to 2017. It can be observed from the graph that Indonesia's economy has performed very well with the average annual real GDP growth of approximately 5.55% (The World Bank Data 2019), making Indonesia as one of the fastest-growing economies in Asia and the sixteenth biggest economy in the world by nominal GDP. However, the benefits of the growth have not been shared equally and left millions of people behind. There are 25 million Indonesian people who still live below the poverty line (the Statistics Bureau of Indonesia 2019). It suggests that an increase in GDP growth does not necessarily give a positive impact on poverty and income inequality.

Figure 1. Real GDP Growth in Indonesia



Source: The World Bank Data (2019)

Since income inequality and poverty have become major global issues, there has been considerable interest in what government can do to reduce it. Even though the evidence is still inconclusive, many scholars claim that one of the important tools to decrease income inequality and poverty rate is through government expenditure (Anderson 2017: 961). However, there is still an outgoing debate about the effect of government expenditure on income inequality and poverty. Some economists believe that particular types of government expenditure could reduce income inequality and poverty (Anderson et al. 2017; Ogun 2010; Sylwester 2002). In contrast, Cozzy and Impullitti (2008: 20) concluded that the US government spending policy contributes to an increase in wage inequality in the late 1970s and 1980s. In those periods, the US government shifted its focus on public spending to stimulate research and development; thus, it increased the wage of skilled workers, while the wage of unskilled labour remained the same. Ultimately, it aggravated the wage inequality in the US. Meanwhile, other scholars argue that government expenditure has no significant impact on reducing poverty and income inequality (Habibov and Fan 2006; Ospina 2010; Permadi 2018).

Based on the description above, the impact of government expenditure on income inequality and poverty is still ambiguous. This is due to a few reasons. First, it depends on the data sample used in the research. A study using cross-countries panel data could have different results with research using national data. Similarly, studies using data from developed and developing countries could have a different outcome as well. Moreover, the characteristic of government spending could affect the results.

Despite the inconclusive evidence, research about this issue in the case of Indonesia is still minimum, especially at the province level. Moreover, as far as the author knows, research has yet to be done regarding the difference between the effect of government spending on income inequality and poverty in urban and rural areas. Therefore, this research tries to contribute to the literature not only by examining the effect of government expenditure on income inequality and poverty using panel data analysis from 33 provinces in Indonesia, but also by differentiating the impact between urban and rural areas. In addition, the novelty of this research also lies in the comparison of the results between three different regression models: the fixed effect, the random effect, and the Seemingly Unrelated Regression (SURE) models.

## 2. THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

This section explains the theoretical framework and empirical evidence of the determinants of inequality and poverty. The determinants of inequality and poverty in this section are divided into four sub-

sections. The first sub-section presents the Keynesian theory regarding the role of government as a main theoretical concept on addressing income inequality and poverty issues. The next sub-section will disaggregate the government's role into three types of government interventions: infrastructure expenditure, social aid expenditure, and subsidy-grant expenditure.

### 2.1. Keynesian Theory

One of the theories that tie income inequality, poverty, and government expenditure is the Keynesian theory of employment, interest, and money. Keynes' theory is relevant because of its concern about the government's role in the economy. According to Stack (1978: 882), "Keynes' theory offers an explanation for the variation in employment and economic growth rates; these, in turn, can be applied to the problem of income inequality (the greater the employment and growth rate, the less the inequality)".

In Keynesian theory, the government could enhance the probability of achieving the fundamental goal of equilibrium between saving, consumption, and investment. The employment level, which is an essential factor in measuring the degree of income inequality, depends on good and service demands. Stack (1978: 882) stated that "demand is a function of the relative propensity to consume and the propensity to save. If the amount of money saved by income recipients is greater than the amount required by those who are responsible for investment, then total demand will be insufficient to sustain full employment". Hence, too much saving is not good for the economy because it lowers job creation and creates unemployment problem that leads to higher income inequality level (Stack 1978: 882).

The government can design policies to balance savings, consumption, and investment. Such government policies include government expenditure, such as social security programmes, subsidies, and welfare expenditure that could affect low-income households. Moreover, the government's ability to create a job through such means as public work projects and government ownership industry also could decrease the unemployment rate and eventually will reduce the income inequality (Stack 1978: 882-883). In addition, Stack (1978: 883) suggested that government involvement through job creation programmes could have a **multiplier effect**. A job creation programme creates not only more productivity, but also more money that could be reinvested both in public or private sectors.

Therefore, the theory suggests that government involvement in the economy could reduce income inequality and poverty through three paths. First, particular types of government expenditure could ease the constraints and improve the living standard of low-income households. Second, the more job creation

through public work projects, the less unemployment and the lower inequality and poverty level. Third, the multiplier effects of job creation programmes could lead to an increase in economic activities and multiple reinvestments.

The impact of such government expenditure, job creation, and the multiplier effect contribute to the economic growth rate. "This, in turn, fosters a climate favouring income redistribution since the affluent can reduce their relative share of the income while at the same time increase the absolute amount of real income" (Stack 1978: 882-883).

