Efficient Vol 8 (2) (2025): 171-182 DOI: https://doi.org/10.15294/9qb5q806

EFFICIENT

Indonesian Journal of Development Economics
https://journal.unnes.ac.id/sju/index.php/efficient

The Effectiveness of Economic Growth on Regional Expenditure in Central Java Province

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Permalink/DOI: https://doi.org/10.15294/9qb5q806

Submitted: December 2024; Revised: March 2025; Accepted: June 2025

Abstract

Regional spending plays a strategic role in supporting economic development. This study analyzes the factors influencing regional spending in regencies and cities in Central Java Province using panel regression with five variables: effectiveness ratio, population, government assistance, HDI, and economic growth. Data from 2015-2022 were sourced from BPS and The Ministry of Finance. Spatial data were visualized using GIS-based mapping to illustrate fiscal self-sufficiency across regions. The results show that population size, HDI, and government assistance significantly affect regional spending. While the effectiveness ratio and economic growth are not significant. Spatial reveal that cities such as Semarang, Magelang, and Surakarta demonstrate higher fiscal independence, while regencies like Brebes remain highly dependent on central transfers. These findings suggest that improving human development and increasing local revenue capacity, especially in less developed regencies, are key strategies to enhance fiscal independence and promote regional economic resilience.

Keywords: *Economic Growth, Effectiveness Ratio, Panel Regression, Regional Spending*

How to Cite: The Effectiveness of Economic Growth on Regional Expenditure in Central Java Province. (2025). Efficient: Indonesian Journal of Development Economics, 8(2), 171-182. https://doi.org/10.15294/9qb5q806

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INTRODUCTION

Regional spending serves as a key instrument of fiscal policy that contributes significantly to economic management at the local level. An effective allocation of the regional budget allows local governments to implement a wide range of development programs aimed at improving public welfare. Regional expenditures encompass various budgetary components, including personnel costs, procurement of goods, and service-related expenses. These expenditures not only support operational needs but also play a strategic role in enhancing the quality of public service delivery (Sasana, 2019).

In practice, however local goverments often face challeges in designing a planning and budgeting framework that is both accountable and efficient. Inefficient use of budgetary resources can lead to negative consequences such as income inequality, reduces productivity, and limited transparency in the management of regional finances.

Consequently, transparency in regional spending serves as a vital indicator to assess wether the allocated budget is effectively supporting development objectives and improving welfare.

Some studies that analyze regional original income (PAD) in financing government spending are the highest. A higher level of locally generated income generally enhances a government's fiscal capacity to fund development projects and deliver public services. However, regions with substantial infrastructure needs often exhibit higher spending levels, regardless of limited revenue capacity.

Moreover, a heavy reliance on central government transfer funds, such as General Allocation Fund (DAU) and Special Allocation Fund (DAK), can constrain the flexibility of local governments in determining spending priorities (Fatimah, 2020).

Therefore, even though there is a significant relationship between spending and regional income, there are other external factors that play an important role in determining regional spending patterns. Table 1 Shows the realization of regional spending in Central Java, which has the highest level of expenditure compared to other provinces.

Table 1. Expenditure Realization by Province in Java

Province	**Government Expenditure Realization by Province (in millions of IDR)**		
	2021	**2022**	**2023**
West Java	11.632.981	11.822.574	11.649.958
Central Java	16.348.164	15.167.837	16.351.282
DI Yogyakarta	1.073.078	1.171.852	1.373.656
East Java	14.596.149	14.395.510	15.429.664

Source: Statistics Indonesia, 2021 - 2023

Table 1 shows the realization of expenditure in several provinces in Java. The data shows an increase in the last three years. The province of Central Java has seen a significant increase from 2021 to 2023 with the largest regional expenditure. According to regional economic and financial literature, the relationship between regional income and expenditure indicates a positive relationship between the central government and regional expenditure.

All regional revenues and expenditures in carrying out regional autonomy are recorded and managed in the regional budget (APBD) (D.

