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THE IMPACT OF INFRASTRUCTURE SPENDING, SOCIAL ASSISTANCE SPENDING, SUBSIDY SPENDING, AND PERSONNEL SPENDING ON ECONOMIC GROWTH: AN EMPIRICAL STUDY OF 546 LOCAL GOVERNMENTS/34 PROVINCES IN INDONESIA (2021-2024)

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Abstract

In several provinces in Indonesia in recent years, there have been a number of regions that have experienced budget deficits, so special attention is needed to the realization of government spending. This study aims to determine and analyze the impact of infrastructure spending, social assistance spending, subsidy spending, and personnel spending on economic growth in all provinces in Indonesia during 2021-2024. This study uses a quantitative approach with a regression analysis method from secondary data in 34 provinces obtained from the Ministry of Finance data portal. The results of the study show that infrastructure spending and personnel spending have an effect on economic growth. The results of this study can be the basis for local governments in formulating appropriate policies in managing regional spending to increase economic growth and minimize the risk of budget deficits

Keywords: infrastructure spending, social assistance spending, subsidy spending, personnel spending, economic growth

Introduction

Regional Revenue and Spending Budget (APBD) is a regional government financial plan that will be realized in one budget year as stipulated by regional regulations. APBD is a means of communication between the regional government and the community regarding programs and activities carried out by the regional government after coordinating with the legislative body, namely the Regional People's Representative Council (DPRD).

In several cities and regencies in Indonesia in recent years, there are a number of regions that have experienced budget deficits, so special attention is needed to the realization of government spending. Regional deficit is the difference between regional income and regional spending. Regional deficit is covered by regional financing which includes the Use of SILPA, Regional Loans, Use of Reserve Funds, Use of Proceeds from the Sale of Separated Regional Assets, Receipt of Loan Receipts. The 2017 deficit of 47.4 trillion rupiah is 13 trillion rupiah smaller than the 2016 APBD deficit of 60.7 trillion rupiah.

The literature presents mixed findings on the relationship between government spendingand economic performance, particularly in decentralized contexts like Indonesia. For example, Nhemhafuki (2023) found a positive relationship between government spending and economic growth, even after accounting for population size and trade openness, suggesting that well-managed fiscal outlays can support development. Conversely, Li (2024) observed that regional budgets under decentralization may fail to buffer economic volatility and could even contribute to macroeconomic instability if not properly managed.

At the local level, the results are similarly nuanced. In South Minahasa Regency, public spending and investment were found to have a positive but statistically insignificant effect on economic growth (Tumbel, 2018). Meanwhile, in Sumenep Regency, Alwiyah (2014) demonstrated that government spending has a strong and significant impact on local economic development, reinforcing the idea that local fiscal policies can be catalytic when properly aligned. A more detailed sectoral analysis by Angraini (2023) in Jambi Province further revealed that spending on the economic sector had a significant effect on growth, whereas spending on public services showed no measurable impact, underscoring the importance of spending composition.

These diverging outcomes reflect the context-sensitive nature of public spending. The effectiveness of regional budgets in spurring economic growth may vary by region, sector, and fiscal capacity. This study contributes to the ongoing debate by examining whether regional expenditures (particularly under deficit conditions) are growth-inducing across Indonesia’s 34 provinces. By disaggregating expenditures into categories such as infrastructure, personnel compensation, subsidies, and social spending, the study aims to

identify which types of spending have the greatest economic payoff and which might require reform or reallocation.

Economic growth is one of the main indicators in assessing the success of a country's development. In Indonesia, sustainable economic growth is very important to improve people's welfare and reduce poverty levels. One of the factors that plays an important role in driving economic growth is government spending, which is reflected in the APBD.

Based on data from the Central Statistics Agency (BPS), Indonesia's economic growth from 2015 to 2024 shows significant fluctuations. In 2015, growth reached 4.79 percent, and during this period, the average annual growth was around 5 percent, with a peak in 2024 which grew by 5.03 percent. There was a significant decline due to the Covid-19 pandemic, with growth reaching -2.07%, but this was experienced by all countries in the world. The figure rose again in 2021 by 3.69%.