### 2.2. Theoretical Framework on Infrastructure Expenditure

There are various factors theoretically associated with the incidence of poverty and inequality. One of them is public infrastructure spending, such as healthcare and public education infrastructure expenditure. People with poor health status cannot perform well in life, thus affects their welfare negatively. Meanwhile, a healthy person tends to have higher human capital and productivity than a poor health one. Since health status is strongly associated with the welfare of the households (Castro-Leal 1999: 29); therefore, an increase in the health of the workforce and infrastructure spending is negatively correlated with the poverty level.

Regarding public education expenditure, there is a general presumption that this type of government expenditure could reduce inequality and poverty problems. When the government devotes more fund to education, it increases the school enrolment rates of low-income people since education becomes more affordable (Lokshin and Yemtsov 2005: 329). Eventually, a better education leads to higher human capital, and increasing the human capital of low-income people is one of the solutions to reduce income inequality and poverty.

In addition to the healthcare and school infrastructures, investment in construction such as roads and bridges could also affect inequality and poverty. According to Lokshin and Yemtsov (2005: 329), bridges and roads rehabilitation projects in rural areas would raise the level of economic activities, increase the number of small and medium enterprises, and improve the access for emergency medical assistance. Higher economic activities and easier access to other cities and medical assistance will cause a drop in the cost of goods and services, and eventually leads to poverty and inequality reduction.

Drawing from this theory, this paper tries to examine whether or not public infrastructure expenditure has an effect on income inequality and poverty. The following hypothesis is made regarding public infrastructure expenditure:

*“The higher the amount of infrastructure expenditure, the lower the level of income inequality and poverty.”*

### **2.3. Theoretical Framework on Social Aid Expenditure**

Social aid expenditure is potentially an essential tool for poverty eradication and income inequality reduction. Social aid expenditure is given by the government in the form of money transfers, goods, or services to poor people to protect them from the possibility of social risks and to improve their welfare. Even though social aid expenditure in the form of transfers can be given conditionally or unconditionally, the studies show that a conditional transfer tends to have a more significant impact than an unconditional transfer (Akresh et al. 2016; Baird et al. 2014; Robertson et al. 2013). According to Fernald et al. (2008), families enrolled in a conditional cash transfer programmes should fulfil certain conditions first such as the minimum requirement for health, nutrition, or education before they get the transfer. The conditional cash transfer is likely to have a result of better outcomes in child health, growth, and development; thus, it increases children’s human capital and stops the lifelong poverty transmission to children. However, it seems worth to note that not only families should fulfil specific requirements first before accepting the transfer, but also it is crucial to monitor how and where the transfer is spent.

Furthermore, “cash transfer may have persistent effects on chronic poverty if they ease liquidity constraints that inhibit the poor from investing in productive activities which generate multipliers on the cash received” (Farrington and Slater 2006; Lloyd-Sherlock 2006). Therefore, cash transfer is likely to improve the living standard of the poor people not only by fulfilling their basic needs that are useful for human capital development, but also giving a chance for low-income groups to invest in productive activities. This leads to the following hypothesis:

*“The higher the amount of social aid expenditure, the lower the level of income inequality and poverty.”*

### **2.4. Theoretical Framework on Subsidy and Grant Expenditure**

Another factor that has been theorized to be correlated with income inequality and poverty is subsidy and grant expenditure. The government could give subsidy and grant to specific companies/organizations as a support to reduce their cost of production. For example, the government provides subsidies for water and electricity companies, so that the selling price of those essential services can be more affordable for society. Other subsidies might be given to schools or hospitals to provide free (or lower cost) education and

medical services for poor people.

Subsidies for basic needs such as water and electricity are crucial for low-income households. By increasing subsidies in those sectors, low-income households could get more access to clean water and electricity. Clean water is one of the requirements for good health, while electricity could improve productivity. As a result, it could improve the living standard of low-income households (Wokodala et al. 2010).

With regard to subsidies on education, most would argue that education benefits provided by the government are most appreciated by families with children. Education subsidies will help poor households to get a better education for their children, so they could have a better job opportunity in the future and stop the lifelong poverty transmission in their families. Meanwhile, health subsidies seem to have a more significant impact on households with the elderly since older citizens are more likely to benefit from medical services (Smeeding et al. 1993: 253-254). Based on these theories, the following hypothesis is formulated:

*“The higher the amount of subsidy and grant expenditure, the lower the level of income inequality and poverty.”*

## **3. METHODOLOGY**

The present section corresponds to the methodology and the identification strategy to address the research questions. It includes a description of the data, summary statistics, econometric model, and panel data model selection.

