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DOES PUBLIC SPENDING REDUCE POVERTY IN INDONESIA?⁷

Public welfare also plays an important role in poverty alleviation. Government expenditure has increased yearly for two decades, followed by a decline in poverty associated with effective and efficient regulation and budget allocation. In this study, we are interested in empirically examining the effect of social spending, health spending, and education spending on poverty in both the short and long term during the reign of the two presidents, namely the period 2005-2023, which has been neglected in exploring poverty reduction in Indonesia. This study uses time series data available on the Central Bureau of Statistics (BPS) Website with an Autoregressive Distributed Lag (ARDL) approach. This study finds evidence that social spending is necessary for increasing public spending that can significantly reduce poverty in Indonesia in both the short and long run. On the other hand, health spending has a negative effect, worsening poverty. Meanwhile, we are still looking for evidence that education spending allocated by the Government significantly reduces poverty in Indonesia in the short and long run.

Keywords: Poverty; Social Expenditure; Health Expenditure; Education Expenditure; distributive policy

JEL: P46; H51; H52; H55

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1. Introduction

Over the last two decades, developing countries have reduced poverty at a rate surpassing developed countries (IMF, 2023). This decline in poverty aligns with the targets set by the United Nations in 2015 to eradicate extreme poverty by 2030, which is defined as living on less than \$1.25 per day. Due to the COVID-19 pandemic and the global economic recession, poverty alleviation has slowed compared to desired levels. In developing countries like Indonesia, the percentage of the population living in poverty as of September 2020 was 10.19 per cent, an increase of 0.41 percentage points from March 2020 and 0.97 percentage points from September 2019 (BPS, 2022). However, overall poverty levels in Indonesia have reportedly decreased over the past two decades (Siswanto, 2022).

After COVID-19, challenges emerged for the Indonesian Government, which had successfully reduced poverty rates over the past two decades. According to BPS data (2020), the poverty rate in 1999 was 24%, which decreased to 9.8% by 2020. The average poverty reduction from 1970 to 1990 was 1.9%, falling to 0.5% between 2002 and 2017 (World Bank, 2020). Amid global and domestic uncertainties, Indonesia's vulnerability to poverty remains relatively high, with 30% of its population classified as poor or vulnerable to poverty (World Bank, 2020).

To alleviate poverty, the Government of Indonesia regulates policies and implements various development programs supported by budget allocations, such as social spending, education, and health. Social spending is recognized as one of the instruments for improving community welfare, income distribution, and poverty reduction. One of the reasons the Indonesian population has not fallen into extreme poverty is social assistance (BPS, 2022). Each year, the Government of Indonesia launches social assistance programs for underprivileged communities. From 2012 to 2018, the realization of social assistance spending ranged from IDR 49 trillion to IDR 97 trillion, with a significant increase in 2019 to IDR 100 trillion. In response to the 2020 health crisis, social assistance spending rose even higher to IDR 200 trillion.

The Indonesian Government has also intervened in the education budget to address poverty, including during the COVID-19 pandemic. In 2020, the education budget amounted to IDR 505.8 trillion, reflecting a 2.7% increase from the previous year, IDR 492.5 trillion, based on data from BPS (2023). Each year, the education budget has experienced growth, with allocations of IDR 549.5 trillion and IDR 608.3 trillion for 2021 and 2022, respectively, and reaching IDR 612.2 trillion in 2023. In this context, the Government aims to break the cycle of poverty, as education has emerged as a key factor in addressing various dimensions of poverty and empowering individuals with the knowledge and skills necessary for the future (Bukhari et al., 2024). Education enhances economic opportunities and contributes to human development, health, and income.

The depiction of fluctuating poverty trends in Indonesia amid surging public spending indicates that poverty is not an entirely static phenomenon (Dercon, Shapiro, 2007). Events such as COVID-19, global uncertainty, economic crises, crop failures, job losses, deaths, and other shocks can hinder poverty alleviation efforts. To assess the impact and effectiveness of Government spending on poverty, Dartanto & Nurkholis (2013) noted that it is challenging

to do so in the short term. For instance, the effects of investments in education and health on household welfare cannot be immediately investigated. Therefore, long-term evaluations to capture the determinants of poverty reduction remain essential for further exploration.

