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Research article

The Impact of Government Expenditure on Poverty in Jambi Province: A Dynamic GMM Approach

Cut Dian Fitri[1] Khairul Amri[2]

Affiliation 1 ;
* Correspondence author: cutdianfitri@ar-raniry.a.id ; Tel.: +62 811-6833-308

A B S T R A C T

This study aims to estimate and analyze the impact of government spending on poverty in Jambi Province. The government spending examined includes expenditures on health, education, and economic functions. Using panel data from 11 districts and cities during the 2016–2023 period, the study employs a dynamic Generalized Method of Moments (GMM) model for analysis. The results demonstrate that expenditures on health and economic functions significantly reduce poverty levels. Conversely, although spending on education has a negative effect, it is not statistically significant. These findings imply that efforts to reduce poverty in Jambi Province can be pursued through policy interventions related to regional budget realization, particularly in the areas of health and economic functions.

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1. INTRODUCTION

Poverty remains a critical global economic challenge, particularly in developing countries (Amri et al., 2024). A substantial proportion of the population in these nations continues to face difficulties in accessing fundamental services such as education and healthcare, as well as securing sustainable employment opportunities. In this context, effective public expenditure is widely regarded as a key policy instrument for addressing these challenges and alleviating poverty (Amri et al., 2023). Targeted government spending on essential sectors—including healthcare, education, and economic services—holds significant potential for improving public welfare. These sectors play a pivotal role in human capital development and economic empowerment, serving as fundamental drivers of sustainable poverty reduction.

In Indonesia, poverty remains widespread across various provinces, including Jambi. Despite consistent economic growth, poverty persists as a major macroeconomic issue in the region. The local government has implemented various fiscal policies, including public expenditure allocations for healthcare, education, and economic services, to mitigate poverty. However, despite recording a robust gross regional domestic product (GRDP) growth rate of 4.7% in 2022 (BPS Jambi, 2023), the province still faced a poverty rate of 7.82% in the same year (Amri & Fitri, 2024; Amri et al., 2024). These statistics underscore the need for a deeper understanding of the effectiveness of public spending in addressing poverty in Jambi Province. Therefore, investigating the relationship between government expenditure in these key sectors and poverty reduction presents a compelling avenue for empirical analysis.

Numerous studies have examined the impact of public spending on poverty alleviation, with several emphasizing the importance of sector-specific expenditure in reducing poverty levels (Gupta et al., 2002; Fan et al., 2004). However, research focusing specifically on the effects of government spending by functional classification—such as healthcare, education, and economic services—at the

provincial level remains relatively scarce, particularly within the Indonesian context. Addressing this research gap is crucial for informing more effective fiscal policies aimed at poverty reduction.

Public expenditure on healthcare has been widely recognized as a critical driver of poverty reduction by enhancing access to medical services, reducing disease burdens, and improving labor productivity. Empirical evidence suggests that increased healthcare funding in Indonesia has contributed significantly to better 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 literacy rate in Jambi Province, which stood at 98.36% in 2022 (BPS Jambi, 2023), highlights 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.

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, given that 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; 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.

The findings of this study are expected to contribute valuable insights for policymakers in optimizing public resource allocation to foster inclusive economic growth and achieve sustainable poverty alleviation. By offering empirical evidence on the effectiveness of government expenditure across key functional sectors, this study seeks to inform policy debates and enhance the formulation of targeted interventions to reduce poverty at the regional level.

2. RESEARCH METHODS

This study utilizes panel data from 11 regencies and cities in Jambi Province over the period 2016–2023. The operational variables in this research consist of the poverty rate (as the dependent variable) and government expenditure (as the independent variable). The poverty rate is proxied by the ratio of the number of poor individuals to the total population (expressed as a percentage). Government expenditure is categorized into three functional areas: health, education, and economic functions.

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 (Government Regulation No. 21 of 2004). 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 (Ministry of Finance Regulation No. 84 of 2019). Meanwhile, economic expenditure refers to the APBD realization allocated for the development of public infrastructure and job creation to enhance local economic activities. These three types of expenditures are measured in thousand rupiahs per capita.

In analyzing the functional relationship between variables by designating the poverty rate as the dependent variable, there is a potential that poverty levels in a given period are highly correlated with their lagged values. Numerous studies have demonstrated that the poverty rate in one period is associated with the poverty level in the previous year (Wang et al., 2021; Alao & Alola, 2022). A dynamic model that incorporates lagged values as predictors for endogenous variables is the Generalized Methods of Moments (GMM) (Romilio & Torrecillas, 2018; Laverde-Rojas & Correa, 2019). Therefore, this study applies the dynamic GMM model as the analytical tool.