### **3.1. Data Sources**

This paper uses a panel data set of 33 provinces in Indonesia from 2005 to 2017. The data used for this study are secondary data from several sources. Gross Regional Product and government expenditure are acquired from Gross Regional Domestic Product of Province in Indonesia by Expenditure (2019) and Financial Statistics of Province Governance (2019), respectively. Meanwhile, data for Gini index, poverty rate, unemployment rate, and years of education are obtained from the Statistics Bureau of Indonesia (2019). Regarding the total population in each province, the data are acquired from the World Bank Data (2019).

### **3.2. Descriptive Statistics**

The summary statistics for each variable are presented in Table 1. There is a general presumption that even though income per capita in urban areas are higher than in rural areas, the gap between the rich and the poor are usually larger in urban than rural areas. The statistics in Table 1 has confirmed this presumption. Based on the table, it can be observed that inequality in



urban society, on average, is higher than in rural areas. In contrast, the poverty rate in rural areas is, on average, two times higher than in urban areas. It is worth to note that the number of observations between urban and rural areas could be different because some of the provinces, such as Special Capital Region of Jakarta, do not have rural areas in its region.

**Table 1.** Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Gini Index:					
Gini Index Total	394	24.84	28.45	16.39	35.14
Gini Index Urban	394	25.10	3.24	14.51	31.81
Gini Index Rural	382	21.31	2.89	12.08	37.92
Poverty Rate:					
Poverty Total (%)	396	13.67	7.62	3.48	40.83
Poverty Urban (%)	363	8.87	4.91	2.66	30.44
Poverty Rural (%)	352	16.18	9.15	4.48	50.47
Infrastructure Expenditure Per capita. (000 Rupiahs)	395	222.08	254.03	6.82	1930.21
Social Aid Expenditure Per capita. (000 Rupiahs)	359	25.99	47.83	0.024	310.742
Subsidy & Grant Per capita (000 Rupiahs)	369	121.75	129.39	0.054	1003.79
Years of Education	393	11.63	1.01	8.73	14.69
Unemployment Rate (%)	393	6.44	2.89	1.38	15.93
GRP per capita (mil Rupiahs)	396	34.69	30.92	2.96	168.92

Source: Author's Calculation

The dispersion of government spending between regions and years is quite large. For example, the smallest infrastructure expenditure was only 6,824 Rupiahs per capita for North Sulawesi in 2005, while West Papua had the largest infrastructure expenditure of 1,930,211 Rupiahs per capita in 2015. This large dispersion is likely to happen because there are specific government policies to promote certain underdeveloped regions in particular years. Consequently, it could affect the coefficients in the regression results. Therefore, this paper will use the time effects to eliminate those problems.

With regard to the level of education and GRP per capita, Table 1 shows that people, on average, have almost 12 years of education with earnings of approximately 35 million Rupiahs per year. In addition,

Banten suffered the highest unemployment rate of 16% in 2008, while Bali had the lowest unemployment rate in 2017.

### 3.3. Econometrics Model

A set of equations using a panel data approach is used to examine the effect of government expenditure on income inequality and poverty in Indonesia. Panel data is used in this paper because it combines both time series and cross-section data; thus, it increases the number of observation and gives more degree of freedom (Hsiao 2005: 145-148).

The regression models in this paper are not only divided into four groups based on the types of government spending as the main independent variables, but also each regression models are divided into three categories (total, rural, and urban):

- The effect of infrastructure expenditure on income inequality and poverty:

$$Ineq_{it} = \alpha + \beta 1 \text{LogInfra}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 i.\text{year} + \epsilon_{it}$$

$$Pov_{it} = \alpha + \beta 1 \text{LogInfra}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 \text{Ineq}_{it} + \beta 6 i.\text{year} + \epsilon_{it}$$

- The effect of social aid expenditure on income inequality and poverty:

$$Ineq_{it} = \alpha + \beta 1 \text{LogSocial}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 i.\text{year} + \epsilon_{it}$$

$$Pov_{it} = \alpha + \beta 1 \text{LogSocial}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 \text{Ineq}_{it} + \beta 6 i.\text{year} + \epsilon_{it}$$

- The effect of subsidy and grant expenditure on income inequality and poverty:

$$Ineq_{it} = \alpha + \beta 1 \text{LogSubGra}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 i.\text{year} + \epsilon_{it}$$

$$Pov_{it} = \alpha + \beta 1 \text{LogSubGra}_{it} + \beta 2 \text{Educ}_{it} + \beta 3 \text{Unemp}_{it} + \beta 4 \text{LogGRP}_{it} + \beta 5 \text{Ineq}_{it} + \beta 6 i.\text{year} + \epsilon_{it}$$

where:

- Ineq = Income inequality, measured by Gini Coefficient
- Pov = Poverty rate (%)
- Log\_Infra = Infrastructure expenditure (in logarithm form)
- Log\_Social = Social aid expenditure (in logarithm form)
- Log\_SubGra = Subsidy and grant expenditure (in logarithm form)
- Educ = The number of years of education
- Unemp = Unemployment rate (%)
- Log\_GRP = Gross Regional Product per capita (in logarithm form)
- i.year = Time effect

Infrastructure, social aid, subsidy-grant, and GRP are variables that involve money; therefore, the logarithmic formulation is more appropriate than the linear form (Wooldridge 2016; Emerson 2014; Zarembka 1968). Transforming those variables to the logarithmic formulation is essential because people tend to think about money in multiplicative terms rather than additive ones. For example, a 100,000 Rupiahs per year raise feels very different if infrastructure expenditure per capita is 1,000,000 Rupiahs than if it is 10,000,000 Rupiahs.