Kartika, 2017)(Anggraini Putri, 2016)(Frits O Fanggidae, 2019). One of the important components in the regional budget is the allocation of the expenditure budget for the community, such as education, health, and social programs (Hidayat, Permatasari and Aeni, 2024). The size of the regional budget depends on the size of the population. The budget also includes the provision of public facilities and programs issued by the government.

The effectiveness of this program depends on how well the government allocates and distributes the budget according to the needs of the citizens. Based on research from Devita, Delis and Junaidi (2014), there is a significant negative relationship between population-based and regional spending. Therefore, the relationship between the population and the assistance received is crucial in determining the effectiveness of policies in improving the welfare of the community.

The effectiveness of regional expenditure in Central Java, especially in the context of the autonomy of regions that have the authority to manage the budget, there are still various problems that hinder the optimization of regional expenditure in this province. One of the main challenges is the ineffectiveness of budget allocation, where several districts/cities in Central Java allocate a larger budget (APBD) to employee needs than more productive capital expenditure. It can hamper infrastructure and public services that should contribute to increasing economic growth.

Research from Anynda (2024) states that the effectiveness ratio has an influence on regional financial performance. The dependence of local governments on the central government is also a focus of this study. Research from Marlianita and Saleh (2020) explains that is no significant influence between dependency ratio and regional spending. The implementation of fiscal decentralization is certainly supported by vital instruments that reflect how local governments manage financial resources to support development and public services.

The amendment to Law Number 22 of 1999 regulating regional autonomy has led the Indonesian government to change its policy from centralistic to regional autonomy. The provision of this policy aims to manage regional development with cre Public welfare, as reflectedativity, innovation and independence to enable each region to reduce its dependence on the central government.

Today, regions have the authority to seek alternatives while still accepting and distributing aid and using funds in accordance with regional development priorities. The implementation of regional autonomy in Indonesia is the transfer of authority from the central government to local governments in the monetary and fiscal fields, which are decentralized to the regions (Christia and Ispriyarso, 2019).

Local governments are given the responsibility of organizing public services that are expected to help improve the welfare of the community. Public welfare, as reflected by the Human Development Index (HDI) is composite index measuring average achievement in key dimensions of human development such as healthy, education, and infrstructure can directly influence HDI. Based on research from Priambodo (2019) there is a significant positive relationship between HDI and regional spending.

Research from Hammond and Thompson (2008) explains the relationship between fiscal decentralization and economic growth with panel data in 46 developed and developing countries. The results show that there is a negative relationship between the two variables.

The economy in developed countries is higher than in decentralized developing countries. It can also be seen in several regencies and cities in Central Java province, such as Semarang, Surakarta, and Salatiga, compared to Blora, Cilacap, and Demak, which have different economic growth rates. It is because in urban areas, they apply more inclusive downstream sector economics, while other areas, such as Blora and Demak, apply more primary sector economics.

Regional spending in Central Java faces challenges in meeting the needs of the community, one of which is dependence on central transfer funds, where many regions still rely on the General Allocation Fund (DAU) and Special Allocation Fund (DAK) from the central government. This dependence limits regional fiscal autonomy because the Regional Original Revenue (PAD) has not been able to fully support expenditure needs. As a result, regions have limited fiscal space in determining development priorities that correspond to local conditions.

Ineffective spending allocations are also a dilemma in regional policy. In many cases, the proportion of regional spending is more dominant than capital expenditure, which has a direct impact on economic growth. This challenge has reduced the efficiency of regional expenditure in regencies and cities in Central Java Province.

This study attempted to fill the gap in previous studies by focusing specifically on the effectiveness of regional spending in Central Java. Most previous studies have highlighted the relationship between regional spending and economic growth only in aggregate at the national level, but few have analyzed it at the provincial level. The impact on the population, the effectiveness of regional revenue, and the assistance provided by the government were variables in this study. This study employs panel data regression using data from 35 regencies/cities in Central Java for the period 2015-2023, sourced from Central Statistics Agency and Ministry of Finance.

