

Research article

## The Relationship between Government Debt and Social Welfare

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**Abstract:** This study aims to analyze the relationship between government debt and social welfare in Indonesia in 1980-2019. The data used in this research is secondary data using time series data. The analysis used is the Error Correction Model (ECM). The findings result from the first model show that in the short-run, additional debt-to-GDP was not significant to the poverty level and GDP per capita. Meanwhile, the long-run, additional debt-to-GDP is significant to the poverty level and GDP per capita. The results also find that in the long run additional debt-to-GDP is positively correlated with poverty levels in Indonesia, meaning that additional debt-to-GDP increases the poverty rate in Indonesia. For GDP per capita, additional debt-to-GDP has a negative correlation. The inflation, tax-to-GDP, and GDP are not significant to the poverty rate in the short-run. Meanwhile, the long run, the additional debt-to-GDP ratio and GDP variable is significant to the poverty rate, and has a positif and negative correlation. The findings from second model also indicate that population and inflation are significant and positively correlated with the poverty level, but tax-to-GDP ratio is not significant on GDP per capita in the short-run. Meanwhile, the long run, the population and tax-to-GDP are significant to GDP per capita. Total population has a positive correlation, while tax-to-GDP ratio has a negative correlation.

**Keywords:** Government Debt, Social Welfare

**JEL Classification:** C22, H63

**Abstrak:** Penelitian ini bertujuan untuk menganalisis hubungan antara utang pemerintah dan kesejahteraan sosial di Indonesia tahun 1980-2019. Data yang digunakan dalam penelitian ini adalah data sekunder dengan menggunakan data time series. Analisis yang digunakan adalah Error Correction Model (ECM). Hasil temuan dari model pertama menunjukkan bahwa dalam jangka pendek, penambahan utang terhadap PDB tidak signifikan terhadap tingkat kemiskinan dan PDB per kapita. Sementara itu, dalam jangka panjang, tambahan utang terhadap PDB signifikan terhadap tingkat kemiskinan dan PDB per kapita. Hasil penelitian juga menemukan bahwa dalam jangka panjang tambahan utang terhadap PDB berkorelasi positif dengan tingkat kemiskinan di Indonesia, yang berarti bahwa tambahan utang terhadap PDB meningkatkan tingkat kemiskinan di Indonesia. Untuk PDB per kapita, tambahan utang terhadap PDB memiliki korelasi negatif. Inflasi, pajak terhadap PDB, dan PDB tidak signifikan terhadap tingkat kemiskinan dalam jangka pendek. Sementara itu, dalam jangka panjang, variabel tambahan debt to GDP ratio dan GDP signifikan terhadap tingkat kemiskinan, dan memiliki korelasi positif dan negatif. Temuan dari model kedua juga menunjukkan bahwa populasi dan inflasi signifikan dan berkorelasi positif dengan tingkat kemiskinan, tetapi rasio pajak terhadap PDB tidak signifikan terhadap PDB per kapita dalam jangka pendek. Sementara itu, dalam jangka panjang, jumlah penduduk dan pajak terhadap PDB signifikan terhadap PDB per kapita. Jumlah penduduk berkorelasi positif, sedangkan rasio pajak terhadap PDB berkorelasi negatif.

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## 1. INTRODUCTION

To strengthen a country's economy condition, it requires sustainable development. Many developing countries including Indonesia face the problem of limited financial capital for development (Gurtner, 2010). They have lack of revenues to finance expenditure needs, which lead to budget deficit. In order to overcome the deficit, Indonesia carries out debts. According to Todaro & Smith (2011) since 1970 the Indonesian economy has increased significantly, during Pelita I it has increased by 7% per year. GDP per capita community grew US\$. 70 in 1967 to US\$. 1,110 in 1997. However, increasing government debt raises new concerns about the impact of future debt. The debt shifted from bilateral/multilateral debt to debt securities. Based on data from the largest creditor country for Indonesia, Singapore was 69353 million US \$ in 2019. The largest creditor institutions for Indonesia are IBRD (World Bank) and ADB. The total government foreign debt in 2019 is around US \$ 403.68 million. In 2019, Indonesia's total debt of IDR 5611.56 trillion is equivalent to 403.68 million in US \$. The composition of government debt in 2019 was 58.7: 41.3 (58.7% in rupiah, 41.3% in foreign currency).