Government spending refers to the spending incurred by regional governments to finance various programs and activities aimed at implementing governance functions and delivering public services to the community (Musgrave & Musgrave, 1989; Bahl & Linn, 1992). These expenditures include capital spending such as infrastructure development, as well as recurrent expenditures like salaries, subsidies, and social spending. The allocation and effectiveness of government spending play a critical role in shaping regional economic performance and promoting inclusive development, especially in decentralized systems like Indonesia.

H1: Infrastructure spending has an impact on Economic Growth

Infrastructure spending is a budget spending for the acquisition of fixed assets and other assets that provide benefits for more than 12 months and are used in regional government activities. consisting of land capital expenditure, machine equipment capital expenditure, building and construction capital expenditure, irrigation road and network capital expenditure, other fixed asset capital spending and other asset capital expenditure. These assets form the backbone of regional economic activity by reducing transaction costs, improving market access, and supporting private sector productivity.

According to the growth theory perspective, infrastructure is a form of public capital that complements private capital and labor, thereby raising the marginal productivity of these inputs (Aschauer, 1989; Barro, 1990). Empirical studies support the view that infrastructure contributes significantly to economic growth, particularly in developing countries.

Calderón and Servén (2010), using panel data for Sub-Saharan Africa, found that both the quantity and quality of infrastructure have robust positive effects on growth and inequality reduction. In the Indonesian context, studies such as those by Resosudarmo and Yusuf (2006) highlight the role of infrastructure in promoting regional convergence and enabling economic transformation outside Java. Given these theoretical and empirical foundations, it is hypothesized that infrastructure spending will have a strong and positive impact on regional GRDP.

H2: Personnel spending has an impact on Economic Growth

Personnel spending consists mainly of salaries and compensation for civil servants and government personnel s. While this type of spending is necessary for operating government institutions and delivering public services, its contribution to economic growth is less straightforward. On one hand, public employment stabilizes household income and consumption, especially in regions where the government is a major employer. On the other hand, excessive personnel spending may reduce fiscal space for productive investments, creating rigidities in budget allocation (Rodríguez-Pose & Ezcurra, 2010).

Gemmell, Kneller & Sanz (2011) found that productive government expenditure, such as investment and education tends to be more growth-enhancing than unproductive components, including public wages and general administration. Nonetheless, in low-income regions with limited private sector employment, personnel spending may indirectly support local economies. In Indonesia, the size of government employment varies significantly across provinces, and in many rural or underdeveloped areas, public sector jobs are among the few stable sources of income. Therefore, while the efficiency of personnel spending may be questionable, it is still expected to exert a modest positive influence on GRDP through the consumption channel.

H3: Subsidy spending has an impact on Economic Growth

Subsidies are transfers provided by the government to reduce the cost of goods and services, often targeting specific economic sectors (such as agriculture, energy, or transportation) or demographic groups. The rationale behind subsidies is to enhance affordability, protect vulnerable populations, and support sectors deemed essential for development. From a Keynesian perspective, subsidies can increase aggregate demand by raising disposable income or reducing production costs, thereby stimulating output and employment (Tanzi, 1998; Gupta et al., 2005).

However, subsidies are often criticized for creating inefficiencies, distorting market prices, and encouraging overconsumption or misallocation of resources. The economic impact of subsidies largely depends on their design and targeting. Coady et al. (2006) argue that poorly targeted subsidies may benefit higher-income groups more than the intended low-income recipients, reducing their effectiveness in promoting inclusive growth. In

Indonesia, subsidies, especially in fuel and food have historically been a large component of public spending, with varying economic effects. Despite these caveats, it is reasonable to expect that subsidy spending may have a positive short-run effect on GRDP, particularly in consumption-driven regions.

H4: Social assistance spending has an impact on Economic Growth

Social assistance spending programs aim to reduce poverty, improve access to basic services, and enhance equity. In endogenous growth models, these effects matter because a healthier, more educated, and more secure population is more productive and capable of sustaining higher growth over time (Barro & Sala-i-Martin, 2004). Social assistance spending also plays a stabilizing role by maintaining household consumption during downturns. In Indonesia, programs such as PKH (Conditional Cash Transfers) and BLT (Direct Cash Transfers) have been shown to reduce vulnerability and improve welfare outcomes (World Bank, 2018). Accordingly, **s**ocial assistance is expected to positively influence regional GRDP, especially in provinces with higher poverty rates.

Based on the hypotheses formulated above, the following conceptual framework is developed to illustrate the relationship between government spending components and regional economic growth.