However, the application of GMM has limitations related to potential endogeneity issues (Ullah et al., 2018). To address this problem, the instrumental variable 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 instrumental variables. Lagged values satisfy the conditions of relevance and homogeneity, making them valid as instrumental variables (Li et al., 2021). Therefore, the GMM model in this study employs lagged poverty rates as instrumental variables.

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

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. $lnGSGF_{it}$ 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 $lnGSGF_{it}$, $lnGSEF_{it}$, and $lnGSEC_{it}$, respectively. Lastly, μ represents the error term.

The estimated coefficients represent the effect of each type of expenditure on the poverty rate. The significance of a variable's impact on poverty is determined by the statistical significance of its estimated coefficient. For instance, if $\beta_1 \neq 0$ with a p-value < 0.05, it statistically indicates that realized health function expenditures have a significant effect on the poverty rate. Conversely, if $\beta_1 = 0$ with a p-value > 0.05, it implies that the effect of health function expenditures on poverty is not statistically significant.

3. RESULTS AND DISCUSSION

3.1 The result of descriptive statistics

The research findings indicate that poverty levels in Jambi Province vary across districts and cities. On one hand, certain regions exhibit relatively high poverty rates, while on the other, some areas have comparatively low poverty levels. Similarly, the realization of public expenditures on health, education, and economic functions also differs across districts and cities.

The statistical differences in poverty levels and public spending across regions can be observed through descriptive statistics for each variable. Regarding poverty levels, for instance, the data analysis reveals a maximum poverty rate of 12.76%, a minimum rate of 2.76%, and an average poverty rate of 7.76%. These figures suggest that several regions in Jambi Province have poverty rates above the provincial average, including Tanjung Jabung Barat and Tanjung Jabung Timur. Conversely, some areas report below-average poverty rates, such as Sungai Penuh City and Muaro Jambi District.

Furthermore, in terms of public expenditure on health functions, the highest recorded value for this variable is IDR 1,572.03 thousand per capita, while the lowest is IDR 244.89 thousand per capita. On average, the realized spending on health functions amounts to IDR 604.79 thousand per capita. A more detailed overview of the descriptive statistics is presented in Table 1.

Tabel 1. The result of descriptive statistics

Poverty rate	Government spending by public service function (IDR000 per capita)

	(%)	Health functions	Education funtions	Economic functions
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

Source: Author's calculation by E-Views

Table 1 presents the average realization of public spending on education functions, amounting to IDR 1,057.53 thousand per capita, with a maximum and minimum value of IDR 2,473.75 thousand and IDR 220.21 thousand per capita, respectively. These three descriptive statistical parameters further illustrate the disparities in education expenditure across districts and cities. Some regions allocate relatively high expenditures to education functions, while others allocate significantly lower amounts.

Similarly, the realization of local government expenditures on economic functions also varies across districts and cities. The highest recorded expenditure on economic functions reaches IDR 1,855.12 thousand per capita, whereas 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 argument that certain regions in Jambi Province allocate relatively large expenditures to economic functions, while others allocate considerably lower amounts.

3.2 The result of GMM estimation

As previously explained, the dynamic model of GMM was applied to estimate the impact of public expenditures on health, education, and economic functions on poverty levels. The selection of GMM as the most suitable model was based on statistical results indicating that this model is free from autocorrelation issues and statistically satisfies the validity and reliability requirements of the measurement model. Therefore, this model is deemed to have strong validity and to produce accurate estimates.

The dynamic GMM model demonstrates a Hansen *p*-value greater than 0.05, indicating that the model is robust in predicting the relationships among variables. Furthermore, the Wald χ^2 *p*-value, which is less than 0.05, suggests that the estimated results exhibit a high degree of accuracy. Additionally, the *p*-values for AR(1) and AR(2) obtained from the GMM model are <0.05 and >0.05, respectively, implying the presence of first-order correlation but the absence of second-order correlation (Arellano & Bond, 1991). These results meet the necessary conditions to ensure the goodness of fit of the dynamic panel model.

The estimation results indicate a one-way causal relationship in poverty levels with a one-period lag in the time series data, as reflected by the estimated coefficient (α = 0.296, *p*-value < 0.05). This finding underscores the strong persistence of poverty, where past poverty conditions play a significant role in shaping current poverty levels. Specifically, a 1% increase in poverty in the previous period (t-1) leads to a 0.296% rise in poverty in the current period (*t*), highlighting the inertia of poverty over time and its tendency to persist across periods.

