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Research article

Does Government Spending Reduce Poverty in Local Economies? A Dynamic GMM Analysis

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ABSTRACT

Poverty has been a challenge for economic development in various regions in Indonesia. This study offers empirical insights into the effectiveness of fiscal policy as a strategic development instrument in reducing poverty. This study investigates the impact of local government spending on poverty alleviation in Jambi Province, addressing a critical challenge in regional economic development. We specifically examine the effects of expenditures on health, education, and economic functions on poverty levels. Utilizing panel data from 11 districts and cities in Jambi Province between 2016 and 2023, we employ a dynamic Generalized Method of Moments (GMM) model for robust analysis. Our empirical results indicate that health and economic function expenditures significantly reduce poverty levels. Conversely, while education spending exhibits a negative correlation with poverty, this effect is not statistically significant. These findings highlight the importance of optimizing regional budget allocations, particularly towards health and economic programs, as a practical implication for effective poverty reduction strategies in Jambi Province. This research contributes to understanding the nuanced role of local fiscal policy in addressing poverty in decentralized contexts.

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1. INTRODUCTION

Poverty continues to be a formidable global economic challenge, especially within developing nations, as highlighted by Amri et al. (2024). A significant portion of the population in these countries struggles to access essential services like education and healthcare, and to find sustainable employment. Consequently, effective public expenditure is widely recognized as a crucial policy tool for tackling these issues and alleviating poverty (Amri et al., 2023). Strategic government spending on vital sectors such as healthcare, education, and economic services can significantly enhance public welfare. These sectors are instrumental in fostering human capital development and economic empowerment, acting as fundamental catalysts for long-term poverty reduction. Poverty remains a widespread challenge in various regions in Indonesia, including Jambi Province. Even with sustained economic growth, poverty remains a significant macroeconomic problem in the regions. The local government has implemented various fiscal policies, such as allocating public spending to health care, education, and economic services, to reduce poverty. However, despite recording a strong gross regional domestic product (GRDP) growth rate of 4.7% in 2022 (BPS Jambi, 2023), Jambi Province still reported a poverty rate of 7.82% in the same year (Amri & Fitri, 2024; and Amri et al., 2024). These rates highlight the critical need for a more thorough understanding of how effective public spending is in combating poverty within Jambi. Therefore, an empirical analysis exploring the relationship between government expenditure in these crucial sectors and poverty reduction is highly warranted.

Several studies have explored the impact of public spending on poverty alleviation, with many underscoring the significance of sector-specific expenditure in reducing poverty levels (Gupta et al., 2002; and Fan et al., 2004). For instance, empirical research by Tang et al. (2024) utilizing Philippine economic data, revealed that government spending on cash transfers can significantly reduce poverty. Similarly, a previous empirical study by Siburian (2022) demonstrated that government spending considerably lowers poverty rates. Consistent with these findings, Wang et al. (2023) observed that government spending on rural infrastructure development in China also contributed substantially to reducing poverty rates. Conversely, other empirical studies indicate that not all forms of government spending have a uniformly positive impact. Shen et al. (2018) revealed that in low-income countries, the effect of government spending on poverty is often weak or inconsistent, particularly when expenditures are directed towards unproductive administrative consumption or subsidies. Hidalgo-Hidalgo & Iturbe-Ormaetxe (2018) further emphasized that only productive and sustainable public expenditure—such as investment in human capital and infrastructure—has a long-term effect on poverty reduction. Given these varied findings, the influence of government spending on poverty reduction remains an open question with inconsistent conclusions. Therefore, examining the direction and significance of the relationship between poverty and government spending is crucial. Moreover, much of the existing research does not specifically categorize government spending by its functional use. In other words, studies focusing on the effects of government spending disaggregated by functional classification—such as healthcare, education, and economic services—at the provincial level remain relatively scarce, particularly within the Indonesian context. Addressing this research gap is essential for developing more effective fiscal policies aimed at poverty reduction.