Various approaches, conceptualizations, and models in analyzing poverty can lead to different conclusions regarding the determinants of poverty. For instance, the adopted methodology, the country of focus, and the measure of poverty used are among the determinants of the variations in the findings related to poverty (Balasubramanian et al., 2023). Regarding the chosen poverty measures, some studies adopt a relative poverty measure, focusing on the lower quantiles, while other literature utilizes an absolute poverty measure. For example, this can involve the ratio of the number of heads or the poverty gap based on the international thresholds for extreme poverty (Balasubramanian et al., 2023). Other literature examines poverty from a broader (multidimensional) perspective. Additional measurements employ poverty lines (Ngubane et al., 2023), though these vary by country. Multidimensional poverty studies have recently utilized the Global Correlation Sensitive Poverty Index and the M0 Global (Burchi et al., 2021; Burchi et al., 2022; Balasubramanian et al., 2023).

Research examining the relationship between Government spending, particularly social, education, and health expenditures, and poverty has proliferated in the literature. However, the findings still need to be more conclusive and often contradictory. Some researchers have identified a consistent relationship between social spending and poverty. Celikay & Gumus (2017) found that in the short term, social spending has a negative impact, while in the long term, it has a positive effect. Governments must effectively perform various social functions through expenditure to provide their citizens with a minimum standard of living. Social assistance programs such as cash transfers and subsidies for gas, electricity, water, and public transportation are aimed at low-income households, thereby directly alleviating poverty (Beneke et al., 2017). Social spending is the most fundamental and effective protection against poverty and expenditure (Ibarra et al., 2019; Westmore, 2018). Recent findings by Shehata (2024) reveal that social spending significantly and positively acts as an optimal retributive tool in poverty alleviation.

On the other hand, some researchers have found the opposite. Cammeraat (2020) discovered that public social spending on unemployment, health, housing, family, disability, and elderly care in 22 European Union member countries has a negative impact on poverty. Previous findings by Caminada (2012) have indicated better policies for combating poverty than social spending.

Poverty is measured in terms of income and monetary factors and assessed through education and social integration (Anand, Sen, 1994). Education plays a crucial role in measuring poverty from a multidimensional perspective. Investing in education for human development is essential for alleviating poverty (Tilak, 2020). Quality education in the future plays an indispensable role in job searching and financial success (Bukhari et al., 2024). Awe (2013) and Osundina et al. (2014) found that education spending negatively impacts poverty. The failure to reduce poverty in the long term is attributed to misdirected Government spending on education, which does not effectively contribute to long-term poverty alleviation. The study by Sayyidina and Suparno (2023) reinforces this statement, finding no significant

impact of education budget expenditures on poverty alleviation in the eastern provinces of Indonesia.

Meanwhile, the empirical findings on health spending and poverty remain debated. Rowntree (1901) revealed that poor health can lead to poverty. This condition remains relevant in the 21st century, where poor and extreme health can cause communities to be impoverished (Krishna, 2010). Wherry et al. (2018) found that in the context of long-term poverty alleviation, Government health spending allocation impacts the increased access to healthcare services for pregnant women, infants, and children, enhancing health and the potential for earning a decent income. Mutyambizi et al. (2019) discovered that households without adequate healthcare services would halt children's education and reduce protein food consumption, leading to adverse long-term effects related to decreased productivity in the future. Fadlon and Nielsen (2021) found that good healthcare services in the long term have a positive impact on income and reduce poverty. Low-income communities most quickly feel the effects of healthcare services due to their limited financial protection capabilities (O'Donnell, 2024).

Previous studies have outlined various facts related to the impact of health spending on poverty alleviation. Findings by Thomson et al. (2019) indicate that low-income groups face a greater risk of becoming impoverished compared to high-income groups due to disparities in access to healthcare services. Alam & Mahal (2014) discovered that health shocks in low- and middle-income countries significantly reduce living standards, leading to job losses and decreased productivity, exacerbating poverty. This is attributed to the limited social and health safety nets governments provide to their populations.

Empirical studies on the dynamics and determinants of poverty continue to increase each year, including in Indonesia. The varying findings among these studies still leave room for us to explore them more deeply. Therefore, this research contributes to the body of literature in diverse ways. This study contributes to the literature by exploring the short-term and long-term relationships between social spending, health spending, and education spending on poverty in Indonesia over the last decade, from 2005 to 2023. Our contribution also relates to analyzing and examining which expenditures have the strongest positive and negative relationships with poverty in the short and long term.