Furthermore, to investigate the relationship between inequality and poverty with the independent variables, this paper will analyse the data using the Fixed Effect Model (FEM) and Random Effect Model (REM). The Hausman test will be used to select the best model among those two models. Moreover, since there is a possibility of the error correlation in the equations; thus, this paper also uses the Seemingly Unrelated Regression (SURE) system.

**3.4. Panel Data Model Selection**

The Hausman test is used to determine which model is better between FEM or REM. It tests whether the unique errors are correlated with regressors. The hypothesis is as follow:

$H_0$  : The preferred model is the Random Effect Model (REM)

$H_1$  : The preferred model is the Fixed Effect Model (FEM)

If the p-value is insignificant ( $p > 0.05$ ), then it is safe to use the random effect model. If we get a significant p-value ( $p < 0.05$ ), however, we should use the fixed effect model.

The results of the Hausman test for each regression are presented in the Table 2 and 3. The tables show a significant p-value by the Hausman test. It indicates that the coefficients estimated by the random effects and fixed effects model are not the same. The p-value is insignificant (larger than 0.05 or 5%) suggests that Random Effect Model (REM) is the preferred model, except for the effect of subsidy and grant expenditure on income inequality in urban areas, which will use Fixed Effect Model (FEM).

Regarding the regression models which fail to meet the asymptotic assumptions of the Hausman test ( $\chi^2 < 0$ ), this paper will use the non-statistical consideration by comparing the time series unit and cross-section unit (the number of individuals). It is said that if the number of individuals is larger than time series unit, then REM is preferable. On the contrary, if the time series unit is larger than the number of individuals, then FEM is better (Baltagi 1995; Nachrowi and Usman 2006).

**Table 2.** Hausman Test for the Effect of Government Expenditure on Income Inequality

	Gini Total		Gini Urban		Gini Rural	
	P-value	Preferred Model	P-value	Preferred Model	P-value	Preferred Model
Infrastructure Exp.	0.976	REM	0.566	REM	0.245	REM
Social Aid Exp.	0.998	REM	0.512	REM	0.870	REM
Subsidy and Grant Exp.	0.999	REM	0.0005	REM	0.716	REM

**Table 3.** Hausman Test for the Effect of Government Expenditure on Poverty

	Poverty Total		Poverty Urban		Poverty Rural	
	P-value	Preferred Model	P-value	Preferred Model	P-value	Preferred Model
Infrastructure Exp.	0.996	REM	0.965	REM	$\chi^2 < 0$	REM
Social Aid Exp.	$\chi^2 < 0$	REM	0.997	REM	$\chi^2 < 0$	REM
Subsidy and Grant Exp.	$\chi^2 < 0$	REM	0.678	REM	$\chi^2 < 0$	REM

Since this paper uses data of 33 provinces in twelve years period, it means the number of individuals is larger than the time series unit. Therefore, REM is the preferred model for this case.

It is worth to note that even though the Hausman test suggests that random effect is the preferred model, this paper still reports the results of the fixed effect model and the Seemingly Unrelated Regression system for comparative reasons and to enable result robustness.

**4. RESULTS**

This section presents the results of the regression analysis, whether using the Fixed Effect Model (FEM), Random Effect Model (REM), or Seemingly Unrelated Regression (SURE) system. Government expenditure per capita is used as proxy to measure its impact on income inequality and poverty in Indonesia because it is the most used proxy for government expenditure in

the literature (Ogun 2010; Ospina 2010; Wokadala et al. 2010). The data for this proxy is obtained by dividing the amount of government expenditure with the total population in the province.

The structure of this section is divided into two sub-sections. The first sub-section will present the regression results of the effect of infrastructure, social aid, subsidy and grant expenditure on income inequality in Indonesia. The second sub-section will show the role of infrastructure, social aid, subsidy and grant expenditure on reducing the poverty rate. All results will be presented in terms of income inequality and poverty in total, urban, and rural areas using the fixed effect, random effect, and SURE system.

#### 4.1. The Effect of Government Expenditure on Income Inequality

The empirical evidence of the impact of infrastructure, social aid, subsidy and grant expenditure on income inequality, both in urban and rural areas is presented in Table 4.

Table 4 reports three sets of results; first, the results of the effect of independent variables on income inequality in total; second, it reports the empirical evidence regarding the impact of the regressors toward income distribution in urban areas; and third, it presents the regression results for income inequality

in rural areas. All three sets of results are obtained by using three regression models: the random effect model in column (1), (4), and (5); the fixed effect model in column (2), (5), (8); and the SURE system in column (3), (6), and (9).