On a formal basis, debt is the revenue used to increase investment to boost economic growth. Meanwhile, based on its function, debt is one of the choices of sources to finance those used in development (Anning et al., 2016; and Syaparuddin & Dahmiri, 2010). According to Akram (2016), debt can be disastrous for a country. The economy in a country that is in debt is not getting better, it can even get worse. The situation above is a conclusion from the results of his research. This conclusion suggests that in the 1980s developed countries (usually creditor countries) flowed capital from developed countries in the form of official development assistance and export credit, and private capital flows such as bilateral and multilateral aid.

According to the regulations, Indonesia will use every debt for development spending. The hope is that funding for various developments and economic growth can be seen by increasing the value of GDP and creating jobs, which in turn can help reduce poverty. In terms of quality and quantity, Indonesia's debt situation cannot be separated from the previous economic situation. In other words, the previous year's poor economic performance caused debt problems. Even so, the government in the debt government is always there to finance the development budget deficit (Satya, 2016).

Debt is a source of data on budget and economic development. Debt is used to finance government spending so that future economic plans can be supported, which can encourage future economic growth. An economy that thrives in calculating employment and economizing (Arsyad, 2010; and Kusumasari, 2020). According to the State Finance Law No. 17/2013 the maximum budget deficit (APBN and APBD) covered by debt is 3% of GDP. This is in line with the 1992 the Treaty of Maastricht, which states that the maximum budget deficit covered by debt is 3% of GDP with concessions. According to the State Finance Law Number 17 of 2003, the maximum total debt of the central and local governments is 60% of GDP. This is in line with the Treaty of Maastricht in 1992, according to him, the maximum total debt of the central and local governments is 60% of GDP with concessions (Stein, 2015).

A debt-financed government budget deficit results in an increase in individual consumption which reduces the saving rate and leads to an increase in interest rates. Rising interest rates result in lower private investment. Classical economists concluded that solving the government deficit with debt would cause private investment to decline. Keynesian states that debt in the short-run will benefit the economy. According to Keynesian, the state budget which is financing from debt has a significant effect on welfare or economic growth, because it will increase income and welfare so that consumption will increase (Eisner, 2000).

According to the Ricardian Equivalent theory, the government cannot trigger welfare or economic growth that is financed by debt because it will not change demand (Mankiw, 2009). This is because the intelligent people know that in the future, taxes will be greater than government debt. So, people would rather save excess money than spend money on consumption. The Ricardian Equivalence theory sees that the tax in the coming year is equivalent to the current debt. The result of this view is that debt financed by tax cuts will have no future impact. Assume national savings

are fixed amounts of private savings and government savings. Therefore, an increase in private savings will reduce government savings. As a result, the relationship between debt and social welfare is that cutting taxes on debt will not affect people's welfare (Eisner, 2000)..

The positive impact of debt is its impact on economic development and social welfare. The flow of debt increases domestic income and saving, so debt will have a positive multiplier effect on the economy. The reason is that an increase in the flow of debt for investment will increase domestic income and savings. Debt is needed in order to encourage a positive impact on people's welfare, namely increasing GDP per capita and alleviating poverty (Eisner, 2000).

Social welfare is a series of social, material and spiritual life and livelihood that includes a sense of security, morality, and inner and outer peace, so that every community can work hard to satisfy themselves so that their physical, mental and social needs are beneficial to themselves, their families and society. Meanwhile, according to research by Imron (2012) people's welfare is understood as social welfare. Imron (2012) adds the following to Article 1 paragraph 1 of Law Number 11 of 2009 concerning Social Welfare: Social welfare is to meet the material, spiritual, and social needs of the community so that they can live properly and independently so that the conditions of development can run its social function can be achieved. An increase in social welfare has an impact on (1) increasing income in quantity; (2) better family health in quality; (3) family economic investment in the form of savings.

Economic organization research uses the demand for strategic goods as an index of social welfare. Another measure of social welfare is food expenditure. Social welfare is a reflection of the quality of human life, which is a condition where basic needs are met and the values of life are realized. Family social health and family social welfare refer to families that can give birth to individuals with good growth and development abilities. The concept of social welfare is a national welfare and service system designed to help people obtain social, economic, educational and health needs that are vital for the survival of the community. The welfare of someone who is underprivileged will be very low, and the lack of ability can result in certain functions not being realized, thus reducing their welfare (Hardini & Wasiaturrahma, 2020).