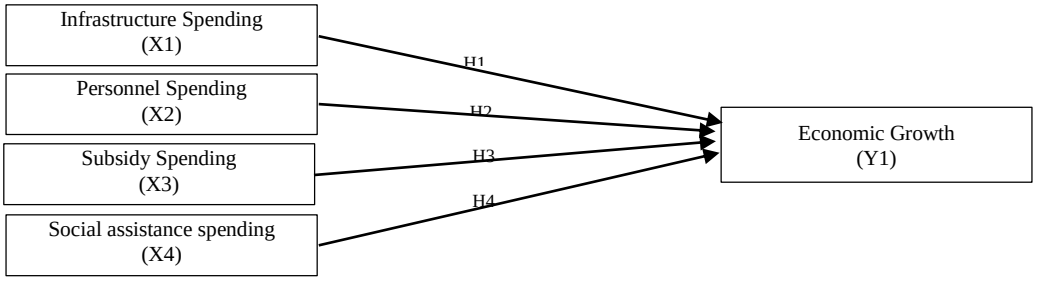

Figure 1. Conceptual Framework

Methods

Economic growth is the main indicator in assessing the success of a region's development. Local governments have a strategic role in supporting the achievement of these goals through effective budget management, especially in regional spending. Regional spending is one of the important instruments that can encourage local economic activity, create jobs, and improve the quality of life of the community.

However, the extent to which regional spending has a positive effect on economic growth still needs to be analyzed in depth. So the objectives of this study are:

1. To analyze the influence, contribution, infrastructure spending, personnel spending, subsidy speding, and social assistance spending on economic growth in Indonesia;
2. To provide policy recommendations on regional spending that is more effective in encouraging sustainable economic growth by controlling the deficit in regional spending.
3. To evaluate the long-term fiscal sustainability of regional spending patterns in relation to their impact on economic performance.

This research will be limited to the Province area in Indonesia. This research will analyze government spending data and economic growth, during the period 2021 to 2024. This study will focus on four types of government spending, namely infrastructure, personnel, subsidy, and social assistance spending. Other variables that may affect economic growth, such as private investment, exports, and monetary policy, will not be analyzed in this study.

This study will use the panel data regression analysis method. Regional spending is presented in regional spending realization figures sourced from the Ministry of Finance data portal, economic growth will be measured using the growth of Gross Regional Domestic Product (GRDP) per capita at current prices from the Central Statistics Agency data.

The variables observed in this study can be explained as follows:

1. Economic Growth is measured using GRDP per capita at current prices from 2021 to 2024, expressed in thousand Rupiah, sourced from BPS.
2. Infrastructure Spending represents capital spending allocated for infrastructure development from 2021 to 2024, measured in billion Rupiah, based on DJPK data.
3. Personnel Spending refers to total spending on regional civil servant salaries and allowances from 2021 to 2024, measured in billion Rupiah, from DJPK.
4. Subsidy Spending captures total government spending on subsidies (Function 3) during 2021 to 2024, measured in billion Rupiah, based on DJPK records.
5. Social Assistance spending includes total spending on social assistance and welfare from 2021 to 2024, measured in billion Rupiah, sourced from DJPK.

Table 1. Operational Definition of Variables

Variable	Indicator / Measurement	Unit	Data Source	Scale
Economic Growth (Y)	Gross Regional Domestic Product at current prices (nominal GRDP)	Billion Rupiahs	BPS (Statistics Indonesia)- GRDP by Expenditure/Production	Ratio
Infrastructure Spending (X_1)	Capital /infrastructure Expenditure	Billion Rupiahs	DJPK-Ministry of Finance	Ratio
Personnel Spending (X_2)	Total spending for regional personnel	Billion Rupiahs	DJPK-Ministry of Finance	Ratio
Subsidy Spending (X_3)	Total government subsidy spending (Function 3)	Billion Rupiahs	DJPK-Ministry of Finance	Ratio
Social Assistance Spending (X_4)	Total social assitance spending	Billion Rupiahs	DJPK-Ministry of Finance	Ratio