Based on Table 4, all three regression models suggest that infrastructure expenditure has a negative correlation with income inequality for the Gini total, the Gini urban, and the Gini rural, which means the more the government devotes fund to build infrastructure, the less gap between the rich and the poor. However, the results are only statistically significant at 5% level for Gini urban when using random effect, and Gini rural when using fixed effect. According to the random effect model, it is suggested that every time the government increases infrastructure expenditure by one per cent, the Gini index for urban areas will decrease by 0.0049 points on average. Similarly, the fixed effect model suggests that a one per cent increase in infrastructure spending reduces the Gini index in rural areas by 0.0054 points on average.

Regarding social aid expenditure, it can be observed from Table 4 that social aid spending is not an important determinant for income inequality in total and urban areas. The results are consistent with Habibov and Fan (2006: 222-223), who found that social aid programmes have an insignificant effect on income inequality. In contrast, the evidence suggests

**Table 4.** Estimation Results for the Effect of Government Expenditure on Income Inequality

VARIABLES	Gini Total			Gini Urban			Gini Rural		
	REM	FEM	SURE	REM	FEM	SURE	REM	FEM	SURE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log Infrastructure	-0.182 (0.214)	-0.124 (0.234)	-0.124 (0.219)	-0.496** (0.240)	-0.077 (0.297)	-0.089 (0.249)	-0.298 (0.237)	-0.536** (0.265)	-0.024 (0.221)
Log Social Aid	0.086 (0.067)	0.101 (0.069)	0.101 (0.064)	-0.082 (0.083)	-0.007 (0.086)	0.052 (0.073)	0.175** (0.082)	0.184** (0.085)	0.162** (0.070)
Log Subsidy and Grant	0.133 (0.090)	0.137 (0.091)	0.137 (0.085)	0.101 (0.114)	0.151 (0.115)	0.098 (0.103)	0.089 (0.101)	0.064 (0.101)	-0.138 (0.089)

Standard errors in parentheses

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1

**Table 5.** Estimation Results for the Effect of Government Expenditure on Poverty

VARIABLES	Poverty Total			Poverty Urban			Poverty Rural		
	REM	FEM	SURE	REM	FEM	SURE	REM	FEM	SURE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log Infrastructure	-0.298 (0.215)	-0.389* (0.214)	-0.389* (0.200)	-0.488** (0.189)	-0.481** (0.192)	-0.481** (0.179)	-0.5823** (0.250)	-0.646*** (0.245)	-0.646*** (0.228)
Log Social Aid	0.080 (0.063)	0.071 (0.062)	0.071 (0.058)	0.095* (0.054)	0.096* (0.055)	0.096* (0.050)	-0.004 (0.081)	-0.023 (0.077)	-0.023 (0.071)
Log Subsidy and Grant	0.007 (0.082)	-0.001 (0.081)	-0.001 (0.075)	-0.045 (0.077)	-0.051 (0.077)	-0.051 (0.072)	-0.032 (0.100)	-0.052 (0.097)	-0.052 (0.090)

Standard errors in parentheses

\*\*\*p<0.01, \*\*p<0.05, \*p<0.1

that social aid expenditure positively affects income inequality in rural areas at a significance level of 5%, which means the more the government devotes fund in social spending, the worse income inequality in rural areas.

Furthermore, subsidy and grant expenditure seem to have no significant impact on income inequality, both in urban and rural areas. The results are consistent whether using the fixed effect, random effect, or SURE model.

#### 4.2. The Effect of Government Expenditure on Poverty

The regression results of the impact of government expenditure on poverty are presented in Table 5. The empirical evidence suggests that infrastructure expenditure is negatively associated with the level of poverty in total, urban, and rural areas, which is in line with the hypothesis. All results are statistically significant, except for poverty total when using the random effect model. Moreover, it can be observed from Table 5 that the impact of infrastructure spending is more significant on income inequality in rural than urban areas. The fixed effect and SURE model suggest that a one per cent increase in infrastructure expenditure will reduce the poverty rate, on average, as much as 0.0048 percentage points in urban areas, and the results are 0.0017 percentage points higher for poverty in rural areas. Meanwhile, the random effect model indicates that an increase in infrastructure spending by one per cent leads to a decline in poverty rate as much as 0.0049 percentage points (in urban areas) and 0.0052 percentage points (in rural areas). These results are aligned with the prior studies that conclude an increase in infrastructure spending leads to a decline in the poverty rate (Lokshin and Yemtsov 2005; Ogun 2010; Wokadala et al. 2010).