Although it does not have a strong substantive limit on social welfare, the level of social welfare includes food, education, health, and social protection, such as employment opportunities, old age security, and freedom from poverty. The variables usually used to measure people's welfare are HDI, poverty level, GDP per capita, Gini ratio, Gross National happiness, quality of life index, happiness index, population growth rate, population density per km, literacy rate, average length of schooling, life expectancy, per capita expenditure, and number of poor people.

There have been some previous studies that discuss the relationship between debt and people's welfare or economic growth. Ningrum (2018) stated that the development of Indonesia's foreign debt is increasing from year to year. In the short-run, foreign debt has contributed significantly to the financing of national economic development. Then, Syaparuddin and Dahmiri (2010) examined variables that influenced the government's foreign debt. Hanif & Pasaribu (2018) revealed that external debt variable has a significant negative impact on the economic growth of developing countries in the world. Handra and Kurniawan (2020) assessed a long-run relationships between the ratio of government debt to GDP and Indonesia's economic growth. Matiti (2013) assessed that sustainability of Kenya's domestic debt after improving economic performance. Based on the description, this study aims to examine such relationship. It is expected to contribute to the research gap as well as a reference for government fiscal policy.

## **2. RESEARCH METHODS**

### *2.1. Data*

The data in this study are secondary data obtained from Central Bureau of Statistics (BPS) and Ministry of Finance Republic of Indonesian during of 1980-2019. The data used are poverty rate data (percent); additional debt/GDP (ratio), inflation (percent); tax revenue/GDP (ratio); real GDP (IDR); GDP per capita (IDR); and the population (persons). The data are detail presented in Table 1 as follows:

**Table 1.** Data and Measurement

Variable	Descriptions	Measurement	Source
PR	Poverty rate is conditions that cannot meet basic needs	Percent	BPS
RDEBT	Ratio additional debt to GDP is adoption from annual increase in debt divided by GDP	Ratio	Ministry of Finance
INF	Inflation is a process of increasing prices continuously and related to market mechanisms such as increasing public consumption	Percent	BPS
RTAX	Ratio tax revenue to GDP is adoption from tax revenue each year divided by GDP	Ratio	Ministry of Finance
GDP	GDP is the value of all goods and services produced in a country in a certain period (annually)	Rupiah	BPS
GDPC	GDP per capita is the average income of the population in a country.	Rupiah	BPS
POP	Total population is the group of people in a certain area and time.	Persons	BPS

## 2.2 Model Specification

The research method used is the Error Correction Model (ECM). To analyze the relationship between the dependent variable and the independent variable, various regression analysis methods were used for data processing. The data used in this study is a time series from 1980-2019. The model used in this study was adopted from Ningrum (2018) research. The models used in this research are:

First model for the The long-run model:

$$PR_t = \alpha_0 + \beta_1 RDEBT_t + \beta_2 INF_t + \beta_3 RTAX_t + \beta_4 GDP_t + e_t \quad (1)$$

The short-run model:

$$\Delta PR_t = \alpha_0 + \alpha_1 \Delta RDEBT_t + \alpha_2 \Delta INF_t + \alpha_3 \Delta RTAX_t + \alpha_4 \Delta GDP_t + \beta_1 \Delta RDEBT_{t-1} + \beta_2 \Delta INF_{t-1} + \beta_3 \Delta RTAX_{t-1} + \beta_4 \Delta GDP_{t-1} + ECT_{t-1} + e_t \quad (2)$$

Where: PR is Indonesia's poverty rate (%); RDEBT is additional debt-to-GDP (ratio); INF is inflation (%); RTAX is tax-to-GDP (ratio); and GDP is real GDP (Rupiah);  $\alpha$  is intercept;  $\beta$  is regression coefficients; ECT is error correction term as adjustment coefficient;  $e$  = error term,  $t$  = time.