The analysis tool used in this study is Multiple Linear Regression Analysis of Panel Data with STATA 17. Used to see the influence between variables in panel data. The formula of multiple linear regression analysis used for this test is as follows:

$$GROWTH_{it} = \alpha + \beta_1 INFRA_{1it} + \beta_2 EMP_{2it} + \beta_3 SUBS_{3it} + \beta_4 SOCIAL_{4it} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Description:
GROWTH = Economic Growth (GRDP 34 Provinces)
α = Constant
β_1- β_4 = Coefficient
INFRA = Infrastructure Spending
EMP = Personnel Spending
SUBS = Subsidy Spending
SOCIAL = Social Assistance Spending
it = Panel Data
ε = Standard Error

Results and Discussions

The following table presents descriptive statistics for the variables used in this study, which include GRDP growth (GROWTH) as the dependent variable and four types of government spending as independent variables: infrastructure spending (INFRA), personnel spending (EMP), subsidy spending (SUBS), and social spending (SOCIAL). The dataset consists of 136 observations, representing panel data from 34 provinces in Indonesia over the period 2021–2024.

Table 2. Descriptive Statistics

Variabel	Obs	Mean	Std. Dev	Min	Max
GROWTH	136	574.519,79	808217,08	43893,26	3.679.358,60
INFRA	136	1.327,93	1473,41	176,34	10.053,14
EMP	136	2.521,17	3120,72	473,18	18.816,24
SUBS	136	168,17	912,35	0,00	6.278,33
SOCIAL	136	165,40	793,35	0,00	6.528,36

In the regression model estimation method using panel data, it can be done through three approaches, including the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM). Based on the estimation, the model used is the Fixed Effect Model. First, the Chow Test was used to compare CEM and FEM. The results rejected the null hypothesis, indicating that the Fixed Effect Model is more suitable than the Pooled OLS model.

Table 3. Chow Test

F(4,98)	= 16.35
Prob > F	= 0.0000

This indicates that the null hypothesis (which assumes that the Common Effect Model is appropriate) is rejected at the 1% significance level. Therefore, the Fixed Effect Model (FEM) is more suitable than the

Common Effect Model (CEM). Next, the Hausman Test was applied to choose between FEM and REM. The test result was significant, suggesting that the unobserved provincial effects are correlated with the independent variables. Hence, the Fixed Effect Model is preferred over the Random Effect Model.

Table 4. Hausman Test

chi2(4)	= (b-B)'[(V_b-V_B)^(-1)](b-B)
	= 17.42
Prob > chi2	= 0.0016

The test produced a Chi-square statistic of 17.42 with a p-value of 0.0016. Since the p-value is below the 5% significance level, the null hypothesis is rejected. This indicates that the unique errors (unobserved individual effects) are correlated with the independent variables, and therefore, the Fixed Effect Model (FEM) is more consistent and should be used.

The Fixed Effect Model (FEM) was employed to estimate the influence of various categories of regional government spending on economic growth (measured by GRDP) across 34 provinces in Indonesia from 2021 to 2024. The regression output is summarized in Table X.

Table 5. Fixed Effect Model Estimation Results

GROWTH	Coefficient	Std. err.	t	P>t	[95% conf. interval]
INFRA	0,0445847	0,0214057	2,08	0,040	0,0021058 0,0870636
EMP	0,4401476	0,0588764	7,48	0,000	0,3233094 0,5569859
SUBS	0,1649378	0,0825569	2,00	0,049	0,0011064 0,3287693
SOCIAL	-0,0087782	0,0268883	0,33	0,745	-0,0621372 0,0445808
_cons	32,57856	4,595851	7,09	0,000	23,45824 41,69888
Number of Observation		136		F(4,98)	16.35
Number of Group		34		Prob > F	0,0000
R-square		0,7526			

The results of the fixed-effect model estimation show that the increase in government spending is in line with the increase in economic growth. Where the value of the infrastructure spending coefficient is 5.50201, and the value of the personnel spending coefficient is 8.120624, which is positive. This means that the increase in infrastructure spending and personnel spending in 34 provinces in Indonesia increases economic growth.

The regression results show that three of the four government spending variables—infrastructure spending, personnel spending, and subsidy spending—have a statistically significant positive effect on economic growth, while social assistance spending does not show a significant relationship.

Infrastructure spending (INFRA) has a positive and statistically significant coefficient of 0.0446 ($p = 0.040$), suggesting that an increase in infrastructure spending contributes to regional economic growth. This supports the notion that investments in physical infrastructure improve productivity and regional connectivity, thus boosting GRDP.