With regard to social aid expenditure, it does not seem to have a correlation with the poverty rate. The result is only significant at 10% level in poverty for urban areas. It is suggested that one per cent increase in social aid expenditure per capita will increase the poverty rate in urban areas by 0.00095% on average, which is not practically significant because the coefficients are relatively too small. Therefore, it can be said that there is insignificant evidence of the effectiveness of social aid spending to reduce poverty in Indonesia. These results align with the previous studies who expressed that social aid spending has no correlation with the incidence of poverty (Habibov and Fan 2006; Van den Berg and Chuong 2011).

Moreover, the empirical evidence suggests that subsidy and grant expenditure are negatively associated with the level of poverty for both in urban and rural areas. However, none of these results is significant, which concurs with Permadi (2018: 231), who expressed that education and health subsidies have

not yet benefited the poor in Indonesia. This is because the subsidy and grant spending fund are relatively too small to have a significant impact on reducing the level of income inequality and poverty in Indonesia. According to the Statistics Bureau of Indonesia (2019), the average shares of subsidy-grant expenditure with respect to GRP are only 0.41%.

## 5. DISCUSSION

Looking at the results and findings in the previous section, it can be concluded that infrastructure is the only expenditure that has a significant impact on income inequality and poverty. These results confirm the findings of previous studies in the literature that infrastructure spending could decrease the incidence of income inequality and poverty (Ospina 2010; Sylwester 2002). In contrast, social aid, subsidy, and grant expenditure seem to have no effect on reducing income inequality and poverty in Indonesia.

Based on the description above, these results suggest that among these types of expenditure, infrastructure is the most effective expenditure to improve the welfare and create the best outcomes for low-income households. This insight could be useful for policymakers to help them setting the priority regarding where to spend the money.

Furthermore, the failure of other expenditures on reducing income inequality and poverty could be explained by two reasons. First, according to the Statistics Bureau of Indonesia (2019), the average shares of infrastructure, social aid, and subsidy-grant expenditure with respect to GRP are only 0.69%, 0.086%, and 0.41%, respectively. These shares of government spending fund are relatively too small to have a significant impact on reducing the level of income inequality and poverty in Indonesia. Second, there is a targeting problem and identifying which community is more vulnerable. Subsidies, grant, and social aid expenditure should give more benefit to low-income than middle or high-income groups. However, this is not always the case in Indonesia. For instance, US\$ 22 billion (3% of GDP) was allocated for fuel subsidies in 2015 (Climate Scorecard 2018). If government spending goal is to reduce poverty and inequality, then these fuel subsidies expenditure is not effective because these subsidies give more benefit to the people who own cars, which are usually middle-high income households. According to Dartanto (2013: 118), 72% of total fuel subsidies in Indonesia is enjoyed by the top 30% income households.

Therefore, an increase in the shares of social aid and subsidy-grant expenditure is required to create a more significant impact on reducing poverty and inequality in Indonesia. Besides, government needs to review their policy, not only regarding where to spend the money, but also which communities who need it the most.



## 6. CONCLUSION AND RECOMMENDATION

### 6.1. Conclusions

The research has focused on the effect of government expenditure on the incidence of income inequality and poverty in Indonesia. It has looked into the effect of infrastructure expenditure, social aid spending, subsidy and grant expenditure on income inequality and poverty in Indonesia. Also, it has examined the difference between the impact of government expenditure on income inequality and poverty in urban and rural areas.

Using the fixed effect, random effect, and Seemingly Unrelated Regression (SURE) system, this paper finds that social aid, subsidy and grant expenditure have an insignificant effect on reducing income inequality and poverty in Indonesia. However, the empirical evidence suggests that infrastructure spending has a negative correlation with income inequality in urban areas (when using the random effect model), and rural areas (when using the fixed effect model). In addition, infrastructure expenditure is also negatively and significantly correlated with poverty in Indonesia, and the impact is more significant in rural than urban areas.

### 6.2. Policy Recommendation

As implied in the result and conclusion sections, the type of government expenditure that has significant impacts on reducing poverty and income inequality in Indonesia is infrastructure expenditure. It may suggest that policymakers need to focus on increasing the infrastructure expenditure to boost economic activities and improve the welfare of the people, especially the poor ones. Therefore, it would decrease the poverty rate and narrow the gap between low and high-income households. Moreover, the impact of infrastructure expenditure on the incidence of poverty seems to be more significant in rural than urban areas. This result could be important for policy recommendation because it could provide an insight for the government on where to spend the infrastructure expenditure funds.

### 6.3. Limitation and Future Research

Finally, in terms of the limitation of this paper, the main one is the lack of income inequality data. The only data available to measure income inequality in Indonesia at the regional level is the Gini index. However, the earliest data of the Gini index is from 2005. Therefore, this research can only use data from 2005 to 2017 (twelve years). Another limitation of the analysis lies in the lack of corruption index as a control variable. According to Transparency International (2018), Indonesia's Corruption Perceptions Index (CPI) in 2018 is 38<sup>1</sup>, which is quite low compared to

<sup>1</sup> The Corruption Perceptions Index has a value from 0 to 100, where 0 is highly corrupt, and 100 is very clean.

the average world's score (43). It indicates that the level of corruption in Indonesia is still high, and it may distort government priorities and the effectiveness of government spending (IMFBlog 2019). However, this paper cannot include the corruption index into the analysis since data for the corruption index per province in Indonesia is still not available. This opens the opportunity for further research to include the corruption index into the analysis.