These results align with the study by Wang et al. (2021), which analyzed panel data from countries in the Sahara region of Africa and 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, the findings are consistent with the research by Runtunuwua & Tanjung (2020), which similarly confirmed the presence of 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 (t+1), 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 α indicates that while poverty levels do not 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. A more detailed presentation of the GMM estimation results can be found in Table 2.

Table 2. The result of GMM estimation

Constant & predictors	Dependent variable: Pov			
	Estimate coefficient	Std. Error	t-Statistic	p-value
Pov(-1) (α)	0.296**	0.091	3.228	0.009
lnGSHF (β_1)	-0.613**	0.137	-4.487	0.001
lnGSEF (β_2)	-0.190	0.305	-0.623	0.547
lnGSEC (β_3)	-0.084*	0.035	-2.385	0.038
Effects Specification: Cross-section fixed (dummy variables)				
Mean depend. Var	-0.095			
S.E. of regression	0.397			
Hansen test				
J-statistic	10.838			
Prob(J-statistic)	0.146			
Arellano-Bond AR test				
AR(1)	-2.778			
	(0.006)			
AR(2)	-1.295			
	(0.195)			
Wald test				
F-statistic	282.755			
	(0.000)			
Chi-square	1,131.019			
	(0.000)			

Source: Author's calculation by E-Views

Note: The numbers in parentheses indicate *p*-values, while * and ** denote significance at the 90% and 95% confidence levels, respectively.

The empirical findings indicate that regional government spending on health plays a pivotal role in alleviating poverty. The estimation results show that health expenditure has a statistically significant negative effect on poverty levels (β_1 = -0.613, p-value < 0.05), implying that a 1% increase in health spending leads to a 0.613% reduction in poverty rates. This underscores 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 compared to 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. Better healthcare access leads to lower disease burdens, reduced absenteeism in the workforce, and increased labor productivity, which collectively contribute to higher household incomes and 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.

Health expenditure in the regional government budget (APBD) 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.

Unlike the impact of health expenditure on poverty, regional government spending on education does not significantly reduce poverty levels, as indicated by an estimated coefficient of -0.190 (p-value > 0.05). Although education spending has a negative effect, it is not statistically significant, suggesting that an increase in education expenditure does not substantially contribute to reducing the number of impoverished individuals. These findings align with the study by Sayyidina & Iranto (2023), which utilized panel data from 13 provinces in eastern Indonesia and similarly concluded that government spending on education does not have a significant effect on poverty reduction.

The allocation of the regional government budget (APBD) for education expenditure is intended to finance the provision of education under local government responsibility, including teachers' salaries, but excluding funding for official training programs. Increased education spending is expected to enhance educational quality, ultimately contributing to the improvement of living standards. However, the impact of education spending on societal well-being does not occur within the same time frame but requires a certain duration (time lag).

This time lag arises due to two key factors. First, the development of educational facilities and infrastructure funded by education expenditure requires a specific time lag, which may span one fiscal year or even extend beyond multiple budget periods. Second, education is inherently a long-term process, and its effects are not immediately observable. The impact of education on improving human capital quality within a region becomes evident only 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. This explains why, despite its negative effect on poverty, education expenditure does not exhibit statistical significance.

The findings further indicate that government expenditure on economic functions plays a crucial role in poverty alleviation. The estimation results show that economic function expenditure has a statistically significant negative effect on poverty levels, as reflected by an estimated coefficient of

-0.084 (p-value < 0.05). 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 highlights the importance of fiscal policies aimed at fostering economic development through targeted public spending.

Economic function expenditure within the regional government budget (APBD) is strategically allocated to finance the development of 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 category of spending includes capital expenditure, which serves 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 example, the development and maintenance of rural roads not only facilitate the mobility of goods and labor but also stimulate 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), which 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 one of the macroeconomic challenges faced by every regional government, including in Jambi Province. Efforts to reduce poverty levels in this region have been continuously undertaken through various development programs funded by public expenditures, which are allocated to support health, education, and economic functions. This study aims 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, the econometric approach employed in this study is the dynamic model of Generalized Method of Moment.

The empirical findings indicate that poverty levels in a given year are influenced by poverty levels in the previous year. In other words, poverty experienced by the community in a given period contributes positively to the increase in poverty levels in the subsequent period. This causality in poverty levels suggests that poverty tends to perpetuate itself, which is also related to birth rates among households classified as poor.

Public expenditures on health and economic functions are found to significantly reduce poverty levels. Regions that allocate relatively larger public spending to these two functions tend to have lower poverty rates compared to regions with lower allocations. The greater the expenditure on health and economic functions, the lower the poverty levels. Conversely, while education expenditures have a negative impact on poverty, they do not significantly contribute to poverty reduction.