Second model for The long-run model:

$$GDPC_t = \alpha_0 + \beta_1 RDEBT_t + \beta_2 POP_t + \beta_3 RTAX_t + \beta_4 INF_t + e_t \quad (3)$$

The short-run model:

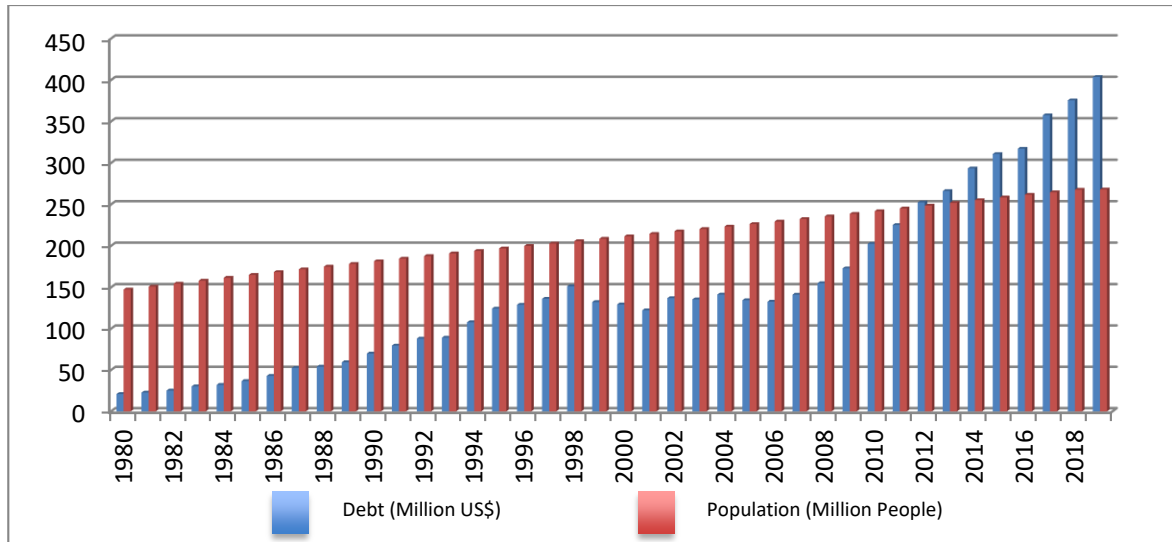
$$\Delta GDPC_t = \alpha_0 + \alpha_1 \Delta RDEBT_t + \alpha_2 \Delta POP_t + \alpha_3 \Delta RTAX_t + \alpha_4 \Delta INF_t + \beta_1 \Delta RDEBT_{t-1} + \beta_2 \Delta POP_{t-1} + \beta_3 \Delta RTAX_{t-1} + \beta_4 \Delta INF_{t-1} + ECT_{t-1} + e_t \quad (4)$$

Where: GDPC is real GDP per capita (Rupiah); RDEBT is additional debt-to-GDP (ratio); INF is inflation (%); POP is total population (persons); RTAX is tax-to-GDP (ratio);  $\alpha$  is intercept;  $\beta$  is regression coefficients; ECT is error correction term as adjustment coefficient;  $e$  = error term,  $t$  = time.

### 3. RESULTS AND DISCUSSION

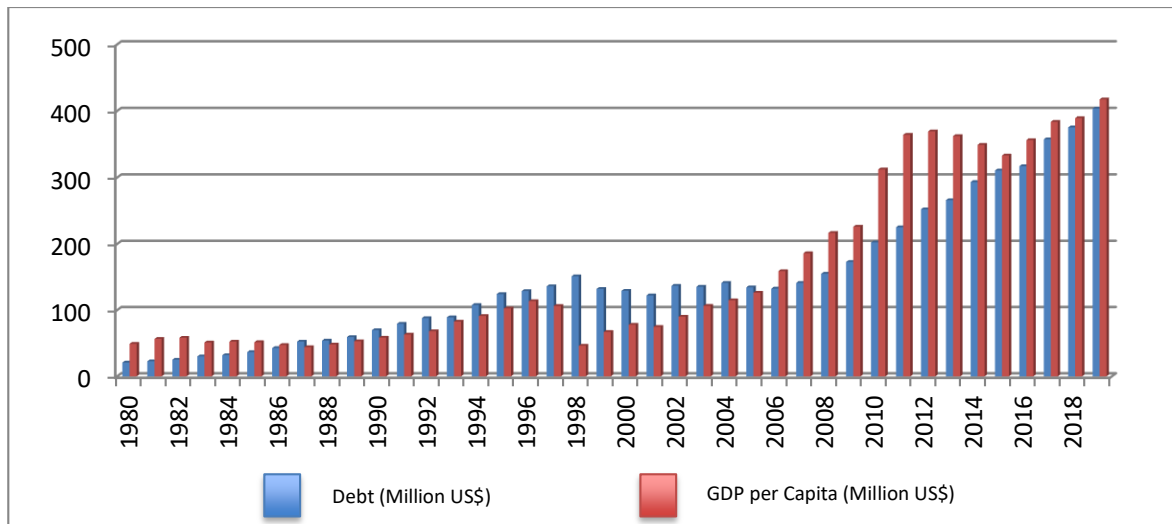
#### 3.1. Brief Description of Government Debt and Social Welfare

