

THE ASSOCIATION OF LOCAL OWN-SOURCE REVENUE GROWTH AND CAPITAL
EXPENDITURE GROWTH ON FISCAL STRESS

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ABSTRACT

Fiscal stress arises when a region's revenue is insufficient to cover its spending or to keep up public services. This study looks at the relationship between growth in local own-source revenue and growth in capital expenditure and fiscal stress in the provincial governments of Indonesia from 2021 to 2025. For the analysis, actual budget data from the Regional Financial Information System is used together with a fixed-effects panel model that includes both province and year effects, and robust standard errors are applied to the 178 observations. The results indicate that growth in local own-source revenue is linked to reduced fiscal stress, although this association is not statistically significant in the main model. In contrast, growth in capital expenditure is associated with higher fiscal stress and this connection is statistically significant. When both variables are considered together, however, their relationship is statistically significant. The sensitivity analysis reveals that when the regions related to Papua are excluded, growth in revenue becomes significantly linked to lower fiscal stress. The steady relationship between growth in capital expenditure and fiscal stress stays the same. These findings indicate that fiscal stress is determined by the extent to which revenue meets spending requirements. Furthermore, they lend support to the idea of combining efforts to improve revenue with medium-term planning of capital investments. The present study makes a contribution by employing a normalized measure of the gap between spending and revenue and by examining the robustness of the results with respect to changes in regional boundaries and different years.

KEYWORDS: local own-source revenue growth; capital expenditure growth; fiscal stress; provincial government; panel regression

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INTRODUCTION

Fiscal decentralization gives local governments the power to handle their revenues and expenditures in order to meet the needs relating to public services and development. It is necessary for local governments to keep a balance between their revenue-earning capacity and their expenditure requirements since imbalances can limit fiscal space and reduce their capacity to maintain public services (Oates, 1972). A situation that shows this kind of pressure is known as fiscal stress, which arises when the revenue-earning capacity and fiscal flexibility are not sufficient to meet expenditure needs, budgetary obligations, and the requirements for public services on a sustainable basis.

This concept includes deficits, pressure on expenditure, a falling revenue-earning capacity, and the restriction on governments' ability to respond to economic changes and societal demands (Arnett, 2011; Septira et al., 2019). The level of fiscal stress among the

provincial governments in Indonesia differs greatly. According to the data on realized regional budgets (APBD) for 2025, fiscal stress varied from 21.73% to 20.60%. Six provinces had positive values, meaning that their actual expenditures exceeded their revenues, while the remaining 32 provinces had negative values. The highest level was found in Papua at 20.60%, then came East Kalimantan at 8.94% and West Java at 3.25%. This variation shows the differences in the provinces' ability to maintain a fiscal balance even though they are operating under the same national policy framework (Directorate General of Fiscal Balance [DJPK], 2026).

An increase in local own-source revenue (PAD) and in capital expenditure is linked to the dynamics of fiscal stress. Growth in PAD shows changes in a local government's ability to generate its own-source revenue. Theoretically, an increase in PAD widens fiscal space and improves financing flexibility and thus has the potential to lessen fiscal pressure (Muda, 2012; Lhutfi et al., 2020; Syifa et al., 2021). On the other hand, higher capital expenditure increases the financing demands in the current year before the economic benefits are obtained. If this is not offset by sufficient revenue-earning capacity, fiscal pressure could rise (Shamsub & Akoto, 2004; Wildavsky, 1964). Earlier research findings have been inconsistent. Lhutfi et al. (2020) found that growth in PAD has a negative effect on fiscal stress, while growth in capital expenditure is not significant. Syifa et al. (2021) found that both variables have a negative effect, whereas Rupilu et al. (2023) reported results in the opposite direction. Gunara and Halim (2017) found that, among provincial governments, only growth in PAD is partially significant.