Based on these findings, the study provides the following recommendations: (1) District and municipal governments in Jambi Province should reformulate strategic plans related to the implementation of poverty alleviation programs. Given the "internal causality" in this macroeconomic variable—where poverty in a given year contributes to increased poverty in the following year—poverty reduction efforts should be comprehensive, including controlling birth rates, particularly among poor households; (2) 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) Public spending on health and economic functions should be increased while ensuring 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.

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REVIEW FORM

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Title			√		Maybe you can simplify the title not more than 15 words.
Abstract			√		The abstract consists 100-250 words. Abstract must contain: • Research originality. • Research objectives • Method • Empirical result • Practical implications
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					elucidating the actual aim and objectives of this paper. Authors must add more previous studies in their introduction. The introduction must shows clearly about the research gap, novelty, and research objectives. You can write the research gap, novelty, and research objectives in the last paragraph of introduction, and add a closing sentence that explains the structure of the rest of the article.
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Result & Discussion				√	Results that need to be presented: 1. add unit root test results 2. analysis of results and discussion should be separated The authors should provide a clear analysis of the main statistical results of the study. Authors should also make a separate discussion with a more in-depth analysis behind the research findings and what the implications (consequences) of the findings are, and compare them with empirical findings in previous studies (both those that are in line with and those that are contradictory).

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Conclusion			√		Please make the conclusion simpler (not the same as the sentence in the discussion), answer all the main problems or objectives, and please add policy implications in this research.
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Research article

The Impact of Government Expenditure on Poverty in Jambi Province: A Dynamic GMM Approach

Cut Dian Fitri[1] Khairul Amri[2]

Affiliation 1 ;
* Correspondence author: cutdianfitri@ar-raniry.a.id ; Tel.: +62 811-6833-308

ABSTRACT

Poverty has been a challenge to regional economic development in Indonesia. Therefore, local governments in Indonesia are necessary to carry out work programs focused on poverty reduction. Local fiscal policies, especially in the form of local government spending, are strategic instruments in realizing development programs, which in turn are expected to have an impact on reducing poverty levels. This study aims to estimate and analyze the effect of government spending on poverty in Jambi Province. The government spending examined includes expenditures on health, education, and economic functions. Using panel data from 11 districts and cities during the 2016–2023 period, the study employs a dynamic Generalized Method of Moments (GMM) model for analysis. The results demonstrate that expenditures on health and economic functions significantly reduce poverty levels. Conversely, although spending on education has a negative effect, it is not statistically significant. These findings imply that addressing poverty in Jambi Province may involve implementing policies focused on optimizing regional budget allocations, especially for health and economic programs.

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1. INTRODUCTION

Poverty remains a critical global economic challenge, particularly in developing countries (Amri et al., 2024). A substantial proportion of the population in these nations continues to face difficulties in accessing fundamental services such as education and healthcare, as well as securing sustainable employment opportunities. In this context, effective public expenditure is widely regarded as a key policy instrument for addressing these challenges and alleviating poverty (Amri et al., 2023). Targeted government spending on essential sectors—including healthcare, education, and economic services—holds significant potential for improving public welfare. These sectors play a pivotal role in human capital development and economic empowerment, serving as fundamental drivers of sustainable poverty reduction.

In Indonesia, poverty remains widespread across various provinces, including Jambi. Despite consistent economic growth, poverty persists as a major macroeconomic issue in the region. The local government has implemented various fiscal policies, including public expenditure allocations for healthcare, education, and economic services, to mitigate poverty. However, despite recording a robust gross regional domestic product (GRDP) growth rate of 4.7% in 2022 (BPS Jambi, 2023), the province still faced a poverty rate of 7.82% in the same year (Amri & Fitri, 2024; Amri et al., 2024). These statistics underscore the need for a deeper understanding of the effectiveness of public spending in addressing poverty in Jambi Province. Therefore, investigating the relationship between government expenditure in these key sectors and poverty reduction presents a compelling avenue for empirical analysis.

So far, mumerous studies have examined the impact of public spending on poverty alleviation, with several emphasizing the importance of sector-specific expenditure in reducing poverty levels (Gupta et al., 2002; Fan et al., 2004). Empirical research conducted by Tang et al. (2024) using Philippine economic data found that government spending in cash transfers can significantly reduce poverty. Previously, an empirical study conducted by Siburian (2022) also proved that government spending significantly reduces poverty rates. Likewise, the findings of Wang et al. (2023) in the case of the Chinese economy on the impact of government spending on rural infrastructure development also found that this spending contributed greatly to reducing poverty rates.

