



Analysis of the Impact of Operational Expenditure and Capital Expenditure on Economic Growth in Kutai Kartanegara Regency (2012–2024)

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Abstract

This study examines the effects of operational expenditure, capital expenditure, and the COVID-19 pandemic on economic growth in Kutai Kartanegara Regency, East Kalimantan, from 2012 to 2024. Grounded in Keynesian Macroeconomic Theory and Musgrave's Theory of Public Finance, it applies Ordinary Least Squares regression to 13 observations. Diagnostic tests confirm the model satisfies OLS assumptions. The variables jointly significantly affect real Gross Regional Domestic Product ($F = 6.932$; $p = 0.010$), with an adjusted R^2 of 0.597. Operational expenditure exerts a positive and significant effect ($p = 0.002$), making it the dominant fiscal driver. Conversely, capital expenditure ($p = 0.237$) and the pandemic dummy ($p = 0.359$) have no significant partial effects. The findings indicate that operational spending sustains short-term aggregate demand, whereas capital spending may be weakened by implementation lags and volatility. Regional fiscal policy should strengthen spending efficiency and improve the planning and execution of productive infrastructure investment.

1. Introduction

In the architecture of Indonesian fiscal decentralization, the Regional Revenue and Expenditure Budget (APBD) plays a vital role not merely as an administrative accounting document, but as a primary macroeconomic policy instrument at the subnational level (Mardiasmo, 2021). Under decentralization, local governments possess autonomous authority to allocate public resources to foster economic development, promote regional self-reliance, and enhance social welfare (Sjafrizal, 2016). Consequently, the capacity of local budgetary expenditures to effectively stimulate regional economic activities lies at the core of sound public financial governance.

The theoretical foundation underlying public expenditure as a driver of economic growth is deeply rooted in Keynesian macroeconomics. In *The General Theory of Employment, Interest and Money*, John Maynard Keynes (1936) posited that during periods of economic deceleration or recessions, aggregate demand—specifically public expenditure—acts as the chief catalyst for recovery. Government spending (G) serves as an autonomous fiscal injection that expands national and regional output through multiplier effects. In a regional context, budgetary allocations for operational expenditure (OE) and capital expenditure (CE) are designed to boost local aggregate demand, stimulate private consumption, and encourage capital accumulation, thereby accelerating regional economic growth (Mankiw, 2021).

This Keynesian perspective was further elaborated by Richard Musgrave (1959) in *The Theory of Public Finance*, which categorized public financial policy into three distinct core functions: allocation, distribution, and stabilization (Putra et al., 2025). The allocation function addresses the provision of public goods and infrastructure (such as transport networks, education, and health facilities) that the market mechanism fails to supply efficiently (Murdaya & Syahril, 2022). The distribution function seeks to mitigate income inequality through redistributive fiscal transfers (Syafila et al., 2025). Meanwhile, the stabilization function empowers the state to deploy fiscal policy tools to maintain macroeconomic stability, control inflationary pressures, and buffer against cyclical downturns (Musgrave & Musgrave, 1989). Public capital expenditure directly reflects the allocation function by building long-term productive assets, whereas operational expenditure—comprising civil servant compensation and public goods/ services purchases—supports both the allocation and stabilization functions by injecting immediate liquidity into the local economy.

Musgrave's stabilization function is particularly relevant when applied to resource-rich economies such as Kutai Kartanegara Regency in East Kalimantan. As a region highly reliant on non-renewable extractive sectors—specifically oil, natural gas, and coal mining—Kutai Kartanegara's economy is acutely exposed to global commodity price volatility (BPS Kutai Kartanegara, 2024). In this context, local fiscal policy must operate counter-cyclically to cushion the economy when private and extractive sector growth decelerates (Sukirno, 2015).

However, empirical observations in Kutai Kartanegara reveal an evident disconnect. Despite steady growth in total municipal budget allocations over recent years, regional economic growth has displayed substantial volatility, even prior to the outbreak of the COVID-19 pandemic. Empirical literature regarding the effectiveness of local government spending yields mixed findings. On one hand, several studies confirm that capital expenditure significantly boosts regional growth (Nofriyanti & Silalahi, 2019; Aulia et al., 2024; Kirana & Susilo, 2024). On the other hand, studies by Fitri & Putri (2019) and Ayu et al. (2020) demonstrate that operational components (personnel and goods/services spending) exert a positive impact on regional output, whereas capital expenditure yields an insignificant or even negative short-term effect. Furthermore, Kermite et al. (2023) and Kartika (2024) note that capital expenditure involves substantial time lags before infrastructure benefits materialize.