Public expenditure on healthcare is widely recognized as a critical driver of poverty reduction. By enhancing access to medical services, reducing disease burdens, and improving labor productivity, it directly contributes to better living standards. In Indonesia, for example, empirical evidence suggests that increased healthcare funding has significantly improved maternal and infant health outcomes (Ministry of Health, 2022). Similarly, investment in education fosters skill development and expands economic opportunities, thereby enabling individuals to break free from the cycle of poverty. The high literacy rate in Jambi Province, recorded at 98.36% in 2022 (BPS Jambi, 2023), underscores the potential of education-related public spending in enhancing societal welfare. Furthermore, government expenditure on economic services—such as infrastructure development, agricultural support, and industrial promotion—plays a crucial role in stimulating economic activity and creating employment opportunities, ultimately contributing to poverty alleviation.

This study addresses a critical research gap by providing a focused analysis of the impact of functionally classified government spending—specifically in healthcare, education, and economic services—on poverty reduction at the provincial level within Indonesia. While previous research has examined the general relationship between public expenditure and poverty, the novelty of this study lies in its granular examination of sector-specific spending in the context of Jambi Province, a crucial but underexplored regional economy. Therefore, the purpose of this research is to offer empirical evidence that can guide policymakers in optimizing public resource allocation to foster inclusive economic growth and achieve sustainable poverty alleviation.

To empirically assess the impact of government spending on poverty reduction, this study employs a dynamic generalized method of moments (GMM) estimation approach. This method is particularly suitable for addressing endogeneity concerns and capturing the persistence of poverty over time, as poverty levels in a given period are often influenced by those in preceding periods. The application of this dynamic modeling framework ensures robust and reliable estimation results (Arellano & Bond, 1991; and Blundell & Bond, 1998). Utilizing panel data spanning from 2010 to 2022, this study provides a comprehensive analysis of the effects of government spending on healthcare, education, and economic services on poverty levels in Jambi Province. Additionally, We aim to inform policy debates and enhance the formulation of targeted interventions to reduce poverty at the regional level. The remainder of this article is structured in section two detailing the methodology; section three, presenting the results and discussion; and section four, concluding with a summary of the findings and policy implications.

2. RESEARCH METHODS

2.1. Data

This study utilizes panel data collected from 11 regencies and cities across Jambi Province, covering the period 2016–2023. Our analysis focuses on two primary operational variables: the poverty rate as the dependent variable and government expenditure as the independent variable. The poverty rate is specifically proxied by the ratio of the number of poor individuals to the total population, expressed as a percentage. Government expenditure is disaggregated into three key functional areas: health, education, and economic functions. The description of the variables is presented in Table 1 as follows.

Table 1. The Variables Description

Variable	Description	Source
Poverty rate (Pov)	The poverty rate is proxied by the ratio of the number of poor individuals to the total population (expressed as a percentage)	Indonesian Statistics (BPS)
Health expenditure (GSHF)	Health expenditure refers to the realization of regional budget (APBD) allocations for health programs, including the provision of medicines and medical supplies, individual and public health services, family planning, health research and development, and other related services, which is measured in thousands of rupiah per capita	Ministry of Finance of the Republic of Indonesia
Education expenditure (GSEF)	Education expenditure represents the APBD allocation for financing education services under the responsibility of local governments, covering educators' salaries but excluding official training education budgets, which is measured in thousands of rupiah per capita	Ministry of Finance of the Republic of Indonesia
Economic expenditure (GSEC)	Economic expenditure refers to the APBD realization allocated for the development of public infrastructure and job creation to enhance local economic activities, which is measured in thousands of rupiah per capita.	Ministry of Finance of the Republic of Indonesia