Figure 1 show the large debt from bilateral and multilateral to debt securities. Based on data from the largest creditor country for Indonesia is Singapore is 69,353 million US\$ in 2019. The biggest creditor institutions for Indonesia are International Bank for Reconstruction and Development and Asian Development Bank. The total government foreign debt in 2019 is around US\$.403.68 million. In 2019, Indonesia's total debt of IDR.5611.56 trillion is equivalent to 403.68 million in US\$. The composition of government debt in 2019 was 58.7 percent in rupiah and 41.3 percent in foreign currency.



**Figure 1.** Development of Indonesian Debt and Population, 1980-2019

Source: BPS, Bank of Indonesia, Ministry of Finance



**Figure 2.** Development of Debt and GDP per capita of Indonesia, 1980-2019

Source: BPS, Bank of Indonesia, Ministry of Finance

From Figures 1 and 2 it can be seen that Indonesia's debt is increasing every year. The population of Indonesia also continues to increase every year. However, the number of poor people continues to decline, continues to decline and increases every year. Due to the currency crisis or economic pressures during the 1997/1998 period, Indonesia's GDP per capita fell significantly. From the figure, it can be seen that Indonesia's total debt increases every year, while Indonesia's GDP per capita fluctuates every year.

### 3.2. Empirical Result of Model Estimation

First, in this section we present the unit root or stationary test in Table 1, from that test we perform two stages on the level and the first difference to obtain stable data results. A unit root or data stationarity test is performed to see which fixed data is used. Fixed data refers to data with a constant mean and variance over time, and the covariance between time series data, which depends on the time lag between the two periods.

**Tables 2.** Stationary test results equation

Variable	Critical value (%)	ADF-test			
		Level	Prob.	1 <sup>st</sup> difference	Prob.
$\Delta PR$	1%	-4,309		-3,831	
	5%	-3,574	0,228	-3,029	0,000*
	10%	-3,221		-2,655	
$\Delta GDPC$	1%	-4,498		-3,808	
	5%	-3,658	0,520	-3,020	0,001*
	10%	-3,268		-2,650	
$\Delta RDEBT$	1%	-4,309		-4,323	
	5%	-3,574	0,373	-3,580	0,001*
	10%	-3,221		-3,225	
$\Delta INF$	1%	-4,416		-4,532	
	5%	-3,622	0,062	-3,673	0,002*
	10%	-3,428		-3,477	
$\Delta RTAX$	1%	-4,309		-4,416	
	5%	-3,574	0,324	-3,622	0,001*
	10%	-3,221		-3,248	
$\Delta POP$	1%	-3,699		-4,339	
	5%	-2,976	0,553	-3,587	0,028*
	10%	-2,627		-3,229	
$\Delta GDP$	1%	-4,416		-4,874	
	5%	-3,622	0,975	-3,452	0,000*
	10%	-3,248		-3,568	

**Note:** The sign \* is level of significant at 5 percent

**Source:** Secondary Data Processed, 2021

One way to identify fixed data is to check whether the mean, variance, and covariance of the data are constant. From ADF-test at level stage indicate that data used has contains unit root, so that variable used is not stationary. Then we conduct testing again at first difference and result indicate that the variable has no unit root, so that the variable has stationary, this can be seen from the ADF-test more than critical value or probability value less than 0.05.