Despite the growing literature on regional spending, few studies have thoroughly examined how various internal and external factors simultaneously influence regional expenditure, particularly at the provincial level. Most research tends to focus on national aggregates or general fiscal performance without distinguishing between types of regions. This study seeks to address that gap by analyzing the effectiveness of regional expenditure in Central Java Province using panel data regression.

It incorporates variable such as GRDP, population, the effectiveness, HDI, with regional expenditure as the dependent variable. In addition to panel data regression analysis, this study employs spatial analysis using GIS to visually map and analyze the distribution of fiscal decentralization level across the regions in Central Java Province.

GIS allows for a detail spatial perspective, enabling the identification of clusters or patterns of high and low fiscal decentralization that might influence regional expenditure effectiveness. The integration of spatial analysis adds a novel dimension to understanding the geographic variation of fiscal management, which has been underexplored in previous studies. This approach is expected to provide more contextual insights into the allocation patterns and fiscal behavior of local goverments in supporting development outcomes.

RESEARCH METHODS

This study uses a quantitative approach with a regression panel model to examine the effects of Gross Regional Domestic Product (GRDP), population, effectiveness ratio, financial support, and Human Development Index (HDI) on regional spending in Central Java Province for the Period 2015 -2023. The data used in this study comes from *BPS and The Ministry of Finance,* and related regional agencies.

Furthermore, the study incorporates ArcGIS spatial analysis to map and analyze the degree of fiscal decentralization across the regions. The degree of fiscal decentralization is measure by calculating the ratio of Regional Original Revenue (PAD) to total regional reveneue, which reflects the fiscal autonomy level of each region. This spatial dimension enriches the analysis by identifying areas with varying levels of decentralization, providing insights into how fiscal autonomy correlates with expenditure pattern. GIS (Geographic Information System) spatial analysis was conducted using Microsoft Excel for data processing and visualization. Spatial mapping helped regional variations fiscal decentralization levels. The operational definition of the variables is stated in Table 2.

Table 2. Operational Definition of Variable

No	Variable	Operational Definition	Unit
1.	Gross Regional Domestic Bruto	The amount of added value generated by all production units in a region within a certain period of time	*grdp*
2.	Population	The total number of individuals living in a region at a certain time	*Population*
3.	Effectiveness ratio	The level of success of the government's revenue program as measured by comparing the output achieved with the target planned	Effect ratio
4.	Support	Financial support provided by the government or institutions to certain regions	Support
5.	Human development index	Indicators used to measure the quality of human development from three dimensions: education, health, and decent living standards	hdi
6.	Regional spending	Expenditures made by local governments in the context of implementing government functions, public services, and economic development	*Local Shopping*

Source: Processed data, 2025

The hypothesis in this study was used to test whether there is an effect of the independent variable on the dependent variable with panel regression analysis as follows: H1 is gross regional domestic product significantly affects regional spending in Central Java Province, H2 is the population significantly affects regional spending in Central Java province, H3 is effectiveness significantly affects regional spending in Central Java Province and H4 is financial support has a significant effect on regional spending in Central Java Province.

The model used in this study was static panel regression analysis. Panel data was a combination of time series data and cross-sectional data. The general panel regression model was expressed as follows:

$$Y_{it} = \propto + \beta_1 x_{it} + \beta_2 X_{2it} + \cdots + \beta_n x_{nt} + \varepsilon_{it}$$

Where Y_{it} indicates the bound variable, while X_{it} indicates the free variable, i indicates the i-th individual, t indicates the t-th period and ε_{it} indicates the cross-sectional error at i and time at t. The estimation of the model in panel data regression can be done with several approaches, namely the common effect model, fixed effect model and random effect model. The following model is obtained:

$$Y_{it} = \propto + \beta_1 pdrb_{it} + \beta_2 population_{it} + \beta_3 effectiveness_{it} + \beta_4 support_{it} + \varepsilon_{it}$$

Where Y_{it} represents regional in spending in region i at time t; α is the intercept term;and $\beta_1, \beta_2, \beta_3, \beta_4$ are the coefficients for the explanatory variables. Specifically, $PDRB_{it}$ denotes the gross regional domestic product, $Population_{it}$ refers to the number of inhabitants, $Effectiveness_{it}$ captures the effectiveness ratio of budget implementation, and $Support_{it}$ represents the amount of intergovernmental fiscal support received.