2. Materials and Methods

This study uses time series data available on the Central Bureau of Statistics website from 2005 to 2023. The dependent variables are social expenditure (central government budget based on social expenditure [SE]), health expenditure (central government budget based on health [HE]), and education expenditure (central government budget based on education expenditure [EE]). Meanwhile, the independent variable is poverty, measured by the poverty rate (POV) following the research conducted by (Tang et al., 2024). To see the difference in the impact on poverty of the two government regimes, a dummy variable is included in the model with a value of 1 for the SBY administration and 0 for the Jokowi administration.

This study adopts the Autoregressive Distributed Lag (ARDL) Model to examine the short- and long-term impact of the drivers of poverty alleviation. The ARDL model developed by Pesaran & Shin (1995); Pesaran et al. (2001) is more valid and consistent in evaluating time series data for cointegration than alternative cointegration testing techniques. The advantages of the ARDL method are that it can provide accurate estimation results for small and large sample sizes. Odhiambo's (2009) ARDL method allows stationarity at different integration levels, such as I(0) and I(1) or at both, whereas other methods limit the order of integration of the stationarity test. To estimate the effect of poverty determinants in the short run, this study uses the following equation:

$$POV_{it} = \beta_0 + \beta_1 SE_{it} + \beta_2 HE_{it} + \beta_3 EE_{it} + \beta_4 D_t + ECT_{t-1} + \varepsilon_i \quad (1)$$

Meanwhile, the long-run effects of the determinants of poverty use the following estimation equation:

$$\Delta POV_{it} = \beta_0 + \beta_1 \Delta(SE)_{it} + \beta_2 \Delta(HE)_{it} + \beta_3 \Delta(EE)_{it} + \beta_4 \Delta(D)_t + \varepsilon_t \quad (2)$$

POV is household consumption expenditure, SE is social protection expenditure, HE is health expenditure, EE is education expenditure, D is a period dummy, ECT indicates the speed of equilibrium adjustment after the shock, and ε is the error term.

In addition, before estimating the ARDL model, a unit root test is first conducted to verify the stationarity of the variables. Unit root tests using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP), which are commonly used in the literature, have the advantage of showing much structural damage, which can lead to biased results (Sufyanullah et al., 2022). Second, a cointegration test is conducted to verify the relationship of variables in the long run. According to Pesaran et al. (2001), if the F-statistic is greater than the significance value of I(1) and I(0), then cointegration is confirmed, and the relationship is consistent in the short and long run. Third, to test the stability and robustness of the short-run and long-run estimates, this study uses Cusum and Cusumsq plots to ensure that the ARDL model is feasible.

3. Results and Discussion

Table 1 shows the descriptive statistics (mean, standard deviation, minimum, maximum, and skewness). Social spending has an average value of 89503.44 with a standard deviation value of 106710.0. It has a minimum value of 321.0000 and a maximum of 260063.6, which means that government spending generally shows a significant strengthening trend.

Table 1. Descriptive Statistics

Variable	POV	SE	HE	EE
Mean	2.48E+08	89503.44	42652.96	116886.6
Std. Dev	2.79E+08	106710.0	40460.40	60553.33
Min	10438051	321.0000	1273.000	15009.00
Max	6.49E+08	260063.6	139502.1	230728.4
Skewnes	0.353949	0.5048	0.9675	-0.0030
OBS	22	22	22	22

Source: Secondary data processed in Eviews 12 (2024)

Before ARDL estimation, verifying the order of integration is necessary by testing the stationarity of all data included in this study. This test aims to avoid false or invalid relationships between variables to obtain economically valid regression estimates. The ARDL model has the advantage of assuming that variables can have different levels of stationarity (Pesaran et al., 2001). This study uses Augmented-Dickey-Fuller (ADF) and Phillips-Perron (PP) to test the stationarity of time series data.

Table 2. Stationarity Test

Variable	Stationer	ADF	PP
POV	Level	-1.0840	-1.0824
	First Difference	-5.4444***	-4.9597***
SE	Level	-0.2073	-0.1694
	First Difference	-4.1493***	-4.1494***
HE	Level	-0.8400	-0.5484
	First Difference	-4.0679***	-4.9105***
EE	Level	0.0970	-1.5262
	First Difference	-6.9214***	-18.0570***

Source: Secondary data processed in Eviews 12 (2024).