## REFERENCES

- Ahluwalia, M.S. (1976) 'Inequality, Poverty and Development', *Journal of Development Economics* 3(4): 307-342.
- Akresh, R., D. De Walque and H. Kazianga (2016) Evidence from a Randomized Evaluation of the Household Welfare Impacts of Conditional and Unconditional Cash Transfers Given to Mothers or Fathers. The World Bank.
- Anderson, E., M.A. Jalles D'Orey, M. Duvendack and L. Esposito (2017) 'Does Government Spending Affect Income Inequality? A Meta-Regression Analysis', *Journal of Economic Surveys* 31(4): 961-987.
- Awan, M.S., N. Malik, H. Sarwar and M. Waqas (2011) 'Impact of Education on Poverty Reduction'.
- Baird, S., F.H. Ferreira, B. Özler and M. Woolcock (2014) 'Conditional, Unconditional and Everything in between: A Systematic Review of the Effects of Cash Transfer Programmes on Schooling Outcomes', *Journal of Development Effectiveness* 6(1): 1-43.
- Baltagi, B.H. (1995) *Econometric Analysis of Panel Data*. Vol. 2. Wiley New York.
- Castro-Leal, F. (1999) *The Impact of Public Health Spending on Poverty and Inequality in South Africa*. World Bank, Country Department I, Africa Region.
- Climate Scorecard (2018) 'Indonesia Subsidies'. Accessed 22 July 2019 <<https://www.climate-scorecard.org/2018/01/indonesia-subsidies/>>.
- Cozzi, G. and G. Impullitti (2010) 'Government Spending Composition, Technical Change, and Wage Inequality', *Journal of the European Economic Association* 8(6): 1325-1358.
- Dartanto, T. (2013) 'Reducing Fuel Subsidies and the Implication on Fiscal Balance and Poverty in Indonesia: A Simulation Analysis', *Energy Policy* 58: 117-134.
- De Silva, I. and S. Sumarto (2014) 'Does Economic Growth Really Benefit the Poor? Income Distribution Dynamics and Pro-Poor Growth in Indonesia', *Bulletin of Indonesian Economic Studies* 50(2): 227-242.