These contradictory findings highlight a critical research gap regarding the short-term versus long-term potency of fiscal expenditure types in resource-dependent subnational economies. This urgency was further compounded by the unprecedented macroeconomic shock caused by the COVID-19 pandemic starting in 2020. The pandemic necessitated extensive emergency budget reallocations (budget refocusing) (Rachmadani & Martani, 2021), potentially altering the structural relationship between public spending and economic output (Agustina & Wardoyo, 2024). To address these issues, this study empirically investigates: (1) the impact of operational expenditure on economic growth in Kutai Kartanegara Regency; (2) the impact of capital expenditure on economic growth; and (3) the structural shock impact of the COVID-19 pandemic during the period 2012–2024.

2. Research Method

This study employs a quantitative causal-associative design using a 13-year annual time-series dataset from 2012 to 2024 ($n = 13$). The selection of 2012 as the starting point ensures empirical data integrity, as 2012 marks the first financial year in which the Regional Financial Audit Report (LKPD) of Kutai Kartanegara Regency earned an Unqualified Opinion (Wajar Tanpa

Pengecualian / WTP) from the Audit Board of the Republic of Indonesia (BPK RI). This guarantees that budget execution data strictly comply with standard public accounting principles.

This study employs one dependent variable and three independent variables. The dependent variable, Economic Growth (Y), is proxied by the Real Gross Regional Domestic Product (GRDP) of Kutai Kartanegara Regency at 2010 constant market prices and is measured in billion IDR. The first independent variable, Operational Expenditure (X1), represents the total annual realized operational expenditure of the regional government, measured in billion IDR. The second independent variable, Capital Expenditure (X2), refers to the total annual realized capital expenditure of the regional government, also measured in billion IDR. The third independent variable, the Pandemic Dummy (X3), captures the COVID-19 crisis and associated budget-refocusing period. It is coded as 1 for the pandemic years of 2020, 2021, and 2022 and as 0 for the non-pandemic years, comprising 2012–2019 and 2023–2024.

Secondary data were acquired from official publications of Statistics Indonesia (BPS East Kalimantan Province & BPS Kutai Kartanegara Regency) for GRDP figures, and the Regional Financial and Asset Management Agency (BPKAD) of Kutai Kartanegara Regency for Budget Realization Reports (LRA). The baseline Ordinary Least Squares (OLS) multiple linear regression equation is specified as follows:

$$\text{Growth_}Y_t = \beta_0 + \beta_1 BO_t + \beta_2 BM_t + \beta_3 DPandemi_t + \varepsilon_t$$

Where:

Growth_ Y_t = Economic Growth (RGDP at Constant Prices) in year t

BO_t = Realized Operational Expenditure in year t

BM_t = Realized Capital Expenditure in year t

$DPandemi_t$ = Pandemic Dummy Variable in year t

b_0 = Constant term / Intercept

b_1, b_2, b_3 = Regression coefficients

e_t = Error term

To ensure that the proposed regression equation yields unbiased estimators, the validity of the regression model must first be verified through a series of classical assumption tests. This procedure serves as a crucial instrument to guarantee that the OLS model satisfies the BLUE (Best Linear Unbiased Estimator) criteria, particularly in mitigating potential bias resulting from degree-of-freedom constraints in small sample sizes ($n = 13$). If the model is proven to be free from assumption violations, the analysis can proceed to the hypothesis testing stage by conducting partial significance testing (t-test), simultaneous significance testing (F-test), and coefficient of determination (R^2) analysis.

3. Research Results

This section presents the empirical findings in three stages. First, descriptive statistics are reported to provide an overview of the distribution and variability of the research variables. Second, the results of the classical assumption tests are presented to assess the suitability of the Ordinary Least Squares (OLS) regression model. Finally, the regression results are discussed to evaluate the

simultaneous and partial effects of operational expenditure, capital expenditure, and the COVID-19 pandemic on regional economic growth.

Descriptive Statistics

Descriptive statistical analysis provides an initial overview of the characteristics of the dataset before hypothesis testing is conducted. Table 1 summarizes the minimum, maximum, mean, and standard deviation values of the continuous research variables over the 13-year observation period from 2012 to 2024.

Table 1. Descriptive Statistics of Research Variables (in Billion IDR)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
GRDP Constant Prices (PDRB_ADHK)	13	117,035.58	143,009.77	126,468.79	7,326.64
Operational Expenditure (BO)	13	2,638.93	6,373.01	3,604.64	968.70
Capital Expenditure (BM)	13	1,026.37	5,987.22	3,180.86	1,932.84

Source: Processed SPSS Output Data (2025).