2.2. Model Specification

To analyze the functional relationship between the variables, with the poverty rate as the dependent variable, we acknowledge the potential for high correlation between the poverty rate in a given period and its lagged values. Numerous studies have indeed demonstrated this temporal association (Wang et al., 2021; and Alao & Alola, 2022). Consequently, a dynamic model that incorporates lagged values as predictors for endogenous variables is essential. The GMM is well-suited for this purpose (Romilio & Torrecillas, 2018; and Laverde-Rojas & Correa, 2019), and thus, we apply the dynamic GMM model as our analytical tool. However, applying GMM has limitations, particularly concerning potential endogeneity issues (Ullah et al., 2018). To address this, an instrumental variable (IV) approach is crucial (Wooldridge, 2002). Arellano & Bond (1991); and Blundell & Bond (1998) suggest that the lagged values of the dependent variable serve as superior instrumental variables compared to external ones, as they satisfy the conditions of relevance and homogeneity (Li et al., 2021). Therefore, our GMM model employs lagged poverty rates as instrumental variables, which are econometrically formulated as follows:

$$Pov_{it} = \alpha + Pov_{i(t-1)} + \beta_1 lnGSHF_{it} + \beta_2 lnGSEF_{it} + \beta_3 lnGSEC_{it} + \mu_{it} \quad (1)$$

The symbols in the equation are defined as follows: Pov_{it} represents the poverty rate in district/city i during period t, while $Pov_{i(t-1)}$denotes the lagged value of Pov_{it}, referring to the poverty rate in the same district/city in the previous period; $lnGSHF_{it}$ represents the logarithmic value of realized health function expenditures in district/city i during period t; $lnGSEF_{it}$ indicates the logarithmic value of realized education function expenditures in district/city i during period t; and $lnGSEC_{it}$ denotes the logarithmic value of realized economic function expenditures in district/

city i during period t. Furthermore, α is the estimated coefficient of $lnPov_{it}$, while β_1, β_2, and β_3 are the estimated coefficients of $lnGSHF_{it}$, $lnGSEF_{it}$, and $lnGSEC_{it}$it, respectively. Lastly, μ represents the error term. Hypothesis concluded from the influence of health, education, and economic function expenditure on poverty levels. If $\beta \neq 0$ with a p-value < 0.05, statistically this indicates that the realized expenditure on health, education, and economic functions has a significant impact on the poverty rate. Conversely, if $\beta = 0$ with a p-value > 0.05, this implies that the impact of expenditure on health, education, and economic functions on poverty is not statistically significant.

3. RESULTS AND DISCUSSION

3.1. Result

The research findings reveal significant variations in poverty levels and the realization of public expenditures on health, education, and economic functions across the districts and cities of Jambi Province. While some regions exhibit relatively high poverty rates, others have comparatively low levels. Similarly, public spending across these functional areas also differs considerably. For instance, an analysis of poverty levels shows a maximum poverty rate of 12.76%, a minimum rate of 2.76%, and an average poverty rate of 7.76%. These figures indicate that several regions, such as Tanjung Jabung Barat and Tanjung Jabung Timur, experience poverty rates above the provincial average. Conversely, areas like Sungai Penuh City and Muaro Jambi District report below-average poverty rates. Regarding public expenditure on health functions, the highest recorded value is IDR 1,572.03 thousand per capita, with the lowest at IDR 244.89 thousand per capita. The average realized spending on health functions amounts to IDR 604.79 thousand per capita. A more detailed overview of these descriptive statistics is presented in Table 2.

Table 2. The Result of Descriptive Statistics

Statistics	Poverty rate (%)	Government spending by function (IDR.000 per capita)		
		Health (GSHF)	Education (GSEF)	Economic (GSEC)
Mean	7.759	604.79	1,057.53	432.31
Median	8.330	575.19	1,001.02	282.87
Maximum	12.760	1,572.03	2,473.75	1,855.12
Minimum	2.760	244.89	220.21	51.56
Std. Dev.	2.632	210.55	328.74	355.84
Obs	88	88	88	88

