WHAT DRIVES CAPITAL EXPENDITURE IN INDUSTRIAL REGIONS? EVIDENCE FROM CENTRAL JAVA, INDONESIA

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ABSTRACT

This study examines how fiscal capacity influences public investment in industrial-based regions by analyzing the effects of economic growth, Local Own-Source Revenue (PAD), and the General Allocation Fund (DAU) on local government capital expenditure in Central Java during 2018–2024. While fiscal decentralization studies in Indonesia largely focus on transfer dependency and aggregate provincial performance, limited attention has been given to industrial regions where economic expansion may reshape local fiscal dynamics. Using panel data from seven industrial-regional governments, this study addresses that gap. The findings indicate that economic growth, PAD, and DAU exert a positive influence on capital expenditure. The process of industrial expansion has been demonstrated to increase fiscal space and investment incentives. Furthermore, stronger local revenue mobilisation has been shown to enhance fiscal autonomy and development responsiveness. Concurrently, intergovernmental transfers continue to play a pivotal role in fostering regional investment, including in economically vibrant regions. This study makes a contribution to the existing literature on fiscal decentralisation by highlighting a dual fiscal mechanism in industrial regions. The results of the study highlight the necessity of achieving a balance between local revenue strengthening and transfer design in order to ensure the sustainability of productive public investment.

1. INTRODUCTION

Capital expenditure is one of the main elements in the Regional Revenue and Expenditure Budget (APBD) that reflects the local government's commitment to long-term investment through the provision of fixed assets and public infrastructure development (Sens et al., 2022). According to Buana et al. (2018), capital expenditure not only illustrates the direction of development policy, but also reflects the quality of regional financial management, particularly in terms of budget efficiency, financial management accountability, and the implementation of value for money principles.

Optimal capital expenditure management plays an important role in increasing regional infrastructure capacity, facilitating economic connectivity, and strengthening the performance of strategic economic sectors, including the industrial sector, which contributes significantly to national economic growth (Kusumawardani et al., 2024).

The fiscal decentralisation system places capital expenditure realisation as a policy that is highly influenced by regional fiscal capacity and regional economic dynamics (Aritenang & Chandramidi, 2023). Economic growth and Regional Original Revenue (PAD) are fundamental indicators that reflect fiscal capacity and the resilience of the regional economic structure (Manik, 2023). This is supported by the findings of Mukashov & Thurlow (2025), who state that these two variables reflect the independence of local governments in financing development without excessive dependence on fiscal transfers from the central government. Furthermore, a study Aizenman et al. (2019) argues that increased economic growth will expand the regional revenue base through increased production and consumption activities, while an increase in PAD indicates the optimisation of local economic potential (Santos-Marquez et al., 2022). These conditions have implications for increasing the ability of local governments to allocate capital expenditure (Zhang et al., 2025).

In Indonesia, the implementation of fiscal decentralisation places local governments as the main actors in development management and public service provision (Kis-Katos & Sjahrir, 2017). One important instrument in this system is the General Allocation Fund (DAU), which is a fiscal transfer mechanism from the central government to reduce financial capacity disparities between regions (Akita et al., 2021). The DAU aims to ensure that each region has the minimum fiscal capacity to carry out government and development functions (Andhini et al., 2023). The fiscal capacity of a region is essentially closely related to the economic structure and leading sectors that are developing in that region (Adam et al., 2014). In the context of Indonesia's economic development, the industrial sector plays a very important role in driving structural economic transformation (Putra et al., 2025), increased product added value (Ismayani, 2016), job creation (Fevriera et al., 2022), and strengthened national competitiveness (Kusumawardani et al., 2024).

Central Java Province is one of the regions in Indonesia that has experienced rapid industrial development, supported by the availability of labour, improved infrastructure development, and local government policies that are conducive to investment (Prajanti et al., 2025). A number of areas in Central Java Province that have a high level of industrial concentration include Sukoharjo Regency, Karanganyar Regency, Demak Regency, Semarang Regency, Kendal Regency, Batang Regency, and Semarang City. These areas have developed as integrated manufacturing centres that contribute to the regional economy and regional expenditure allocation. The existence of the Kendal Industrial Estate, the Terboyo Industrial Estate in Semarang City, and various manufacturing centres in Sukoharjo and Karanganyar Regency further strengthen the role of these regions as drivers of economic growth and as potential sources of increased regional income (Pamungkas, 2022).

The development of the industrial sector in Central Java is expected to increase regional fiscal capacity through increased economic activity and regional revenue, which in turn will encourage the allocation of capital expenditure as an instrument for economic infrastructure development. Adequate infrastructure plays an important role in supporting production efficiency, distribution, and regional connectivity. However, increased economic activity is not always followed by the optimisation of local government capital expenditure. During the 2018-2024 period, economic growth, regional revenue, and general allocation funds in Indonesia, especially in Central Java, showed significant fluctuations, mainly due to economic pressures during the COVID-19 pandemic, which reduced regional revenue and shifted government spending priorities (Ambaw et al., 2023; Nasution et al., 2020).