The error term ε_{it} accounts for unobserved factors affecting regional spending that vary across both time and entities. This model structure allows for the estimation of how each of these factors influence regional government expenditure over time and across different regencies or cities. The effectiveness ratio in this study is the ability of the local government to manage local finances with a good proportion, resulting in a realization value that is greater than the budgeted target. The formula for calculating capital expenditure is shown below (Anynda, 2024):

$$effectiveness\ ratio = \frac{realization\ of\ PAD}{target\ revenue\ PAD} \times 100$$

To ensure the robustness and validity of the panel regression model, several statistical and diagnostic procedures were carried out. These test are essential to confirm that the model meets the underlying assumptions of panel data analysis and provides reliable and unbiased estimates. The heteroskedasticity test was conducted to examine whether the variance of residual is constant across observations.

The presence of heteroskedasticity can lead in inefficient estimators and biased standard errors. Additionally, an autocorrelation test such as the Wooldridge test for panel data was used to detect ether residuals are serially correlated, which would violate the assumption of independence and potentially disort the accuracy of the coefficient estimates.

A normality test of residuals was also performed to assess wether the residuals follow a normal distribution. While normality is not strict requirement for the ordinary least square (OLS) estimator, it is important for valid inference in small samples. Furthermore, panel data specific diagnostics were applied.

The Hausman test was used to determine the suitability of the fixed effects model versus the random effect model: a significant result indicates that fixed effects model is more appropriate due to correlation between the regressors and unobserved individual effects. The Breusch- Pagan Lagrange Multiplier (LM) test was conducted to evaluate whether the random effects model is preferable to the pooled OLS model.

Finally, model significance was assessed using the F- test to evaluate the joint significance of all explanatory variables, and the t-test to assess the individual significance of each coefficient. These diagnostic steps collectively strengthen the validity and credibility of the panel regression results.

In addition to the regression model, a spatial descriptive analysis was conducted to map and interepret the degree of fiscal decentralization across district/cities. The variable was not included in regression model, but was calculated using the following formula proposed by Priambodo (2019):

$$Dfit = \frac{PADit}{TPDit} \times 100$$

The degree of fiscal decentralization ($Dfit$) was calculated using ratio of Regional Original Revenue ($PADit$) to Total Regional Revenue ($TPDit$), following the formula proposed by Priambodo (2019). In this formula $PADit$ refers to the Regional Original Revenue of region i in year, while $TPDit$ denotes the Total Regional Revenue of region i in year t.

This indicator reflects the level of fiscal autonomy for each region. Spatial visualization was conducted using Microsoft Excel to map the variation of fiscal decentralization across Central Java. This descriptive spatial analysis complements the panel regression by providing geographic insights into regional patterns of fiscal independence and expenditure behaviour.

RESULTS AND DISCUSSION

This subchapter discusses the influence of several factors on regional spending in Central Java Province. The independent variables analyzed include population, effectiveness ratio, government support, and economic growth. These factors are expected to significantly contribute to variations in the level of regional spending across the province.

To determine the most appropriate panel data model, several statistical test are employed, including the Chow test (to choose between pooled OLS and fixed effects), the Hausman test (to decide between fixed effects and random effects), and the Lagrange Multiplier (LM) (to determine between random effects is preferred over pooled OLS).

Table 3. Model Testing Results for Panel Regression Selection

Chow Test	0,1091< 0,05	Cem
LM Test	0,3895> 0,05	Cem

Source: Processed data, 2025

Based on the results of the Chow Test and LM Test, the p-values obtained were 0,1091 and 0,3895. Respectively both which are greater that the 5% signifance level. This indicates that there is no significant difference between the CEM and FEM or REM models, so the most appropriate model to uses is the CEM.