**Tables 3.** The Results of Cointegration test

For Equation 1				
Hypothesis	trace-statistics	Critical value	Max-Eigen	Critical value
$r = 0^*$	162,381	69,818	74,069	33,876
$r \leq 1^*$	88,311	47,856	52,612	27,584
$r \leq 2^*$	35,699	29,797	25,403	14,264
For Equation 2				
$r = 0^*$	146,63	69,818	75,986	33,876
$r \leq 1^*$	70,656	47,856	43,401	27,584
$r \leq 2^*$	27,254	29,797	30,850	21,131

**Note:** \*significant level at 5%

**Source:** Secondary Data Processed, 2021

In this section we also test the cointegration presented in Table 3, this test we do on equations 1 and 2. Cointegration test is a method used to test stationary combinations of linear variables.

Linear variables are non-stationary variance structures of the time series model and are designed to determine the long-run stability of the variables in the equation. Additionally, the cointegration test conduct for looking at the residual value in the data. The cointegration test detection is seen in the trace and max-eigen statistical tests. If the trace and max-eigen values are more than critical values, then the variables in the equation have cointegration and vice versa. Based on the cointegration test results show that the trace and max-eigen values are more than critical values, it can be stated that equations 1 and 2 have cointegration, meaning that the null hypothesis is rejected.

Detection of the classical assumption violation test in two equations is also presented in Tables 4 and 5. The tests consist of normality, autocorrelation, multicollinearity, and heteroscedasticity tests. based on the test results indicate that the data is normally distributed on the results of the JB-test. The equation model also shows that there is no autocorrelation of the DW-test value. Furthermore, the variance inflation factor also shows that the equation model does not violate the multicollinearity assumption. Finally, the model problem model also shows that heteroscedasticity does not occur, so that equations 1 and 2 applied can be declared the best model.

**Tables 4.** Estimation Result of Equation (1)

Dependent variable: $\Delta PR$				
Variable	Coefficient (Std. Error)	t-Statistic	Prob.	VIF
<i>Long-run Equation</i>				
Constant	43.838*** (5.215)	8.406	0.000	-
$\Delta RDEBT_t$	0.126** (0.059)	2.110	0.045	1.179
$\Delta INF_t$	0.061 (0.041)	1.475	0.152	1.181
$\Delta RTAX_t$	-0.222 (0.267)	-0.832	0.413	2.842
$\Delta GDP_t$	-1.858*** (0.483)	-3.839	0.000	2.770
<i>Short-run Equation</i>				
Constant	-0.308 (0.773)	-0.398	0.693	-
$\Delta RDEBT_t$	0.139* (0.071)	1.961	0.062	1.721
$\Delta INF_t$	0.029 (0.024)	1.190	0.246	1.575
$\Delta RTAX_t$	0.198 (0.292)	0.677	0.504	1.703
$\Delta GDP_t$	-1.747 (3.491)	-0.500	0.621	1.628
$ECT_{t-1}$	0.432** (0.181)	2.380	0.026	1.342
$R^2 = 0,762$ ; Adj. $R^2 = 0,724$ ; Prob F-Stat: 42,428(0,000).				
Diagnostic test		Statistics test		
DW-test		1.866		
Normality test		2.294 (0.772)		
Heteroscedasticity		1.339 (0.274)		

Note: Significant level at \*\*\*1%, \*\*5%, and \*10%

Source: Secondary Data Processed, 2021

The empirical results of the model estimation presented in Table 4 find evidence that in the long-run the debt-to-GDP ratio variable has a significant and positive effect on the poverty rate. This means that the increasing debt-to-GDP ratio will increase poverty rate. These findings support and are in line with studies conducted by Kemal (2001) and Akram (2016). The findings differ on the GDP variable which has a significant and negative effect on the poverty level. These findings support and are in line with studies conducted by Nguyen et al. (2020); Mansi et al. (2020); and Stevans & Sessions (2008). Meanwhile, the tax-to-GDP and inflation variables do not have a significant effect on the poverty level. These findings support and are in line with studies conducted by Rothenberg et al. (2016); and Faisal & Ichsan (2020). The study found that statistically in the short-run the additional debt-to-GDP ratio does not have an impact on the poverty rate. This finding is support and in line with the study by Syaparuddin & Dahmiri (2010), where debt is positively correlated and has an impact on Indonesia's poverty rate. The difference between this study and study conducted by Syaparuddin & Dahmiri (2010) using the variable debt, while in this study using the variable

additional debt-to-GDP ratio. Meanwhile, the result of equation (1) in the short-run of the inflation variable, tax-to-GDP ratio, and GDP are not significant to the poverty level. These findings support and are in line with studies conducted by Rothenberg et al. (2016); and Faisal & Ichsan (2020).