Table 2 shows that all variables in this study are stationary, using both ADF and PP at the same level. These variables of poverty, social spending, health spending, and education spending are not stationary at this level, but these significant ones are not stationary at first. Based on the stationary test results, all variables are stationary at the first difference so that the ARDL model can estimate short-term and long-term relationships. Therefore, to obtain valid and consistent results, a cointegration test must be conducted (Sufyanullah et al., 2022).

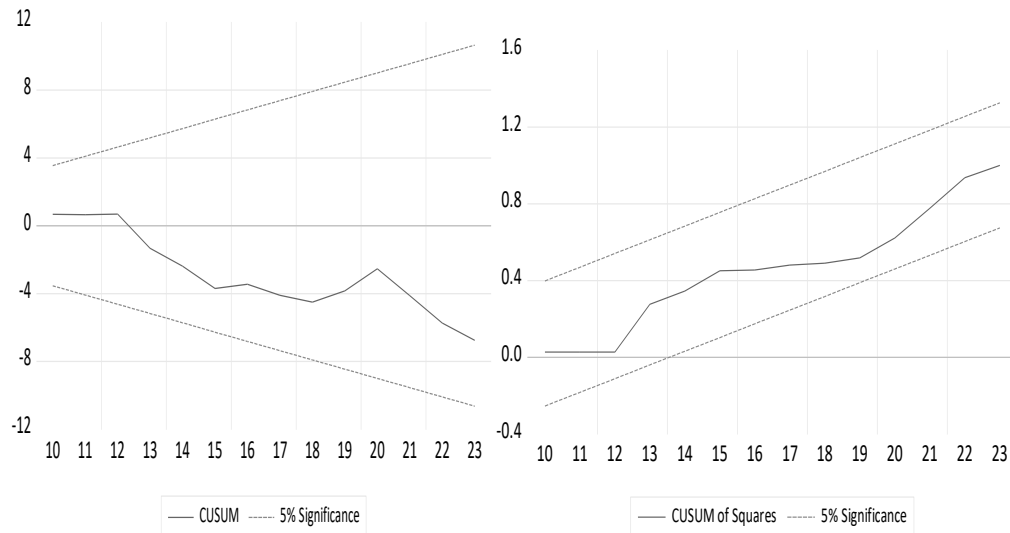
Table 3. Cointegration Test

F-Bounds Test	Value	Significant	I(0)	I(1)
F-Statistic	14.5001	10%	2.45	3.52
		5%	2.86	4.01
		2.50%	3.25	4.49
		1%	3.74	5.06

Sumber: Data sekunder yang diolah di eviews 12 (2024).

Table 3 shows the results of the ARDL cointegration test based on the F-statistic. The F-statistic value of 14.5001 with a significance level of 1%, 2.5%, 5%, and 10% exceeds the upper critical limit value, so it can be concluded that the variables of poverty, social spending, health spending, and education spending have a long-run equilibrium cointegration relationship in this study. This finding suggests that cointegration is present when estimating the research model. Furthermore, this result also verifies the stability of the long-run model coefficients using Cusum and Cusumsq.

Figure 1. Stability Test Results



Source: Secondary data processed in Eviews 12 (2024)

The stability test results of the Cusum and Cusumsq statistical plots found that our model is structurally stable, as shown in Figure 1 above. The values do not exceed the crucial limit at a 5% significant level, so there is no sudden structural change. The ARDL model will be stable in the long run with no change over time as the cumulative sum and residuals are within the 95% confidence interval. Therefore, from the previous tests, it is evident that the ARDL model is suitable for estimating this study's short-term and long-term relationships.

Based on the ARDL estimates in Table 4, the social expenditure (SE) variable has a short-term coefficient of -0.0006 and a long-term coefficient of -0.0006, statistically significant at the 5% level concerning poverty reduction in Indonesia. Increasing one basis point in social expenditure (SE) will reduce poverty by 0.0006 units in the short and long term. These findings are consistent with the research by Westmore (2018), Ibarra et al. (2019), and Shehata (2024), indicating that social investment assists both urban and rural populations, particularly women and children, in escaping poverty in South Africa (Mndebele, Kaseeram, 2023), where the poverty rate decreases by about five percentage points in the long term and improves living standards in the Philippines (Tang et al., 2024).