Other empirical studies note that not all types of government spending have a positive impact. Shen et al. (2018) revealed that in low-income countries, the effect of government spending on poverty is often weak or inconsistent, especially if spending is focused on unproductive administrative consumption or subsidies. Hidalgo-Hidalgo and Iturbe-Ormaetxe (2018) also highlighted that only productive and sustainable public expenditure such as investment in human capital and infrastructure—has a long-term effect on poverty reduction. Referring to related research as explained above, it can be understood that the influence of government spending on poverty reduction is still an open question and has not provided the same conclusion. Thus, the direction and significance of the relationship between poverty and government spending are important to be reviewed. In addition, government spending that is the focus of these researchers does not focus on government spending based on its function of use. In other words, research focusing specifically on the effects of government spending by functional classification—such as healthcare, education, and economic services—at the provincial level remains relatively scarce, particularly within the Indonesian context. Addressing this research gap is crucial for informing more effective fiscal policies for poverty reduction.

Public expenditure on healthcare has been widely recognized as a critical driver of poverty reduction by enhancing access to medical services, reducing disease burdens, and improving labor productivity. Empirical evidence suggests that increased healthcare funding in Indonesia has contributed significantly to better 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 literacy rate in Jambi Province, which stood at 98.36% in 2022 (BPS Jambi, 2023), highlights 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.

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, given that 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; 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.

The findings of this study are expected to contribute valuable insights for policymakers in optimizing public resource allocation to foster inclusive economic growth and achieve sustainable poverty alleviation. By offering empirical evidence on the effectiveness of government expenditure across key functional sectors, this study seeks to inform policy debates and enhance the formulation of targeted interventions to reduce poverty at the regional level.

2. RESEARCH METHODS

This study utilizes panel data from 11 regencies and cities in Jambi Province over the period 2016–2023. The operational variables in this research consist of the poverty rate (as the dependent

variable) and government expenditure (as the independent variable). The poverty rate is proxied by the ratio of the number of poor individuals to the total population (expressed as a percentage). Government expenditure is categorized into three functional areas: health, education, and economic functions.

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 (Government Regulation No. 21 of 2004). 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 (Ministry of Finance Regulation No. 84 of 2019). Meanwhile, economic expenditure refers to the APBD realization allocated for the development of public infrastructure and job creation to enhance local economic activities. These three types of expenditures are measured in thousand rupiahs per capita.

In analyzing the functional relationship between variables by designating the poverty rate as the dependent variable, there is a potential that poverty rate in a given period are highly correlated with their lagged values. Numerous studies have demonstrated that the poverty rate in one period is associated with the poverty rate in the previous year (Wang et al., 2021; Alao & Alola, 2022). A dynamic model that incorporates lagged values as predictors for endogenous variables is the Generalized Methods of Moments (GMM) (Romilio & Torrecillas, 2018; Laverde-Rojas & Correa, 2019). Therefore, this study applies the dynamic GMM model as the analytical tool.

However, the application of GMM has limitations related to potential endogeneity issues (Ullah et al., 2018). To address this problem, the instrumental variable 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 instrumental variables. Lagged values satisfy the conditions of relevance and homogeneity, making them valid as instrumental variables (Li et al., 2021). Therefore, the GMM model in this study employs lagged poverty rates as instrumental variables, which are econometrically formulated as follows:

$$\mathrm{Pov}_{it} = \propto \mathrm{Pov}_{i(t-1)} + \beta_1 \ln\mathrm{GSHF}_{it} + \beta_2 \ln\mathrm{GSEF}_{it} + \beta_3 \ln\mathrm{GSEC}_{it} + \mu$$

The symbols in the equation are defined as follows: Pov_{it} represents the poverty rate in district/city *i* during period *t*, while $\mathrm{Pov}_{i(t-1)}$ denotes the lagged value of Pov_{it}, referring to the poverty rate in the same district/city in the previous period. $\ln\mathrm{GSGF}_{it}$ represents the logarithmic value of realized health function expenditures in district/city i during period t, $\ln\mathrm{GSEF}_{it}$ indicates the logarithmic value of realized education function expenditures in district/city *i* during period *t*, and $\ln\mathrm{GSEC}_{it}$ denotes the logarithmic value of realized economic function expenditures in district/city *i* during period *t*. Furthermore, α is the estimated coefficient of $\ln\mathrm{Pov}_{it}$, while β_1, β_2, and β_3 are the estimated coefficients of $\ln\mathrm{GSGF}_{it}$, $\ln\mathrm{GSEF}_{it}$, and $\ln\mathrm{GSEC}_{it}$, respectively. Lastly, μ represents the error term.