**Tables 5.** Estimation Result of Equation (2)

Dependent variable: $\Delta$ GDPC				
Variable	Coefficient (Std. Error)	t-Statistic	Prob.	VIF
<i>Long-run Equation</i>				
Constant	-45,312*** (1,631)	-27,777	0,000	-
$\Delta$ RDEBT <sub>t</sub>	-0,007** (0,003)	-2,078	0,048	1,185
$\Delta$ POP <sub>t</sub>	10,198*** (0,329)	30,936	0,000	3,241
$\Delta$ RTAX <sub>t</sub>	-0,047** (0,017)	-2,710	0,012	3,354
$\Delta$ INF <sub>t</sub>	0,000 (0,002)	0,228	0,821	1,181
<i>Short-run Equation</i>				
Constant	0,061** (0,023)	2,604	0,015	-
$\Delta$ RDEBT <sub>t</sub>	0,003 (0,002)	1,522	0,141	1,601
$\Delta$ POP <sub>t</sub>	5,876*** (1,051)	5,586	0,000	1,831
$\Delta$ RTAX <sub>t</sub>	-0,002 (0,010)	-0,185	0,854	1,967
$\Delta$ INF <sub>t</sub>	0,001** (0,000)	2,371	0,026	1,430
ECT <sub>t-1</sub>	0,038 (0,109)	0,348	0,730	1,478
R <sup>2</sup> = 0,990; Adj. R <sup>2</sup> = 0,989; Prob F-Stat: 64.319(0,000)				
Diagnostic test		Statistics test		
DW-test		1,632		
Normality test		2.613 (0,291)		
Heteroscedasticity		2,060 (0,114)		

Note: Significant level at \*\*\*1%, \*\*5%, and \*10%

Source: Secondary Data Processed, 2021

Empirical result from Tables 5 found that statistically in the short-run the additional debt-to-GDP had no significant effect on GDP per capita in Indonesia, while in the long-run it had a significant effect on GDP per capita. This findings are also found in study by Butkus et al. (2015); and Spilioti (2015). study them stated that debt-to-GDP has an impact on GDP per capita, this study using the additional debt-to-GDP variable, the findings of equation (2) also looks at the short and long-run effects from the population, tax-to-GDP, and inflation variables. The findings show that in the short-run the population and inflation are significant and positively correlated on the poverty level, but tax-to-GDP ratio had no significant to GDP per capita. Meanwhile, in the long run, the population and tax-to-GDP are significant to GDP per capita. Total population has a positive correlation, while tax-to-GDP has a negative correlation, and we also finds that the inflation variable had no significant on GDP per capita.

#### 4. CONCLUSIONS

The conclusion of this study that in the short-run, additional debt-to-GDP was not significant to the poverty level and GDP per capita. Meanwhile, the long-run, additional debt-to-GDP is significant to the poverty level and GDP per capita. The results also find that in the long run additional debt-to-GDP is positively correlated with poverty levels in Indonesia, meaning that additional debt-to-GDP increases the poverty rate in Indonesia. Meanwhile, for GDP per capita, additional debt-to-GDP has a negative correlation, this means that additional debt-to-GDP reduces GDP per capita in Indonesia. This study also finds in equation 1 that in the short-run inflation, tax-to-GDP, and GDP are not significant to the poverty rate. Meanwhile, the long run, the additional debt-to-GDP ratio and GDP variable is significant to the poverty rate, and has a positif and negative correlation. The findings in equation 2 also looks at the short-run population and inflation are



significant and positively correlated with the poverty level, but tax-to-GDP ratio is not significant on GDP per capita. Meanwhile, the long run, the population and tax-to-GDP are significant to GDP per capita. Total population has a positive correlation, while tax-to-GDP ratio has a negative correlation.

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