Table 2 further details the average realization of public spending on education functions, amounting to IDR 1,057.53 thousand per capita, with a maximum of IDR 2,473.75 thousand and a minimum of IDR 220.21 thousand per capita. These three descriptive statistical parameters clearly illustrate the disparities in education expenditure across Jambi's districts and cities. Some regions allocate notably high expenditures to education, while others allocate significantly less. Similarly, local government expenditures on economic functions also vary across districts and cities. The highest recorded expenditure on economic functions reaches IDR 1,855.12 thousand per capita, while the lowest is IDR 51.56 thousand per capita. On average, the realized spending on economic functions is IDR 432.31 thousand per capita. These statistical findings reinforce the observation that certain regions in Jambi Province allocate relatively large expenditures to economic functions, while others allocate considerably lower amounts.

The next step involves testing the stationarity of each variable to avoid spurious regression, which can lead to biased and invalid estimates. Therefore, this study conducts a panel unit root test on the main variables: the poverty rate (Pov), and the natural logarithm of government spending on health function, education function, and economic function. We employ four widely used methods from the literature: Levin, Lin, and Chu (LLC); Im, Pesaran, and Shin (IPS); ADF-Fisher; and PP-Fisher. Each method utilizes different approaches and assumptions to detect the presence of unit roots. By

applying them simultaneously, we aim to obtain more comprehensive conclusions regarding the integration characteristics of the panel data. The results of these tests are presented in Table 3.

Table 3. The Result of Unit Root test

Variables	Test for a Unit Root in	Methods			
		LLC	IPS	ADF-Fisher	PP-Fisher
Δ(Pov)	Level	-3.359***	-0.531	23.048	38.388***
	First differences	-4.387***	-0.346	20.537	56.346***
Δ(lnGSHF)	Level	-5.298***	0.028	22.113	38.296**
	First differences	-8.012***	-0.816	27.644	75.229***
Δ(lnGSEF)	Level	-2.539***	0.318	24.664	76.004***
	First differences	-0.547	-1.253	32.252*	136.996***
Δ(lnGSEC)	Level	2.742	0.460	24.476	14.999
	First differences	-1.377*	-0.872	29.472	65.030***

Note: The asterisk *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively

Table 3 reports that most of the variables tested are non-stationary at level, but become stationary after the first differentiation. For the poverty rate, the LLC and PP-Fisher test show significance at the 1% level, indicating a stationary nature, while IPS and ADF-Fisher are not significant. After the first differentiation, only the PP-Fisher method remained significant. Meanwhile, the $\ln\mathrm{GSHF}$ shows significant results at the level according to the LLC and PP-Fisher tests, and all methods become significant after the first differentiation, which strengthens the indication that this variable is integrated at order one $(I(1))$. For the $\ln\mathrm{GSEF}$, the test results at the level show that only LLC and PP-Fisher are significant, while other methods are not. After differentiation, only PP-Fisher shows strong significance. The $\ln\mathrm{GSEC}$ does not show stationarity at levels based on all methods, but after the first differentiation, the results of the PP-Fisher test are significant at the 1% level and LLC shows marginal significance at the 10% level. Based on these findings, the researcher concluded that most of the variables were $I(1)$ and then used the GMM approach in estimating the model.

Table 4. The Estimation Result of GMM Dynamics Model

Dependent variable: $\mathrm{Pov}_{\mathrm{it}}$			
Variables	**Description**	**Coefficient**	**t-Statistic**
$Pov_{i(t-1)}$	Lag poverty rate	0.296** (0.091)	3.228
$lnGSHF_{it}$	Health spending	-0.613** (0.137)	-4.487
$lnGSEF_{it}$	Education spending	-0.190 (0.305)	-0.623
$lnGSEC_{it}$	Economy spending	-0.084** (0.035)	-2.385
Hansen test	*J-statistic*	*Prob.*	
	10.838	0.146	
Arellano-Bond AR test	*AR(1)*	*AR(2)*	
	-2.778 (0.006)	-1.295 (0.195)	
Wald test	*F-statistic*	*Chi²*	
	282.755 (0.000)	1,131.019 (0.000)	