Personnel spending (EMP) shows the strongest positive impact, with a coefficient of 0.4401 and a highly significant $p\text{-value} < 0.01$. This suggests that, when managed effectively, operational expenditures related to civil servants can enhance institutional performance and economic coordination at the regional level.

Subsidy spending (SUBS) also exhibits a positive and statistically significant effect (0.1649, $p = 0.049$). Although less impactful than infrastructure and personnel spending, subsidies may stimulate economic activity by supporting sectors like agriculture, energy, and transportation in the short term.

Social spending (SOCIAL) has a negative but statistically insignificant coefficient (-0.0088, $p = 0.745$), indicating that this type of spending has no measurable effect on short-term economic growth. This may be due to the redistributive nature of social spending, which targets welfare rather than productive investment.

The model's R-squared value of 0.7526 indicates that approximately 75.26% of the variation in regional economic growth is explained by the four types of government spending included in the model. The F-statistic of 16.35 with a p-value of 0.0000 confirms the overall significance of the model.

The research results are in line with the research of Zahari, M. (2017), who found that increasing government spending on regional economic development activities had a positive effect on increasing economic growth in Jambi Province.

Based on the result of the regression test, the regression equation obtained is as follows:

$$GROWTH_{it} = \alpha + 0{,}04458466\,INFRA_{1it} + 0{,}44014764\,EMP_{2it} + 0{,}16493784\,SUBS_{3it} + -0{,}0087782\,SOCIAL_{4it} + \varepsilon \quad \ldots\ldots 2$$

Table 6. Model Comparison (OLS vs FEM vs REM)

Variable	OLS	FEM	REM
INFRA	0,0597595	0,04458466*	0,0541953*
EMP	0,8477042***	0,44014764***	0,5629066***
SUBS	0,0953695	0,16493784*	0,1929663*
SOCIAL	-0,049327	-0,0087782	-0,017040
_cons	73.748.575	320,578562***	230,44840***
N	136	136	136
r2	0,75781203	0,40021454	
r2_a	0,75041698	0,17376492	

* p<0.05; ** p<0.01; *** p<0.001

Multicollinearity was tested using the Variance Inflation Factor (VIF) to assess whether the independent variables are highly correlated with one another. Table 7 shows that the mean VIF is 1.41, and the individual VIF values for each variable are all below the common threshold of 10, as suggested by Gujarati & Porter (2009), and far below the stricter threshold of 5 (as per O'Brien, 2007).

Table 7. Multicollinearity Test

Variable	VIF	1/VIF
EMP	1.68	0.595290
INFRA	1.57	0.637878
SOCIAL	1.31	0.764951
SUBS	1.08	0.927192
Mean VIF	1.41	

The results indicate that multicollinearity is not a concern in this model. The independent variables used in the regression are sufficiently independent of one another, and thus the estimated coefficients can be interpreted reliably.

Table 8. Hypothesis Test Summary

No	Hypothesis	β	Sig	α	Result
1	H1: Infrastructure spending has an impact on Economic Growth	0,04458466	0,040	0,05	Accepted
2	H2: Personnel spending has an impact on Economic Growth	0,44014764	0,000	0,01	Accepted
3	H3: Subsidy spending has an impact on Economic Growth	0,16493784	0,049	0,05	Accepted
4	H4: Social spending has an impact on Economic Growth	-0,0087782	0,745	0,05	Rejected

Results and Discussions

The regression results show that infrastructure spending, personnel spending, and subsidy spending all have a significant positive relationship with economic growth. However, social spending does not appear to have a meaningful impact.

The results show that infrastructure spending has a positive and statistically significant effect on economic growth. This is consistent with economic theory and prior empirical studies that argue public investment in infrastructure can improve productivity by lowering transaction costs, enhancing mobility, and facilitating trade and investment. In developing countries like Indonesia, where infrastructure gaps remain a major constraint, even modest increases in spending on roads, ports, electricity, and water supply can produce measurable improvements in regional output (Calderón & Servén, 2010). In this context, the finding supports the view that infrastructure spending plays a catalytic role in stimulating economic activity, especially in regions that are less developed or more isolated.