As presented in Table 1, Kutai Kartanegara recorded an average real GRDP of IDR 126.47 trillion, ranging between IDR 117.04 trillion and IDR 143.01 trillion. On the fiscal front, operational expenditure averaged IDR 3.60 trillion, surpassing average capital expenditure (IDR 3.18 trillion). Notably, capital expenditure exhibited significantly higher volatility (Std. Dev = IDR 1.93 trillion) compared to operational expenditure (Std. Dev = IDR 0.97 trillion), indicating that public infrastructure spending in Kutai Kartanegara suffered from substantial year-to-year budgetary fluctuations.

Before interpreting the regression coefficients, a series of classical assumption diagnostic tests was conducted to assess the adequacy of the model. Given the small sample size ($n = 13$), residual normality was evaluated using the Shapiro–Wilk test. The resulting p-value of 0.106, which exceeded the 0.05 significance level, indicated insufficient evidence to reject the assumption of normally distributed residuals. The multicollinearity assessment showed that all predictors had Variance Inflation Factor (VIF) values well below the threshold of 10, with a maximum VIF of 1.601, indicating no serious multicollinearity. Furthermore, visual inspection of the residual scatterplot revealed a random distribution around zero without a discernible pattern, suggesting homoscedastic residuals. Finally, the Durbin–Watson statistic of 1.186 fell within the practical range of 1.0–3.0, indicating no severe first-order autocorrelation. Overall, these diagnostic results suggest that the regression model does not exhibit serious violations of the classical OLS assumptions.

Empirical Model Estimation and Hypothesis Testing

Following the classical assumption diagnostics, the analysis proceeds to model estimation and hypothesis testing. As no serious violations of the OLS assumptions were detected, the estimated coefficients and inferential statistics can be interpreted with reasonable confidence. Model

evaluation was conducted sequentially using the coefficient of determination (R^2) to assess explanatory power, the simultaneous F-test to examine the joint effect of all independent variables, and partial t-tests to evaluate the individual effect of each predictor on regional economic growth. Table 2 first presents the model fit summary, indicating the proportion of variation in real GRDP explained by operational expenditure, capital expenditure, and the pandemic dummy variable.

Table 2. Model Fit Summary (Coefficient of Determination)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.835 ^a	0.698	0.597	4,649.52

Predictors: (Constant), Pandemic Dummy, BO_Billion, BM_Billion.

Source: Processed SPSS Output Data (2025).

Table 2 shows a strong multiple correlation coefficient ($R = 0.835$). The model achieves an R^2 of 0.698 and an Adjusted R^2 of 0.597. This demonstrates that 59.7% of the total variance in Kutai Kartanegara's real GRDP growth is jointly explained by operational expenditure, capital expenditure, and the COVID-19 pandemic shock, while the remaining 40.3% is governed by external factors (e.g., global commodity price cycles and private investments).

Table 3. ANOVA Significance Test (Simultaneous F-Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	449,594,033.0	3	149,864,677.7	6.932	0.010^b
Residual	194,562,215.0	9	21,618,023.8		
Total	644,156,248.0	12			

Dependent Variable: GRDP Constant Prices (PDRB_ADHK_Miliar); Predictors: (Constant), Pandemic Dummy, BO_Billion, BM_Billion.

Source: Processed SPSS Output Data (2025).

The F-test results in Table 3 produce an F-statistic of 6.932 with a p-value of 0.010 ($p < 0.05$). This confirms that the linear regression model as a whole is statistically significant and robust for empirical inference.

Table 4. Regression Coefficients and Partial t-Test Results

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std.Error			
(Constant)	108,783.692	6,122.430	—	17.768	< 0.001
Operational Expenditure (BO)	6.127	1.398	0.810	4.382	0.002

Capital Expenditure (BM)	-1.112	0.879	-0.293	-1.266	0.237
Pandemic Dummy (2020–2022)	-3,743.135	3,872.093	-0.224	-0.967	0.359

Dependent Variable: PDRB_ADHK_Miliar.

Source: Processed SPSS Output Data (2025).