The estimated coefficients represent the effect of each type of expenditure on the poverty rate. The significance of a variable's impact on poverty is determined by the statistical significance of its estimated coefficient. For instance, if $\beta_1 \neq 0$ with a p-value < 0.05, it statistically indicates that realized health function expenditures have a significant effect on the poverty rate. Conversely, if $\beta_1 = 0$ with a p-value > 0.05, it implies that the effect of health function expenditures on poverty is not statistically significant.

3. RESULTS AND DISCUSSION

3.1 The result of descriptive statistics

The research findings indicate that poverty levels in Jambi Province vary across districts and cities. On one hand, certain regions exhibit relatively high poverty rates, while on the other, some areas

have comparatively low poverty levels. Similarly, the realization of public expenditures on health, education, and economic functions also differs across districts and cities.

The statistical differences in poverty levels and public spending across regions can be observed through descriptive statistics for each variable. Regarding poverty levels, for instance, the data analysis reveals a maximum poverty rate of 12.76%, a minimum rate of 2.76%, and an average poverty rate of 7.76%. These figures suggest that several regions in Jambi Province have poverty rates above the provincial average, including Tanjung Jabung Barat and Tanjung Jabung Timur. Conversely, some areas report below-average poverty rates, such as Sungai Penuh City and Muaro Jambi District.

Furthermore, in terms of public expenditure on health functions, the highest recorded value for this variable is IDR 1,572.03 thousand per capita, while the lowest is IDR 244.89 thousand per capita. On average, the realized spending on health functions amounts to IDR 604.79 thousand per capita. A more detailed overview of the descriptive statistics is presented in Table 1.

Tabel 1. The result of descriptive statistics

	Poverty rate	Government spending by public service function (IDR000 per capita)		
	(%)	Health functions	Education funtions	Economic functions
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

Source: Author's calculation by E-Views

Table 1 presents the average realization of public spending on education functions, amounting to IDR 1,057.53 thousand per capita, with a maximum and minimum value of IDR 2,473.75 thousand and IDR 220.21 thousand per capita, respectively. These three descriptive statistical parameters further illustrate the disparities in education expenditure across districts and cities. Some regions allocate relatively high expenditures to education functions, while others allocate significantly lower amounts.

Similarly, the realization of local government expenditures on economic functions also varies across districts and cities. The highest recorded expenditure on economic functions reaches IDR 1,855.12 thousand per capita, whereas 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 argument that certain regions in Jambi Province allocate relatively large expenditures to economic functions, while others allocate considerably lower amounts.

3.2 The result of unit root test

Before estimating a dynamic model, an important first step is to test the stationarity of each variable used in the analysis. This test aims to avoid spurious regression resulting in biased and invalid estimates. Therefore, in this study, a panel unit root test was carried out on the main variables, namely the poverty rate (Pov), the logarithm of government spending on health function (lnGSHF), education function (lnGSEF), and economic function (lnGSE C). Testing was carried out using four general methods widely used in the literature. The four methods consist of Levin, Lin, and Chu (LLC), Im, Pesaran, and Shin (IPS), ADF-Fisher, and PP-Fisher. The respective methods have a different approach and assumptions to detect the presence of unit roots. Therefore, they are simultaneously utilized to obtain more comprehensive conclusions regarding the integration characteristics of the panel data being analyzed. The test results are displayed in Table 2.

Table 2. The result of unit root test

Variables	Test for a unit root in	Methods			
		LLC	IPS	ADF-Fisher	PP-Fisher
Poverty	Level	[-3.359]*** (0.000)	[-0.531] (0.297)	[23.048] (0.286)	[38.388]*** (0.008)
	1st dif	[-4.387]*** (0.000)	[-0.346] (0.364)	[20.537] (0.425)	[56.346]*** (0.000)
lnGSHF	Level	[-5.298]*** (0.000)	[0.028] (0.511)	[22.113] (0.453)	[38.296]** (0.017)
	1st dif	[-8.012]*** (0.000)	[-0.816] (0.207)	[27.644] (0.188)	[75.229]*** (0.000)
lnGSEF	Level	[-2.539]*** (0.006)	[0.318] (0.625)	[24.664] (0.313)	[76.004]*** (0.000)
	1st dif	[-0.547] (0.292)	[-1.253] (0.105)	[32.252]* (0.073)	[136.996]*** (0.000)
lnGSEC	Level	[2.742] (0.997)	[0.460] (0.677)	[24.476] (0.323)	[14.999] (0.862)
	1st dif	[-1.377]* (0.084)	[-0.872] (0.191)	[29.472] (0.132)	[65.030]*** (0.000)

Source: Author's calculation by E-Views

Note: The numbers in [ ] are t statistics, and in ( ) are p-values. The sign * ** *** indicates significance at the 95%, 97.5%, and 99% confidence levels.