Apart from these discrepancies in the empirical results, previous studies have mainly focused on regency and city governments and have used different proxies for measuring fiscal stress (Arnett, 2011; Muda, 2012; Sun et al., 2026; Adriana et al., 2017). This study tackles the empirical, measurement, population, and contextual gaps by looking at the provincial governments in Indonesia from 2021 to 2025. Fiscal stress is measured as the difference between total expenditure and total revenue, with this difference being divided by total revenue, which allows for comparisons between provinces of different budget sizes. The study makes a contribution by applying this normalized measure of fiscal stress at the provincial level. It checks the reliability of the findings through sensitivity analyses that take into account changes in the composition of the Papua-related regions and the effects of the year. Accordingly, the study

Seeks to examine the partial and joint relationships between growth in PAD and growth in capital expenditure and fiscal stress in the provincial governments of Indonesia. On the basis of the theoretical considerations and previous empirical evidence, the following hypotheses are put forward: H1: growth in PAD is negatively related to fiscal stress; H2: growth in capital expenditure is positively related to fiscal stress; and H3: growth in PAD and growth in capital expenditure are jointly related to fiscal stress.

RESEARCH METHOD

This study makes use of an explanatory quantitative method and employs secondary panel data relating to the provincial governments and the various years in question. The data on realised PAD, capital expenditure, total revenue and total expenditure were acquired from the DJPK Regional Financial Information System Data Portal. The data for 2020 were used exclusively as the base year for calculating the growth in PAD and the growth in capital expenditure for 2021; accordingly, the estimation period stays the same, that is, from 2021 to 2025. The estimation period includes 38 provinces. Following

adjustments for the historical data availability in the case of provinces that were established as a result of the territorial expansion of Papua, the final dataset consists of an unbalanced panel with 178 observations. The sensitivity analysis that excludes the six regions related to Papua makes use of 160 observations from 32 provinces. Fiscal stress (FS) is measured by the ratio of the difference between total expenditure and total revenue to total revenue. Growth in PAD (PPAD) and growth in capital expenditure (PBM) are calculated as the percentage change in the realised values in the current year compared with those in the previous year.

When realised values are used, the variables show actual transactions and normalising fiscal stress enables fair comparisons to be made between provinces of different budget sizes. The analysis involves the preparation of descriptive statistics, the selection of a model, diagnostic checks, hypothesis testing and sensitivity analyses. The Chow and Hausman tests show that the Fixed Effects Model is the most appropriate one, this model including both province and year effects. The diagnostic tests look for problems of multicollinearity, heteroskedasticity and serial correlation. As the Durbin-Watson statistic is 1.699, indicating the possibility of serial correlation, robust standard errors are employed in the main model to obtain more reliable results. The study examines partial associations at the 5 per cent level of significance and makes use of the Wald test to assess the joint significance of PPAD and PBM. Sensitivity analyses are carried out by excluding the six Papua-related regions and by running the model without year effects.

Table 1. Operational Definition of Variables

Variable	Operational definition	Measurement	Scale
Fiscal stress (FS)	Normalized gap between realized total expenditure and total revenue	$FS_{it} = \frac{TotalExpenditure_{it} - TotalRevenue_{it}}{TotalRevenue_{it}} \times 100$	Ratio
PAD growth (PPAD)	Percentage change in realized PAD in the current year relative to the previous year.	$PPAD_{it} = \frac{PAD_{it} - PAD_{i,t-1}}{PAD_{i,t-1}} \times 100\%$	Ratio
Capital expenditure growth (PBM)	Percentage change in realized capital expenditure in the current year relative to the previous year.	$PBM_{it} = \frac{BM_{it} - BM_{i,t-1}}{BM_{i,t-1}} \times 100\%$	Ratio

Source: Processed by the author, 2026.

RESULT AND DISCUSSION

From a total of 178 observations, the fiscal stress (FS) has a mean of 0.580950 and varies from

The coordinates range from 26.24831 to 43.86519, showing a large variation in fiscal conditions among the provinces and over the different periods. The PPAD has a mean of 7.602209 per cent and a median of 9.276273 per cent, the values extending from -

66.91440 per cent to 309.4599 per cent; the highest value, which is much higher than both the mean and the median, suggests that there is an observation with extremely high PAD growth. The PBM has a mean of 0.869616 per cent and a median of -0.389721 per cent, the values varying from -75.86916 per cent to 139.4244 per cent, indicating significant year-on-year variation in the growth of capital expenditure.