Note: The asterisk *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

As presented in Table 4, we use the dynamic generalized method of moments to estimate the impact of public expenditures on health, education, and economic functions on poverty levels. This model was chosen because statistical results confirmed its freedom from autocorrelation and its satisfaction of validity and reliability requirements, ensuring robust and accurate estimates. The dynamic GMM model demonstrates a Hansen p-value greater than 0.05, indicating its robustness in predicting relationships among variables. Furthermore, a Wald test with a chi-square *p*-value less than 0.05 suggests a high degree of accuracy in the estimated results. The p-values for AR(1) and AR(2) are less than 0.05 and greater than 0.05, respectively. This implies the presence of first-order correlation but the absence of second-order correlation, which are necessary conditions for the goodness of fit of the dynamic panel model (Arellano & Bond, 1991).

The estimation results reveal a one-way causal relationship in poverty levels with a one-period lag in the time series data. This is reflected by the estimated coefficient, underscoring the strong persistence of poverty. Specifically, a 1% increase in poverty in the previous period (lagged) leads to a 0.296% rise in poverty in the current period, highlighting the inertia of poverty over time. Empirical findings also indicate that regional government spending on health plays a pivotal role in alleviating poverty. Health expenditure shows a statistically has negative sign and significant effect on poverty levels, meaning a 1% increase in health spending leads to a 0.613% reduction in poverty rates. This emphasizes the critical role of public health investment in enhancing social welfare and economic resilience. Regions with higher health expenditure tend to experience lower poverty rates, suggesting that well-targeted health investments can effectively alleviate poverty.

Unlike health expenditure, regional government spending on education does not significantly reduce poverty levels, as indicated by an estimated coefficient of -0.190 with a *p*-value greater than 0.05 at significance level. Although education spending has a negative and insignificant effect, suggesting that an increase in education expenditure does not substantially contribute to reducing the number of impoverished individuals. Conversely the findings indicate that government expenditure on economic functions plays a crucial role in poverty alleviation. The estimation results show that economic function expenditure a statistically has negative and significant effect on poverty levels, reflected by an estimated coefficient of -0.084 with a *p*-value less than 0.05 at significance level. This implies that a 1% increase in the regional government's budget allocation for economic functions leads to a 0.084% reduction in poverty levels. This effect underscores the importance of fiscal policies aimed at fostering economic development through targeted public spending.

3.2. Discussion

The findings of this study reveal a causal relationship between the poverty rate in a given period and that of the previous period. This statistically significant result suggests that past poverty rates play a crucial role in shaping current poverty levels. The observed positive and significant influence of the cross-time poverty rate indicates that poverty is, to some extent, self-perpetuating. In the context of districts and cities within Jambi Province, this finding implies that regions with relatively high poverty rates in one period will likely experience similarly high rates in the next. These results align with the study by Wang et al. (2021), which analyzed panel data from Sub-Saharan African countries and similarly found that poverty levels are significantly influenced by their lagged values. This reinforces empirical evidence suggesting that poverty is self-perpetuating, with past conditions exerting a positive and statistically significant impact on current levels. Furthermore, our findings are consistent with the research by Runtunuwua & Tanjung (2020), who also confirmed a self-reinforcing effect in poverty at a one-period lag. Their study demonstrated that an increase in poverty at period *t* has a positive and significant influence on poverty levels in the subsequent period, further supporting the argument that poverty is a dynamic and persistent phenomenon requiring sustained and targeted policy interventions to break the cycle.