Personnel spending shows the strongest and most consistent positive relationship with economic growth. This result might reflect several underlying mechanisms. First, public personnels are central to the delivery of government services, including education, health, licensing, and civil administration. The salaries paid to these workers circulate within local economies, contributing to household consumption and service demand. Second, in regions where the government is one of the largest employers, especially outside Java, personnel spending may indirectly support growth by maintaining social stability and administrative continuity. However, this result must be viewed critically. A positive effect on economic growth does not automatically imply that personnel spending is efficient or sustainable. Many local governments in Indonesia allocate over 50 percent

of their budgets to routine expenditures, mostly salaries and benefits. While this may support short-term consumption, it raises concerns about fiscal rigidity and crowding out of capital expenditures that could have higher long-term returns. The result highlights a trade-off between maintaining government operations and pursuing development-oriented spending.

Subsidy spending is also positively associated with economic growth, though the effect is smaller than that of personnel spending. Subsidies can play a stabilizing role, especially when targeted toward key sectors like agriculture, energy, or small business. For example, subsidies for fertilizers or transportation costs can lower production expenses and increase output. In some cases, they can also protect vulnerable groups from price volatility. However, the effectiveness of subsidy programs largely depends on design, targeting, and monitoring. Poorly targeted subsidies may benefit wealthier groups or become fiscally unsustainable. While this study finds a positive link with growth, it does not assess whether these subsidies were efficiently allocated. That would require additional analysis of how subsidies are distributed across sectors and income groups. Nevertheless, the results suggest that subsidies, when properly directed, can contribute to regional economic activity.

The only spending category that does not show a significant effect is social spending. The coefficient is negative but not statistically meaningful. This may indicate that social protection spending, although important for reducing poverty and inequality, does not directly influence regional GDP in the short term. Social programs such as cash transfers or food aid may help household smooth consumption, but they are unlikely to result in immediate productivity gains unless accompanied by broader development strategies. While programs like PKH and BLT in Indonesia help reduce poverty and build human capital, their short-term impact on GDP may be marginal (World Bank, 2018). Their main contribution is long-term and often indirect, such as improving children's health or education. Effects that may not be fully realized within the study's four-year timeframe.

Another possibility is that the scale of social spending in Indonesia is still relatively small compared to infrastructure or personnel budgets. Moreover, if the targeting is weak or the coverage is limited, the macroeconomic effects may be negligible. This result does not imply that social spending should be reduced, but rather that its role in supporting inclusive growth may not be captured through GDP measures alone. It is also possible that the time horizon of this study, covering only four years, is too short to observe the longer-term effects of improved human capital through better social safety nets.

These findings underscore the importance of spending composition in public finance. Simply increasing total spending does not guarantee growth unless the funds are allocated toward activities with a real economic impact. The evidence from this study suggests that capital spending (infrastructure), targeted subsidies, and essential personnel -related services contribute more directly to regional output, while transfers and social support may play a more indirect or delayed role. This aligns with the fiscal multiplier literature, which generally finds that capital expenditures have higher growth effects than current expenditures (Ilzetzki et al., 2013).

From a policy perspective, the results suggest that local governments in Indonesia should pay more attention to the quality and structure of their budgets. Regions that rely heavily on personnel salaries and social transfers may be limiting their capacity to invest in infrastructure or productive sectors. While it is politically difficult to reduce routine spending, gradual reforms aimed at improving spending efficiency, controlling payroll growth, and enhancing the targeting of subsidies and social programs can open fiscal space for more growth-oriented investments. At the same time, policies that support better infrastructure planning and implementation could enhance the long-run returns of public investment.

Acknowledgement

The estimation results show that the infrastructure, personnel, and subsidy spending are associated with positive has a positive influence on the value of Economic Growth outcomes, while social spending spending does not show a statistically significant effect. These patterns suggest that budget reallocation, rather than simply increasing total spending, may be a more effective strategy for promoting regional growth. This result is in accordance with the theory that states that there is a positive relationship between Government Spending and Economic Growth. This shows that the increase in Government Spending carried out by the government is able to significantly drive economic growth in 34 Provinces in Indonesia.

In order to encourage economic growth, the government needs to formulate development strategies and allocation of public service spending to provide more targeted and targeted public facilities to help facilitate economic activities in local communities. Further research could explore the distributional effects of spending and examine whether similar patterns hold at the district level or in other time periods.

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