The table above shows that most of the variables tested are non-stationary at level, but become stationary after the first differentiation. For the poverty rate (Pov), 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 variable logarithm of government spending on health function (lnGSHF) 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 variable logarithm of government expenditure education function (lnGSEF), 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 government spending variable for economic functions (lnGSEC) 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 Generalized Method of Moments (GMM) approach in estimating the model.

3.4 The result of GMM estimation

As previously explained, the dynamic model of GMM was applied to estimate the impact of public expenditures on health, education, and economic functions on poverty levels. The selection of GMM as the most suitable model was based on statistical results indicating that this model is free from autocorrelation issues and statistically satisfies the validity and reliability requirements of the measurement model. Therefore, this model is deemed to have strong validity and to produce accurate estimates.

The dynamic GMM model demonstrates a Hansen *p*-value greater than 0.05, indicating that the model is robust in predicting the relationships among variables. Furthermore, the Wald χ^2 *p*-value, which is less than 0.05, suggests that the estimated results exhibit a high degree of accuracy.

Additionally, the *p*-values for AR(1) and AR(2) obtained from the GMM model are <0.05 and >0.05, respectively, implying the presence of first-order correlation but the absence of second-order correlation (Arellano & Bond, 1991). These results meet the necessary conditions to ensure the goodness of fit of the dynamic panel model.

The estimation results indicate a one-way causal relationship in poverty levels with a one-period lag in the time series data, as reflected by the estimated coefficient (α = 0.296, *p*-value < 0.05). This finding underscores the strong persistence of poverty, where past poverty conditions play a significant role in shaping current poverty levels. Specifically, a 1% increase in poverty in the previous period (t-1) leads to a 0.296% rise in poverty in the current period (*t*), highlighting the inertia of poverty over time and its tendency to persist across periods.

The empirical findings indicate that regional government spending on health plays a pivotal role in alleviating poverty. The estimation results show that health expenditure has a statistically significant negative effect on poverty levels (β_1 = -0.613, p-value < 0.05), implying that a 1% increase in health spending leads to a 0.613% reduction in poverty rates. This underscores 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 compared to those with lower spending, suggesting that well-targeted health investments can serve as an effective poverty alleviation strategy. A more detailed presentation of the GMM estimation results can be found in Table 2.

Table 2. The result of GMM estimation

Constant & predictors	Dependent variable: Pov			
	Estimate coefficient	Std. Error	t-Statistic	p-value
Pov(-1) (α)	0.296**	0.091	3.228	0.009
lnGSHF (β_1)	-0.613**	0.137	-4.487	0.001
lnGSEF (β_2)	-0.190	0.305	-0.623	0.547
lnGSEC (β_3)	-0.084*	0.035	-2.385	0.038
Effects Specification: Cross-section fixed (dummy variables)				
Mean depend. Var	-0.095			
S.E. of regression	0.397			
Hansen test				
J-statistic	10.838			
Prob(J-statistic)	0.146			
Arellano-Bond AR test				
AR(1)	-2.778			
	(0.006)			
AR(2)	-1.295			
	(0.195)			
Wald test				
F-statistic	282.755			
	(0.000)			
Chi-square	1,131.019			
	(0.000)			

Source: Author's calculation by E-Views

Note: The numbers in parentheses indicate *p*-values, while * and ** denote significance at the 90% and 95% confidence levels, respectively.

Unlike the impact of health expenditure on poverty, regional government spending on education does not significantly reduce poverty levels, as indicated by an estimated coefficient of -0.190 (*p*-value > 0.05). Although education spending has a negative effect, it is not statistically significant,

suggesting that an increase in education expenditure does not substantially contribute to reducing the number of impoverished individuals.

The findings further indicate that government expenditure on economic functions plays a crucial role in poverty alleviation. The estimation results show that economic function expenditure has a statistically significant negative effect on poverty levels, as reflected by an estimated coefficient of -0.084 (p-value < 0.05). 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 highlights the importance of fiscal policies aimed at fostering economic development through targeted public spending.

3.4 Discussion

The results of this study indicate a causal relationship between the poverty rate in a given period and the poverty rate in the previous period. This finding statistically suggests that past poverty rate plays an important role in shaping the current poverty rate. The existence of a positive and significant influence of the cross-time poverty rate is evidence that the poverty rate creates itself. In the context of district/city areas in Jambi province, this finding indicates that a region with relatively high poverty rates in a given period will have relatively high poverty rates in the next.