This persistence effect implies that poverty is structurally entrenched, potentially due to factors such as limited access to economic opportunities, intergenerational transmission of poverty, or inadequate policy interventions that fail to disrupt the cycle of deprivation. The magnitude of the coefficient (α=0.296) indicates that while poverty levels don't completely carry over from one period to the next, a substantial portion of past poverty persists, reinforcing the challenge of poverty alleviation. Furthermore, the significance of this coefficient underscores the necessity for targeted policies that address not only immediate economic hardships but also long-term structural barriers. Without strategic interventions—such as inclusive economic policies, education reform, and social safety nets—the self-reinforcing nature of poverty may perpetuate economic inequality and slow overall development. Therefore, understanding this dynamic is crucial for designing effective poverty reduction strategies that break the cycle rather than merely mitigating its symptoms.

The results of the GMM dynamic model estimation in Table 4 indicate that regional government spending on health is consequential in alleviating poverty. This finding underscores the critical role of public health investment in enhancing social welfare and economic resilience. Regions with higher

health expenditures tend to experience lower poverty rates than those with lower spending, suggesting that well-targeted health investments can serve as an effective poverty alleviation strategy. These findings align with the study by Witta et al. (2022), which analyzed districts and cities in West Sumatra and similarly concluded that government health expenditure significantly contributes to poverty reduction. The results reinforce the broader theoretical perspective that improved healthcare access and services can enhance human capital, increase productivity, and ultimately foster economic growth while mitigating poverty. This evidence highlights the need for policymakers to prioritize and optimize health sector allocations to achieve more equitable and sustainable socioeconomic development.

Beyond its direct impact on poverty reduction, increased health expenditure also generates long-term economic benefits by improving overall human capital. Enhanced healthcare access leads to lower disease burdens, reduced absenteeism in the workforce, and increased labor productivity. Collectively, these factors contribute to higher household incomes and greater economic mobility. Furthermore, investments in preventive and curative healthcare services can alleviate financial shocks caused by medical expenses, particularly for low-income households, thereby reducing their vulnerability to falling into poverty. These dynamics highlight the multidimensional role of health expenditure, not only as a social protection mechanism but also as a strategic economic driver. As such, policymakers should consider integrating health investment strategies with broader economic development policies to maximize their poverty-reducing effects while fostering inclusive growth. In the regional government budget, health expenditure is allocated to support the primary function of local governments in providing healthcare services to the public. Operationally, this function is realized through the provision of medicines and medical supplies, individual and public health services, family planning programs, health research and development, and other healthcare-related initiatives. Increased health spending can enhance the overall quality of public health, which in turn improves individuals' capacity to engage in productive economic activities. The improvement in economic activities resulting from better health conditions directly leads to higher incomes and an overall enhancement in community welfare. This causal mechanism explains the significant impact of healthcare spending on poverty reduction. In contrast to the impact of health expenditure on poverty, regional government spending on education does not significantly reduce poverty levels.

Meanwhile, education spending does show a negative and statistically insignificant effect, suggesting that increased education expenditure does not substantially contribute to a reduction in the number of impoverished individuals. This finding aligns with Sayyidina & Iranto (2023), who utilized panel data from 13 provinces in eastern Indonesia and similarly found that government spending on education had an insignificant effect on poverty reduction.The allocation of the regional government budget for education tends to finance basic educational provisions, including teacher salaries, but often excludes funding for vital life-skill training programs. Although increased education spending is expected to enhance education quality and ultimately raise living standards, the impact on societal well-being does not occur within the same time frame but requires a time lag. This delay stems from two key factors: first, the development of educational facilities and infrastructure funded by education expenditure requires a specific time lag, potentially spanning multiple fiscal years; second, education is inherently a long-term process, and its effects on improving human capital quality within a region only become evident after several periods. Consequently, an increase in education spending in a given fiscal period does not instantly translate into an improvement in human resources during the same period.