The Government has effectively used the social budget to target poverty reduction. Formal and informal social support is essential for communities to reduce overall poverty. The Government has played an important role in allocating social spending programs that act as a safety net for people marginalized by social factors and limited income. The accumulation of these positive impacts can significantly affect the overall well-being of individuals, especially in the context of poverty. Social spending factors are relevant in reducing short-term and long-term poverty.

Over time, in the long run, the expansion of social safety nets can improve the living standards of the poor and expand their opportunities for decent work. Social spending in any policy is essential to alleviate the social and economic burdens that groups vulnerable to poverty face. This highlights the importance of expanding social assistance for basic needs and other needs to improve people's skills and knowledge informally. However, implementing social assistance needs to be supported by accurate data to avoid negative impacts that could potentially alienate those who are not beneficiaries (Nawaz, Hussain, 2024).

The Government has been working to expand the reach of formal assistance services to improve direct accessibility. Therefore, the Government needs to provide information services and digitalize the distribution of social assistance to obtain accurate data on the poor quickly. This will help reduce poverty and lead to a more effective and targeted policy formulation, bringing hope and optimism to the stakeholders.

Table 4. Short-term and long-term ARDL Estimation Results

Short-term	Coefficient	Standard-Error	T-Stat	Prob.
SE	-0.0006	0.0001	-4.5245	0.0009
HE	-0.0006	0.0002	-2.2809	0.0435
EE	-0.0006	0.0002	-2.9194	0.0140
ECT(-1)	-1.0142	0.1020	-9.9430	0.0000
Dummy	89.6778	25.2746	3.5481	0.0046
C	-76.9772	23.0082	-3.3456	0.0065
Long-term	Coefficient	Standard-Error	T-Stat	Prob
SE	-0.000677	0.000151	-4.483241	0.0009
HE	-0.000593	0.000288	-2.062302	0.0636
EE	-0.000655	0.000239	-2.746224	0.0190
Dummy	88.41898	25.79555	3.427684	0.0056

Source: Secondary data processed in Eviews 12 (2024).

Meanwhile, the health expenditure variable (HE) found that in the short run, the coefficient is -0.0006 and probably significant at a 54% level. In the long run, it has a coefficient of 0.005 and is significant at a 10% level in reducing poverty in Indonesia. Every one basis point increase in health spending by the Government will reduce poverty, which means that the more effective Government spending on health will reduce poverty. This finding is reinforced by Fadlon and Nielsen's (2021) research, which states that all health services can be felt by the poor. In a country like Indonesia, health spending significantly impacts poverty. The poverty measure based on the percentage of poor people set by the Government adequately reflects the fundamental impact of addressing this issue. Reducing barriers to accessing Government health services is an important factor that pushes many of the poor out of poverty, as they will allocate some of their income to other needs. The increase in Government spending on health services has a direct and urgent impact on poverty reduction. There has been congruence in this situation, and the community feels the impact directly in the short and long term.

Government spending on health in Indonesia has benefited people below the poverty line. Several factors contribute to this. Firstly, the construction of health facilities aims to facilitate access for the poor. Second, health insurance or the health system covers all health services,

including certain medicines and treatments. Third, health insurance or health systems cover medicines, and treatments cover health services. Fourth, all poor people are covered by health insurance because the Government's data is inaccurate. People not covered by health insurance can also access insurance even if they cannot afford the premiums because the Government covers the costs.

These groups are very vulnerable and have the potential to suppress non-medical consumption for the urgency of medical consumption, pushing them further below the poverty line. While health insurance can protect against the significant financial risks associated with health shocks (Argys et al., 2020) and contribute to reducing poverty levels (Ramna et al., 2024), this calls for a comprehensive and equitable health insurance scheme for urban and rural communities. Fourth, there is a lack of health facilities in rural and remote areas prone to poverty, so people buy medicine directly from the nearest pharmacy. Poor people in rural areas spend more money on medicines than those in urban areas (Sangar et al., 2019). The current government has yet to focus on health services in rural areas; the number of poor people in rural areas is much greater than in urban areas. In Indonesia in the 1990s, income loss was the most significant cause of economic burden due to health shocks (Gertler, Gruber, 2002).