A previous study shows that PAD tends to have a positive effect on capital expenditure because it reflects regional fiscal independence (Badriah et al., 2019; Yusuf et al., 2023). General allocation funds also play a role in increasing regional spending capacity, especially in regions with limited PAD (Andhini et al., 2023). However, several other studies still show inconsistent results, regarding the effect of DAU and economic growth on capital expenditure (Adur et al., 2019).

This inconsistency indicates that the relationship between variables is greatly influenced by regional characteristics, regional economic structure, and the quality of government financial management in each region.

Through this study, we attempt to analyse how the dynamics of regional expenditure allocation are influenced by economic growth, regional income, and general allocation funds in seven industrial regions in Central Java Province for the period 2018-2024, namely Sukoharjo Regency, Karanganyar Regency, Demak Regency, Semarang Regency, Kendal Regency, Batang Regency, and Semarang City. These seven regions are known as areas with relatively high levels of industrial activity and are an important part of the regional economic structure in Central Java Province. In addition, the characteristics of industrial areas that require economic infrastructure development result in relatively high capital expenditure requirements. We hypothesise that although government expenditure allocations underwent restructuring during our research period, in our view, economic growth, regional income, and general allocation funds in these regions with leading industrial sectors will continue to have a positive effect on capital expenditure allocations for 2018-2024.

2. RESEARCH METHODS

This study employs a quantitative approach using multiple regression analysis estimated through the Ordinary Least Squares (OLS) method to examine the effects of economic growth, Local Own-Source Revenue (PAD), and General Allocation Funds (DAU) on local government capital expenditure. The analysis is based on secondary data obtained from Local Government Budget Realization Reports (LRA), publications of the Central Statistics Agency (BPS), and the Directorate General of Fiscal Balance (DJPK) for the period 2018–2024.

The model is intentionally specified in a parsimonious form to capture the direct fiscal transmission mechanism between revenue capacity and capital expenditure. OLS is selected as a baseline estimator because the objective of this study is to identify the average partial effects of fiscal variables under observed budgetary conditions, rather than to construct a structural or dynamic specification. By avoiding excessive parameterization, the model aims to reflect actual fiscal behavior more transparently and reduce the risk of overfitting.

The choice of variables is theoretically grounded in fiscal decentralization and public finance frameworks, where economic growth represents endogenous fiscal capacity expansion, PAD captures local fiscal autonomy, and DAU reflects intergovernmental transfer support. Standard diagnostic procedures are conducted to ensure the validity of classical assumptions, thereby strengthening the reliability of the estimated relationships.

Table 1. Research Sample Selection

Selection Stage	Criteria	Total
Initial population	All regencies/municipalities in Central Java Province	35 regions
Criterion 1	Regencies/municipalities with relatively high industrial activity	7 regions
Criterion 2	Regencies/municipalities classified as strategic industrial areas in Central Java	7 regions
Criterion 3	Regencies/municipalities with complete data on Local Own-Source Revenue (PAD), General Allocation Fund (DAU), and Capital Expenditure for the period 2018–2024	7 regions
Final sample	Sukoharjo Regency, Karanganyar Regency, Demak Regency, Semarang Regency, Kendal Regency, Batang Regency, and Semarang City	7 regions

Source: Authors' data analysis (2025)

This study's data analysis was conducted using multiple linear regression with the following econometric model.

$$LOGMODAL_{it} = PE_{it} + LOGPAD_{it} + LOGDAU_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

where MODAL is capital expenditure, PE represents economic growth, PAD is local revenue, and DAU is general allocation funds in seven industrial areas in Central Java, while LOG is the natural logarithm.

The objects of this study are seven industrial areas in Central Java Province for the period 2018-2024 (see Table 1), namely Sukoharjo Regency, Karanganyar Regency, Demak Regency, Semarang Regency, Kendal Regency, Batang Regency, and Semarang City. These seven regions are known as areas with relatively high levels of industrial activity and are an important part of the regional economic structure of Central Java. The dependent variable in this study is local government capital expenditure, measured based on the total realisation of capital expenditure in the Regional Revenue and Expenditure Budget (APBD). The independent variables include economic growth, proxied by the economic growth rate, the realisation of PAD revenue, and DAU, measured based on the total general transfer funds from the central government.