These results align with the study by Wang et al. (2021), which analyzed panel data from countries in the Sahara region of Africa and 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, the findings are consistent with the research by Runtunuwua & Tanjung (2020), which similarly confirmed the presence of 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 (t+1), 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 (α=0.296) indicates that while poverty levels do not 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 3 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. Better healthcare access leads to lower disease burdens, reduced absenteeism in the workforce, and increased labor productivity, which collectively contribute to higher household incomes and 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.

Health expenditure in the regional government budget (APBD) 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.

Unlike the impact of health expenditure on poverty, regional government spending on education does not significantly reduce poverty levels. Although education spending has a negative effect, it is not statistically significant, suggesting that an increase in education expenditure does not substantially contribute to reducing the number of impoverished individuals. This finding aligns with the findings of Sayyidina & Iranto (2023), who utilized panel data from 13 provinces in eastern Indonesia and pointed out that government spending on education has an insignificant effect on poverty reduction.

The allocation of the regional government budget for education spending tends to finance the provision of education under local government responsibility, including teachers' salaries, but excluding funding for live skill-training programs. Increased education spending is expected to enhance education quality and ultimately contribute to raising living standards. However, the impact of education spending on societal well-being does not occur within the same time frame but requires a time lag.

This time lag arises due to two key factors. First, educational facilities and infrastructure funded by education expenditure require a specific time lag, which may span one fiscal year or even extend beyond multiple budget periods. Second, education is inherently a long-term process, and its effects are not immediately observable. The impact of education on improving human capital quality within a region becomes evident only 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. The estimation results show that economic function expenditure has a statistically significant and negative effect on poverty levels. Economic function expenditure within the regional government budget is utilized to finance public infrastructure and stimulate job creation. Public infrastructure and job creation are essential for improving economic conditions in local communities. Unlike routine expenditures on goods and services, this type of spending includes capital expenditure, which serves 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 respective, 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), which 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 one of the macroeconomic challenges faced by every regional government, including in Jambi Province. Efforts to reduce poverty levels in this region have been continuously undertaken through various development programs funded by public expenditures, which are allocated to support health, education, and economic functions. This study aims 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, the econometric approach employed in this study is the dynamic model of Generalized Method of Moment.

The empirical findings indicate that poverty levels in a given year are influenced by poverty levels in the previous year. In other words, poverty experienced by the community in a given period contributes positively to the increase in poverty levels in the subsequent period. This causality in poverty levels suggests that poverty tends to perpetuate itself, which is also related to birth rates among households classified as poor. Public expenditures on health and economic functions are found to significantly reduce poverty levels. Regions that allocate relatively larger public spending to these two functions tend to have lower poverty rates compared to regions with lower allocations. The greater the expenditure on health and economic functions, the lower the poverty levels. Conversely, while education expenditures have a negative impact on poverty, they do not significantly contribute to poverty reduction.

Based on these findings, the study provides the following recommendations: (1) District and municipal governments in Jambi Province should reformulate strategic plans related to the implementation of poverty alleviation programs. Given the "internal causality" in this macroeconomic variable—where poverty in a given year contributes to increased poverty in the following year—poverty reduction efforts should be comprehensive, including controlling birth rates, particularly among poor households; (2) 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) Public spending on health and economic functions should be increased while ensuring 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.

Referring to the conclusions and suggestions above, local governments need to integrate poverty reduction programs with birth control policies, especially among poor households. On the other hand, the allocation of public spending for the education sector needs to be optimized by focusing on programs that improve skills and productivity, such as vocational training and entrepreneurship education, and strengthening connections between the world of education and the labor market. In addition, because public spending for the health and economic sectors has proven significant in reducing poverty rates, budget allocations for these two sectors need to be

prioritized. Local governments should expand the scope of basic health services and encourage local economic empowerment programs, especially for vulnerable groups. To support the effectiveness of these policies, stronger mechanisms for budget control are necessary through performance-based planning, efficient implementation, and transparent and accountable supervision. This approach aims to ensure that the use of the public budget is truly in line with efforts to improve welfare and reduce poverty in real terms at the local level.

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Notifications

[JEP] Editor Decision

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ACCEPTANCE LETTER

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Research article

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

Cut Dian Fitri*, **Khairul Amri**

Department of Economics, Faculty of Islamic Economics and Business, UIN Ar-Raniry Banda Aceh
* Corresponding author email: cutdianfitri@ar-raniry.a.id

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.

Tabel 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 Result of GMM Estimation

Dependent variable: $\mathrm{Pov_{it}}$			
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	Chi^2	
	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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