Based on the econometric equation derived from Table 4, operational expenditure has a positive and statistically significant association with regional economic performance ($B = 6.127$; $p = 0.002$). Holding other variables constant, an increase of IDR 1 billion in operational expenditure is associated with an estimated IDR 6.127 billion increase in real GRDP. Its standardized beta coefficient of 0.810 indicates that operational expenditure has the strongest relative association with GRDP among the predictors included in the model. In contrast, capital expenditure has a negative but statistically insignificant coefficient ($B = -1.112$; $p = 0.237$), suggesting insufficient evidence of a contemporaneous linear relationship between capital expenditure and GRDP. The pandemic dummy also has a negative but statistically insignificant coefficient ($B = -3,743.135$; $p = 0.359$). Although this direction indicates that GRDP was estimated to be lower during the pandemic period, the result does not provide sufficient statistical evidence that the pandemic independently affected regional economic performance after controlling for government expenditure.

4. Discussion

The empirical finding that operational expenditure is the primary growth engine aligns directly with Keynesian macroeconomic theory. Operational expenditure in Kutai Kartanegara is dominated by civil servant salaries, administrative purchasing, and local goods/services procurement. These outlays possess high liquidity and immediately enter the local economic stream, stimulating household consumption, preserving local purchasing power, and driving high short-term multiplier effects. This outcome reinforces earlier empirical evidence by Fitri & Putri (2019) and Ayu et al. (2020), who concluded that routine public expenditures deliver immediate growth stimuli in Indonesian subnational economies.

In contrast, the failure of capital expenditure to achieve statistical significance in the contemporaneous model can be attributed to two major factors: severe multi-year time lags and investment volatility. As argued by Kermite et al. (2023) and Kartika (2024), major public infrastructure projects (e.g., roads, bridges, public facilities) require multi-year construction periods before producing measurable productivity gains. Furthermore, descriptive statistics revealed high volatility in capital expenditure realization (Std. Dev = IDR 1.93 trillion). As demonstrated by Museru et al. (2014), unpredictable public capital investment cycles degrade the multiplier efficiency of capital spending. These results align with Fitri & Putri (2019) but contrast with studies reporting immediate capital expenditure impacts (Nofriyanti & Silalahi, 2019; Aulia et al., 2024; Kirana & Susilo, 2024).

Finally, the statistical insignificance of the pandemic dummy suggests that Kutai Kartanegara's economy demonstrated notable resilience during the 2020–2022 crisis. Aggressive local fiscal intervention—specifically through budget refocusing and sustained operational expenditure—acted as a counter-cyclical stabilizer, effectively softening the macroeconomic shock of COVID-19 in accordance with Musgrave's public finance framework (Agustina & Wardoyo, 2024).

5. Conclusions

Based on the empirical analysis covering the 2012–2024 period, operational expenditure has a positive and statistically significant association with the real GRDP of Kutai Kartanegara Regency. It also has the largest standardized coefficient among the predictors, indicating its relatively prominent role in supporting regional economic activity. In contrast, capital expenditure does not exhibit a statistically significant contemporaneous relationship with real GRDP. This result does not necessarily imply that capital expenditure is ineffective, as its economic benefits may emerge over a longer period than that captured by the model. The pandemic dummy also has a negative but statistically insignificant coefficient, indicating insufficient evidence that the pandemic period independently altered real GRDP after government expenditure was controlled for. Overall, the findings highlight the importance of operational expenditure as a short-term fiscal instrument, while the contribution of capital expenditure requires further examination using a longer-term and lagged-effect framework.

The findings do not imply that the regional government should simply increase operational expenditure. Instead, the Government of Kutai Kartanegara should improve its composition and efficiency by prioritizing expenditures that directly support public services, infrastructure maintenance, local economic activities, and community purchasing power. Capital expenditure should remain an important fiscal priority, but its effectiveness requires stronger project selection, multiyear planning, timely procurement, implementation discipline, and outcome-based monitoring. Greater attention should also be given to reducing annual spending volatility and ensuring that infrastructure projects are completed on schedule and connected to regional economic priorities. These measures would help balance immediate fiscal stimulus with the development of productive capacity and sustainable long-term economic growth.

This study has several limitations. First, the analysis relies on only 13 annual observations from a single regency, which limits statistical power and the generalizability of the findings. Second, the contemporaneous OLS specification cannot capture the delayed effects of capital expenditure. Third, the pandemic dummy simplifies a complex crisis into a binary measure and therefore cannot distinguish the effects of mobility restrictions, fiscal refocusing, commodity-price fluctuations, and national economic recovery policies. Fourth, using real GRDP levels as a proxy for economic growth may expose the estimation to common time trends unless stationarity and cointegration are explicitly tested. The model may also be affected by omitted variables and reverse causality between government expenditure and regional output. Future research should employ longer panel datasets, growth rates or logarithmic transformations, lagged expenditure variables, and time-series techniques such as ARDL or error-correction models while incorporating private investment, population, regional revenue, and commodity-price dynamics.

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