The findings of this research study also indicate that government expenditure on economic functions plays a crucial role in poverty alleviation. Our estimation results show that economic function expenditure has a statistically significant and negative effect on poverty levels. Within the regional government budget, economic function expenditure is primarily utilized to finance public infrastructure and stimulate job creation, both of which are essential for improving economic conditions in local communities. Unlike routine expenditures on goods and services, this type of spending includes capital expenditure, serving as a fundamental public investment to enhance economic productivity. Such investments support various economic sectors, including agriculture, fisheries, trade, and manufacturing, by improving market access, production capacity, and overall

business efficiency. For instance, the development of rural roads not only facilitates the mobility of goods and services but also stimulates agricultural supply chains and commercial activities in remote areas. This, in turn, contributes to poverty alleviation in rural regions, leading to a broader decline in aggregate poverty levels (Tijani et al., 2015). The empirical evidence presented in this study aligns with the findings of Murty & Soumya (2007), who emphasize that public investment through capital expenditure enhances employment opportunities, drives economic growth, and reduces poverty. The underlying mechanism is that improved infrastructure and economic facilities enable higher labor absorption, increased business productivity, and greater income generation—all of which contribute to long-term poverty reduction. These results reinforce the theoretical perspective that well-directed government spending on economic functions can serve as a catalyst for sustainable economic development and inclusive growth. Consequently, policymakers should prioritize economic function expenditures within fiscal frameworks to maximize their impact on poverty alleviation and regional economic resilience.

4. CONCLUSIONS

Poverty remains a significant macroeconomic challenge for regional governments, including that of Jambi Province. Efforts to reduce poverty in this region have consistently involved various development programs funded by public expenditures, specifically allocated to support health, education, and economic functions. This study aimed to estimate and analyze the impact of these three types of public spending on poverty levels in Jambi Province. Using panel data from 11 districts and cities over the period 2016–2023, we employed the dynamic Generalized Method of Moments (GMM) as our econometric approach. The empirical findings reveal that poverty levels in a given year are significantly influenced by poverty levels in the previous year. In other words, poverty experienced by the community in one period contributes positively to an increase in poverty levels in the subsequent period. This causal relationship suggests that poverty tends to perpetuate itself, which may also be linked to birth rates among households classified as poor. Crucially, our analysis indicates that public expenditures on health and economic functions significantly reduce poverty levels. Regions allocating relatively larger public spending to these two functions tend to have lower poverty rates compared to regions with lower allocations; thus, greater expenditure in these areas leads to lower poverty levels. Conversely, while education expenditures exhibit a negative impact on poverty, they do not significantly contribute to poverty reduction in Jambi Province during the studied period.

Based on these findings, we provide the following recommendations (1) reformulate strategic poverty alleviation plans—district and municipal governments in Jambi Province should reformulate strategic plans for poverty alleviation programs. Given the "internal causality" within this macroeconomic variable—where poverty in one year contributes to an increase in the following year—poverty reduction efforts must be comprehensive, including controlling birth rates, particularly among poor households; (2) optimize education expenditure—the allocation of public spending on education should be optimized by considering both its short-term and long-term impacts on improving living standards and reducing poverty; and (3) increase and enhance health and economic expenditures—public spending on health and economic functions should be increased. Concurrently, it's crucial to ensure the efficiency, effectiveness, and accountability of budget implementation by relevant government agencies. This approach aims not only to enhance transparency and accountability in public financial management but also to align financial resource utilization with broader efforts to improve public welfare and reduce poverty levels.

Drawing from the conclusions and recommendations, local governments in Jambi Province should integrate poverty reduction programs with birth control policies, particularly among poor households. Furthermore, the allocation of public spending for the education sector needs to be optimized by focusing on programs that enhance skills and productivity, such as vocational training and entrepreneurship education, and by strengthening the connection between educational institutions and the labor market. Given the proven significance of public spending for the health and economic sectors in reducing poverty rates, budget allocations for these two sectors must be prioritized. Local governments should expand the scope of basic health services and actively

encourage local economic empowerment programs, especially for vulnerable groups. To ensure the effectiveness of these policies, stronger mechanisms for budget control are necessary, including performance-based planning, efficient implementation, and transparent and accountable supervision. This approach aims to ensure that public funds are genuinely aligned with efforts to improve welfare and tangibly reduce poverty at the local level.

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