The results of the panel regression using regional spending as the dependent variable provide deep insights into how the economic sector affects regional spending. Overall, this model has an R-Square of 0.6495, which indicates that around 64.95% of the variation in regional spending can be explained by the independent variables used. In other words, almost all variations in regional spending can be predicted through this sector.

The F-Statistic value of 100.52 with a probability of 0.0000 shows that this model is statistically significant as a whole, or it can be said that all variables in this model have a positive effect on regional spending in Central Java Province.

Table 4. Results of Panel Data Regression Analysis

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
c	-2,531517	0,7847114	-3,23	0,001***
pdrb	0,0003322	0,0004582	0,73	0,469
population	0,5981524	0,0390616	15,31	0,000***
Effect ratio	-0,0000171	0,000263	-0,06	0,948
support	0,0000381	2,5406	5,04	0,000***
ipm	-2,5315217	0,7874114	-3,23	0,001***
R-Squared		0,6495		
Adjusted R-Squared		0,6430		
F-statistic		100,52		
Prob(F-Statistic)		0,0000		

Note: *Significant at 10%. **Significant at 5%, ***Significant at 1%

Source: Processed data, 2024

In detail, this sector shows a significant influence, both positive and negative, on regional spending. Economic growth has a positive coefficient, which means that every increase in economic growth tends to be followed by an increase in regional spending. However, this influence is not statistically significant (p-value = 0.469), this finding is consistent with the study (Adyatama and Oktaviani, 2015) which shows that economic growth does not directly determine the amount of local government spending in district or cities.

The study explain that even if GRDP increase, it does not automatically lead to higher government spending because the budgeting process in local goverments is mostly influenced by other factors (Syukri and Hinaya, 2019). requiring a more in-depth analysis of the factors that cause regional spending to be beneficial. These results still indicate that high economic growth can increase regional spending because economic conditions are determined by local government policies and spending used for the needs of the people.

However, economic growth is not the main variable in increasing regional spending. Research from (Fitriyanti and Handayani, 2020) shows that regional spending is mostly used for employee expenses and the procurement of goods and services. Therefore, it is hoped that in the future it can be used to improve public services.

On the other hand, the population variable shows a significant positive effect with a coefficient of 0.598124, indicating that 59.81% of the variation in regional spending can be explained by the independent variable. Statistically, the variable has a significant effect. It reinforces the understanding that the larger the population of a region, the more regional spending. It shows that the government of Central Java Province is able to meet the spending needs of the region, and that population growth does not reduce direct spending.

This result is consistent with previous research from (Handayani *et al.*, 2022) (Marseno and Mulyani, 2020). The significance of this variable is still seen from demographic conditions based on productive age. Thus, regions with a high ratio of productive-age population may have greater purchasing power and economic contribution, resulting in increased regional income.

The effectiveness ratio variable in regional finance is a measure used to determine the extent to which the government can realize its planned revenue. The results show that the coefficient of this variable is negative at -0.0000171. Statistically, this variable has no significant effect on regional spending in Central Java Province with a probability (p-value = 0.948). It indicates that the achievement of revenue targets does not necessarily affect the allocation or realization of regional spending (Nuraini, Ida; Hakim, 2021).

The support variable is in the form of fiscal support provided by the central government to local governments to support certain sectors. The government provides support in the form of grants to support the economic growth of the region. The results of the data analysis show that the coefficient is significantly positive for regional spending with a value (p-value = 0.000).

This analysis shows that the greater the assistance received by the local government, the more regional spending tends to increase. It can be explained by the fiscal transfer mechanism where support in the form of balancing funds, grants, or subsidies from the central government can increase fiscal capacity in Central Java Province. The human development index (HDI) has a coefficient value of -2.5315217 which indicates that the human development index is actually related to a decrease in regional spending. This variable has a significant statistical effect with a p-value of 0.001. The interpretation of these results leads to the finding that the province of Central Java, which has a tendency for a high HDI, tends to have good socio-economic infrastructure, requiring a lot of regional spending.