3. RESULTS AND DISCUSSION
3.1. RESULTS

During the period 2018-2024, the economic and fiscal characteristics of seven industrial areas in Central Java Province showed diverse dynamics. Table 2 show the descriptive statistics. Economic growth averaged 4.319 per cent with a median value of 5.390 per cent, indicating that economic performance was not entirely uniform and was influenced by several periods with lower achievements. The fairly wide range of growth, from a high of 6.810 per cent to a low of -2.670 per cent, reflects economic cycle fluctuations, including a slowdown phase during certain periods.

Table 2. Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
Economic Growth (PE)	4.319	5.390	6.810	−2.670	2.560
Local Own-Source Revenue (PAD)	692.922	445.010	2,885.770	237.550	682.982
Capital Expenditure (MODAL)	368.350	279.920	1,228.460	108.460	280.036
General Allocation Fund (DAU)	942.872	909.560	1,317.690	737.690	132.652

Source: EViews output, 2025

Economic diversity is reflected in a standard deviation of 2.560, indicating that the status of industrial areas does not produce homogeneous economic performance across regions, thereby potentially affecting regional fiscal capacity. From a regional financial perspective, PAD shows very high variation with an average of 692,922 and a median of 445,010, indicating fiscal capacity disparities between industrial regions. In contrast, DAU has a relatively more even distribution with an average of 942,872 and a lower level of data dispersion, thus confirming its role as an instrument of fiscal equalisation.

The capital expenditure variable has an average of 368,350 with a median of 279,920, indicating a tendency for asymmetric data distribution. The maximum value of 1,228,460 and the minimum value of 108,460 indicate considerable variation in capital expenditure allocation between regions and observation periods. This condition indicates that differences in economic performance and regional fiscal capacity, whether sourced from PAD or central transfers, have the potential to affect variations in capital expenditure.

Based on the estimation results, the regression model is expressed as follows:

$$LOGMODAL_{it} = -5{,}743 + 0{,}054\ PE_{it} + 0{,}534\ LOGPAD_{it} + 1{,}152\ LOGDAU_{it} \quad \text{......................} \quad (2)$$

where all three independent variables are statistically significant at the 5% significance level, with probability values of 0.001, 0.000, and 0.042, respectively.

The model demonstrates a good fit, with an R-squared value of 0.810, indicating that approximately 81% of the variation in the dependent variable is explained by the independent variables. The Adjusted R-squared of 0.797 confirms this after accounting for the number of predictors, while the F-statistic of 63.952 with a probability of 0.000 suggests that the model is jointly significant overall.

Regarding classical assumption tests, the Jarque-Bera test yields a statistic of 0.352 with a probability of 0.838, indicating that the residuals are normally distributed. Additionally, the White test for heteroskedasticity produces a chi-square statistic of 11.236 with a probability of 0.129, suggesting that there is no evidence of heteroskedasticity in the model. These results confirm that the model satisfies the key classical assumptions required for reliable ordinary least squares estimation.

Table 3. Correlation Matrix

	LNMODAL	PE	LNPAD	LNDAU
LNMODAL	1,000	0,343	0,849	0,822
PE	0,343	1,000	0,091	0,173
LNPAD	0,849	0,091	1,000	0,857
LNDAU	0,822	0,173	0,857	1,000

Source: EViews output, 2025

Based on the estimation results, it is known that the model used is valid with a coefficient of determination of 0.797, meaning that 79.7% of the variation in government capital expenditure in seven industrial areas in Central Java Province can be explained by the variables of economic growth, PAD, and DAU. The remaining 20.3% is influenced by other variables or factors not included in the model. In addition, the results of testing using Jarque-Bera statistics show a JB value of 0.352 with a probability level of 0.838. This probability value is above the 5 per cent significance limit, so the residuals are normally distributed. Meanwhile, the Likelihood Ratio value is 11.236 with a probability of 0.129. Thus, the model used does not experience heteroscedasticity problems and has met the homoscedasticity assumption.

Based on the correlation matrix in Table 3, economic growth shows a relatively low level of correlation with the Local Own-Source Revenue (LNPAD) and General Allocation Fund (LNDAU) variables, at 0.091 and 0.173, respectively. These values are well below the critical correlation threshold, indicating that there is no strong linear relationship between economic growth and fiscal variables. Conversely, the correlation between LNPAD and LNDAU is quite high at 0.857. This relationship reflects the structural interconnection of regional funding sources, given that both represent the fiscal capacity of local governments.