- Emerson, S. (2014) 'Use of Ratios and Logarithms in Statistical Regression Models', Department of Biostatistics, University of Washington, USA.
- Farrington, J. and R. Slater (2006) 'Introduction: Cash Transfers: Panacea for Poverty Reduction or Money Down the Rain?', *Development Policy Review* 24(5): 499-511.
- Fernald, L.C., P.J. Gertler and L.M. Neufeld (2008) 'Role of Cash in Conditional Cash Transfer Programmes for Child Health, Growth, and Development: An Analysis of Mexico's Oportunidades', *The Lancet* 371(9615): 828-837.
- Fields, G.S. (1980) Poverty, Inequality, and Development. CUP Archive.
- Fields, G.S. (1980) 'Education and Income Distribution in Developing Countries: A Review of the Literature'.
- Habibov, N. and L. Fan (2006) 'Social Assistance and the Challenges of Poverty and Inequality in Azerbaijan, a Low-Income Country in Transition', *J.Soc. & Soc. Welfare* 33: 203.
- Hsiao, C. (2005) 'Why Panel Data?', *The Singapore Economic Review* 50(02): 143-154.
- IMFBlog (2019) 'Tackling Corruption in Government'. Accessed 21 July 2019 <<https://blogs-imf-org.eur.idm.oclc.org/2019/04/04/tackling-corruption-in-government/>>.
- International NGO Forum on Indonesian Development (2017) 'OXFAM Briefing Paper'. Accessed 5 September 2017. [www.oxfam.org](http://www.oxfam.org)
- Kakwani, N.C. (1980) Income Inequality and Poverty. World Bank New York.
- Kakwani, N. (1993) 'Poverty and Economic Growth with Application to Cote D'Ivoire', *Review of Income and Wealth* 39(2): 121-139.
- Kakwani, N., H.H. Son, S.K. Qureshi and G. Arif (2003) 'Pro-Poor Growth: Concepts and Measurement with Country Case Studies [with Comments]', *The Pakistan Development Review* : 417-444.
- Kuznets, S. (1955) 'Economic Growth and Income Inequality', *The American Economic Review*: 1-28.
- Lloyd-Sherlock, P. (2006) 'Simple Transfers, Complex Outcomes: The Impacts of Pensions on Poor Households in Brazil', *Development and Change* 37(5): 969-995.
- Lokshin, M. and R. Yemtsov (2005) 'Has Rural Infrastructure Rehabilitation in Georgia Helped the Poor?', *The World Bank Economic Review* 19(2): 311-333.
- Martínez, R., L. Ayala and J. Ruiz-Huerta (2001) 'The Impact of Unemployment on Inequality and Poverty in OECD Countries', *Economics of Transition* 9(2): 417-447.
- Nachrowi, N.D. and H. Usman (2006) 'Popular and Practical Econometrics Approach for Economic and Financial Analysis', *Jakarta: Lembaga Penerbit Fakultas Ekonomi Universitas Indonesia* .
- Ogun, T. (2010) 'Infrastructure and poverty reduction: Implications for urban development in Nigeria', *Urban Forum*, Springer pp249-266.
- Ospina, M. (2010) 'The Effect of Social Spending on Income Inequality: An Analysis for Latin American Countries'.
- Permadi, Y.A. (2018) 'Growth, Inequality, and Poverty: An Analysis of Pro-Poor Growth in Indonesia', *Jurnal Ekonomi Kuantitatif Terapan*: 2303-0186.
- Robertson, L., P. Mushati, J.W. Eaton, L. Dumba, G. Mavise, J. Makoni et al. (2013) 'Effects of Unconditional and Conditional Transfers on Child Health and Development in Zimbabwe: A Cluster-Randomized Trial', *The Lancet* 381(9874): 1283-1292.
- Schultz, T.W. (1963) *The Economic Value of Education*. Columbia University Press.
- Smeeding, T.M., P. Saunders, J. Coder, S. Jenkins, J. Fritzell, A.J. Hagenars et al. (1993) 'Poverty, Inequality, and Family Living Standards Impacts Across Seven Nations: The Effect of Noncash Subsidies for Health, Education and Housing', *Review of Income and Wealth* 39(3): 229-256.
- Stack, S. (1978) 'The Effect of Direct Government Involvement in the Economy on the Degree of Income Inequality: A Cross-National Study', *American Sociological Review*: 880-888.
- Sylwester, K. (2002) 'Can Education Expenditures Reduce Income Inequality?', *Economics of education review* 21(1): 43-52.
- Transparency International (2018) 'Corruption Perceptions Index 2018'. Accessed 22 July 2019 <<https://www.transparency.org/cpi2018>>.
- The Statistics Bureau of Indonesia (2019a) 'Profile Kemiskinan di Indonesia Maret 2019 (Poverty Profile in Indonesia on March 2019)'. Accessed 13 June 2019 < <https://www.bps.go.id/pressrelease/2019/07/15/1629/persentase-penduduk-miskin-maret-2019-sebesar-9-41-persen.html>>
- The Statistics Bureau of Indonesia (2019b) 'Tingkat Pengangguran Terbuka Menurut Propinsi (The Open Unemployment Rate by Province)'. Accessed 13 June 2019 < <https://www.bps.go.id/statictable/2014/09/15/981/tingkat-pengangguran-terbuka-tpt-menurut-provinsi-1986---2018.html>>
- The Statistics Bureau of Indonesia (2019c) 'Gini Ratio Propinsi 2002-2018 (Gini Ratio Province

2002-2018)'. Accessed 15 June 2019 <<https://www.bps.go.id/dynamictable/2017/04/26%2000:00:00/1116/gini-ratio-provinsi-2002-2018.html>>

The Statistics Bureau of Indonesia (2019d) 'Angka Partisipasi Sekolah Menurut Propinsi (The Participation School Rate by Province)'. Accessed 13 June 2019 < <https://www.bps.go.id/linkTableDinamis/view/id/1054>>

The Statistics Bureau of Indonesia (2019f) 'Persentase Penduduk Miskin Menurut Propinsi (The Poverty Rate by Province). Accessed 15 June 2019<<https://www.bps.go.id/dynamictable/2017/04/26%2000:00:00/1116/gini-ratio-provinsi-2002-2018.html>>

The Statistics Bureau of Indonesia (2019g) 'Gross Regional Domestic Product of Province in Indonesia by Expenditure'. Jakarta: the Statistics Bureau of Indonesia.

The Statistics Bureau of Indonesia (2019h) 'Financial Statistics of Province Governance'. Jakarta: the Statistics Bureau of Indonesia.

The World Bank Data (2019) 'World Bank Open Data'. Accessed 17 May 2019 <<https://data.worldbank.org/>>.

Van den Berg, M. and N.V. Cuong (2011) 'Impact of Public and Private Cash Transfers on Poverty and Inequality: Evidence from Vietnam', *Development Policy Review* 29(6): 689-728.

Wooldridge, J.M. (2016) 'Introductory Econometrics: A Modern Approach'. *Nelson Education*.

Wokodala, J., N. Magidu and M. Guloba (2010) 'Public Spending in the Water Sub-Sector in Uganda: Evidence from Benefit Incidence Analysis'.

Zarembka, P. (1968) 'Functional Form in the Demand for Money', *Journal of the American Statistical Association*, 63(322): 502.