Therefore, the allocation of regional expenditure can be used as well as possible for education and health to improve the HDI (Hidayat and Woyanti, 2021). The effectiveness ratio variable in regional finance is a measure used to determine the extent to which the government can realize its planned revenue. The results show that the coefficient of this variable is negative at -0,0000171.

Statistically, this variable has no significant effect on regional spending in Central Java Province with a probability (p-value = 0,948). It indicates that the achievement of revenue targets does not necessarily affect the allocation or realizatiton of regional spending. This may indicate that although the region has achieved is revenue targets, these revenues are not necessarily sufficient to meet expenditure needs, possibly due to allocation or reliance on central government tranfer bunds.

Based on the results of a panel analysis of 35 regencies and cities, it was found that the regencies that have a significant influence on regional spending are Batang Regency, Blora Regency, Karanganyar Regency, Klaten Regency, Kudus Regency, Purbalingga Regency, Semarang.

Based on the results in Figure 2, fiscal decentralization of cities and regencies in 2022 is as follows: Semarang City has the highest index at 51.23%, Magelang City at 38.28%, Pekalongan

City at 26.64%, Surakarta City at 31.91%, Tegal City at 32.61%, and Sukoharjo Regency at 24.58%. Semarang City is the region with the highest level of self-reliance among other regencies or cities in Central Java, with a greater contribution of local revenue compared to transfer funds from the central government. Meanwhile, Magelang City, Surakarta City, Tegal City, and Pekalongan City have a relatively good level of decentralization, although the data shows that there is still dependence on transfer funds.

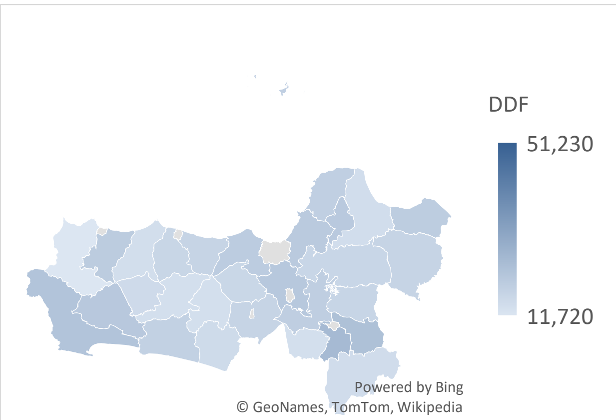

Figure 2. Fiscal Decentralization of Regencies/Cities in Central Java Province in 2022
Source: Processed data, 2022

The lowest self-reliance data is in Brebes Regency at 11.72%. In general, the analysis of this map shows a pattern that big cities in Central Java tend to have higher decentralization than regencies because there is a connection with economic capacity, potential regional income, and support from established industry and trade.

CONCLUSION

This study aimed to examine the factors influencing regional government spending in Central Java Province with a particular focus on population, Human Development Index (HDI), support from the government, and spending effectiveness. Using panel data from 35 districts/cities over the 2015-2023 period to identify the significant determinants of regional expenditures.

The findings indicate that population, HDI, and government support have a significant positive effect on regional spending. This suggests that demographic pressure, development priorities, and intergovernmental support shape budget allocations, which are largely concentrated on operational and personnel expenditures.

On the other hand, the effectiveness ratio does not show a statistically significant effect, implying that the level of spending may depend more on standard budget procedures rather than performance-based outcomes. This not-significant finding raises important considerations.

It is possible that the concept or measurement of "effectiveness" in current policy implementation does not fully capture the real impact of government spending or that existing spending patterns are diven more by administrative routines than by performance evaluation.

Future research should be sxplore alternative indicators or methods to assess budget effectiveness more accurately. In practice policymakers may need to revisit how effectiveness is defined, measured, and integrated into decision-making processes.

To enhance fiscal performance, local goverments should focus on improving budget efficiency, increasing regional fiscal independence, and aligning expenditures with tangible-community outcomes. Moreover, there is a need for clearer classification and transparency in differentiating between operational and capital spending to ensure more strategic use of public resources.

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