Table 4. t-Test Results

Variable	Coefficient	Probability	Criterion	Conclusion
Economic Growth (PE)	0.054	0.001	< 0.01	Significant at $\alpha = 0.05$
Log(Local Own-Source Revenue) (LOGPAD)	0.534	0.000	< 0.01	Significant at $\alpha = 0.05$
Log(General Allocation Fund) (LOGDAU)	1.152	0.042	≤ 0.05	Significant at $\alpha = 0.05$

Source: EViews output, 2025

The regression model in Table 4, shows that all major independent variables have positive coefficients, indicating a direct relationship with capital expenditure. The economic growth variable (PE) has a coefficient of 0.054 and is statistically significant at a 5 per cent significance level (Prob. 0.001). This finding implies that improvements in regional economic performance are systematically followed by higher public investment. This relationship reflects the expansion of the local revenue base and increased fiscal space, particularly in industrial regions where economic activity intensifies infrastructure demand. This finding aligns with Aizenman et al. (2019) proposition that economic growth increases the scale and complexity of public expenditure, especially capital formation.

3.2. DISCUSSION

Local revenue shows a positive and significant effect on capital expenditure with a coefficient of 0.534 and a probability value of 0.000; indicating a relatively strong responsiveness of capital expenditure to improvements in fiscal autonomy. This high significance also confirms that an increase in local revenue capacity plays an important role in encouraging capital expenditure allocation. This reflects that the greater the ability of a region to explore its own sources of revenue, the greater the fiscal flexibility to finance infrastructure development and other productive assets.

Meanwhile, the general allocation funds also have a positive coefficient of 1.152 and are significant at a 5 per cent significance level (Prob. 0.042). These results indicate that fiscal transfers from the central government remain an important factor in supporting regional capital expenditure. Thus, DAU functions as a fiscal stabilisation instrument that helps local governments maintain the continuity of public investment, especially for regions with limited PAD.

The results show that economic growth has a positive and significant effect on government capital expenditure in seven industrial areas in Central Java Province. These results indicate that increased production and consumption activities drive the expansion of the regional revenue base, both directly and indirectly, thereby increasing the fiscal capacity of local governments to undertake public investment. In addition, economic growth also increases the need for supporting infrastructure, particularly in industrial areas experiencing intensified economic activity. These results reinforce Musgraves (1959) view of the link between economic growth and increased public spending, and are consistent with the findings of Afonso & Fraga (2024) and Benbitour et al. (2024), which show that capital expenditure serves as an instrument to support sustainable growth.

The positive and significant effect of PAD on capital expenditure confirms that regional fiscal autonomy is a major determinant of public investment. Theoretically, these results are in line with Oates' (1972) fiscal decentralisation framework, which emphasises that local governments with stronger revenue capacities tend to be more efficient in allocating development expenditure. These results are consistent with the findings of (Buana et al., 2018). High PAD provides greater fiscal flexibility, so that local governments not only increase capital expenditure but also have the flexibility to determine development priorities.

The General Allocation Fund (DAU) has been proven to have a positive and significant effect on capital expenditure, although its contribution is relatively smaller than PAD. This shows that an increase in DAU revenue can increase the fiscal capacity of regions to finance infrastructure development and public investment. As one of the components of central government transfers, DAU serves to close the fiscal gap between regions so that local governments have more leeway in allocating budgets for productive spending.

The greater the transfer funds received by a region, the greater the opportunity for the local government to improve the development of facilities and infrastructure that support economic growth and public services. This result is consistent with the concept of intergovernmental fiscal relations, where the General Allocation Fund (DAU) functions as an instrument for fiscal equalisation and regional stabilisation. As highlighted by Pradana & Handayani (2023), fiscal transfers from the central government play a crucial role in strengthening regional financial capacity, particularly in supporting development financing through capital expenditure. Thus, the existence of DAU not only functions as a source of funding but also as a driver for improving the quality of regional development.

4. CONCLUSION

This study aims to examine the relationship between economic growth, Local Own-Source Revenue (PAD), and General Allocation Fund (DAU) on local government capital expenditure in seven industrial areas in Central Java Province for the period 2018-2024. The results of panel data analysis show that economic growth has a positive and significant effect on capital expenditure. This condition indicates that increased regional economic activity can increase the fiscal capacity of local governments, thereby providing more scope for public investment financing, particularly infrastructure development.

PAD has been proven to make a positive and significant contribution to increased capital expenditure. This finding indicates that the ability of regions to explore their own sources of revenue plays an important role in determining the capacity for development financing. Regions with higher levels of fiscal independence tend to have greater flexibility in allocating budgets for productive and long-term oriented spending. Furthermore, DAU shows a positive and significant effect on capital expenditure. This result confirms that fiscal transfers from the central government remain an important instrument in supporting regional development financing, especially for regions that need to improve the quality of their infrastructure.

Policy implications should therefore be aligned with these empirical results. Strengthening local revenue mobilization and improving the effectiveness of transfer allocation toward productive capital expenditure may enhance regional development outcomes. Future research may expand the sample coverage, incorporate additional control variables, or apply alternative econometric approaches to further examine the dynamic interaction between fiscal capacity and public investment.

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