Furthermore, the education expenditure (EE) variable, with a coefficient of 0.0006 for both short-run and long-run, is significant at Indonesia's 5% level of poverty. This finding highlights that Government spending on education has empowered individuals with the necessary knowledge and skills to overcome the cycle of poverty. The overall allocated education spending impacts improving economic opportunities, social cohesion, development, or poverty in Indonesian society. Public authority policies related to education play an important role in realizing high-quality education that impacts poverty alleviation. It is generally agreed that education is one of the most effective tools to alleviate poverty, reduce inequality, and improve global competitiveness (Tilak, 2020). However, the Government has targeted the beneficiaries of the education expenditure budget to reduce poverty directly for people experiencing poverty.

The results of this study show that the Government has succeeded in overcoming the barriers that hinder people's access to quality education services. These efforts include fulfilling the right of children and adolescents to acquire the knowledge and skills needed to succeed in real life. Although the development of education infrastructure and the availability of physical and non-physical facilities and infrastructure have increased significantly, it shows that the Education budget is evenly distributed to pockets of poverty. The Education budget has been directly targeted at those locations of poverty, generally in peri-urban and rural areas. Consequently, low-income communities now have easier access to education services, including basic education, thanks to various conveniences and accessibility provided by the Government. Examples of this are the proximity between home and school, the availability of diverse and timely transportation alternatives, and the significant relief of financial burdens through the provision of other supporting costs free of charge. This enables the poor in peripheral areas to enjoy quality education services, improving their competitiveness.

The provision of educational scholarships that have been prioritized by the Government (SBY-Jokowi) over the past two decades, including the Ministry of Education and Culture's

KIP-Kuliah, the Indonesia Smart College Card for high school graduates targeting poor families, has significantly reduced poverty. This condition is also triggered by the availability of accurate data on the poor and budget support for targeted educational scholarships. This confirms that poverty alleviation measures through distributive policies have succeeded due to good governance and appropriate targeting, and problems in implementing program schemes can be resolved properly. Based on the findings of the short-term and long-term coefficients, the direction of the trend is positive. However, more encouragement is needed from the Government to spend the budget effectively and on target to impact poverty alleviation. Accurate data on poor families and those potentially falling into poverty is urgent for future poverty reduction programs.

The post-two-decade test dummy variable is statistically highly significant positive, meaning there is a decrease in poverty during the SBY-Jokowi administration, in the short term with a prob of 0.0046 and the long term with a prob of 0.0056. Meanwhile, the coefficient for the dummy variable of 89.6 per cent is associated with a poverty reduction of one per cent in the short term and 88.4 per cent in the long term in overcoming poverty in Indonesia. This shows that the allocation of expenditure is more effective and efficient in terms of governance and policies taken in allocating social, health, and education, which contribute more to poverty alleviation in Indonesia.

The poverty reduction programs that have been implemented previously include the Urban Poverty Reduction Project (P2KP) with the strategy of empowering poor communities at the rural level, The Askeskin program, which provides insurance to the poor, and The program aims to overcome fiscal disparities between regions by providing more funds to poor regions and the Direct Cash Transfer (BLT) program. These poverty reduction programs are aimed at reducing inequality by combining distributive policies. However, they have the potential to sacrifice long-term growth with policies that increase per capita income. Meanwhile, the coefficient of -1.0142 for $ECT(-1)$ is statistically significant and negative, so there is cointegration between variables. Changes in poverty variables are corrected by -1.0142 in the short term but faster in adjusting the equilibrium in the long term.

4. Conclusions

This study aims to explore the short- and long-term effects of social, health, and education expenditures on poverty in Indonesia over the period 2005-2023. In the short and long run, social spending can reduce poverty in Indonesia by increasing household consumption. On the other hand, this study's short- and long-term findings show that health spending hinders poverty reduction. Meanwhile, education expenditure is not statistically significant in the short and long run and does not contribute to reducing poverty in Indonesia.

Another finding is that the political leadership of the SBY and Jokowi eras is significant in short-term and long-term poverty alleviation in Indonesia. These empirical findings provide significant insights and implications for reducing the impact of poverty alleviation. The Indonesian Government needs to establish a solid regulatory and policy framework to promote sustainable poverty alleviation. Poverty measurement should generate information on multidimensional poverty measures, which can facilitate understanding the experiences

of those living in poverty to design holistic and creative poverty reduction strategies. This study has limitations because it uses time series data from two Government administrations. Therefore, it is recommended that future research be conducted using panel data analysis for each province or district and adding other Government budget variables.

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