Table 2. Descriptive Statistics (178 Observations)

Variable	Minimum	Maximum	Mean	Median	Std. deviation
FS	-26.24831	43.86519	-0.580950	-1.626047	8.259922
PPAD	-66.91440	309.4599	7.602209	9.276273	29.96434
PBM	-75.86916	139.4244	0.869616	-0.389721	40.10044

Source: EViews 14 output processed by the author, 2026.

Model Selection and Diagnostic Tests

For the selection of the model and the diagnostic tests, both the Chow and the Hausman tests indicate that the Fixed Effects Model should be used in the main analysis (with $p < 0.05$ and a Hausman probability of 0.0288). The tolerance values for PPAD and PBM are 0.963, and the VIF is 1.038, which means there is no multicollinearity. The Glejser test also shows that there is no heteroskedasticity. The initial regression yields a Durbin-Watson statistic of 1.699, indicating the possibility of serial correlation. Because of this, hypothesis testing employs the Fixed Effects Model together with robust standard errors in order to obtain more reliable results.

Hypothesis Testing

Table 3. Fixed-Effects Estimation with Robust Standard Errors

Variable	Coefficient	Robust SE	t-statistic	Probability	Decision
PPAD	-0.070861	0.041507	-1.707201	0.0962	Not supported
PBM	0.070054	0.024172	2.898148	0.0063	Supported

Source: EViews 14 output processed by the author, 2026.

PPAD has a coefficient of 0.070861 and a probability of 0.0962; even though the negative direction is in agreement with H1, the result is not statistically significant at the 5% level and therefore H1 is not supported by the main model. When the fixed effects are kept constant, a one-percentage-point increase in PPAD is associated with a 0.071-percentage-point decrease in fiscal stress, but this association is not statistically significant. PBM has a coefficient of 0.070054 and a probability of 0.0063, indicating a positive and statistically significant relationship, which in turn supports H2. With the fixed effects held constant, a one-percentage-point increase in PBM is linked to a 0.070-percentage-point increase in fiscal stress. The Wald test yields an F-statistic of 5.846439 and a probability of 0.0037, showing that both PPAD and PBM are jointly significant and thus supporting H3. Since the adjusted R-squared is 0.299021, PPAD, PBM, and the fixed effects together account for 29.90% of the variation in fiscal stress in the model.

Sensitivity Analysis

Table 4. Comparison of Main and Sensitivity Models

Model	PPAD coefficient (Probability)	PBM coefficient (Probability)	Wald test p- value
Main model	-0.070861 (0.0962)	0.070054 (0.0063)	0.0037
Without Papua areas	-0.193410 (0.0165)	0.063474 (0.0003)	0.0001
Without year effects	-0.051067 (0.2031)	0.075854 (0.0034)	0.0024

Source: EViews 14 output processed by the author, 2026.

When the six Papua-related regions are excluded from the model, PPAD becomes negative and statistically significant, while PBM remains positive and statistically significant. This indicates that the results for PPAD depend on which regions are included, especially the Papua-related ones. In the model without year effects, PPAD is still negative but not statistically significant, and PBM remains positive and statistically significant. The Wald test is significant in both sensitivity checks. This means that PPAD and PBM are jointly significant in all models, but the link between PPAD and fiscal stress is less stable than the link for PBM.

Discussion

The negative relationship between PPAD and fiscal stress is in agreement with Fiscal Decentralization Theory, which holds that a greater capacity to generate revenue should lead to more fiscal space and therefore reduce the gap between expenditure and revenue (Oates, 1972). Yet the fiscal stress indicator relies on total revenue rather than just PAD; changes in transfers and other types of revenue can counteract or exceed the effects of changes in PAD, and spending can also vary when revenue rises. This is why the coefficient is in line with the theory but is not statistically significant in the main model. The fact that Lhutfi et al. (2020) and Syifa et al. (2021) found negative effects, and Rupilu et al. (2023) found a positive effect, shows how important it is that different measures, government levels, time periods, and regional compositions are taken into account. The sensitivity analyses indicate that the link between PPAD and fiscal stress should be interpreted with care, since its significance disappears when the Papua-related regions are excluded. The positive relationship between PBM and fiscal stress is consistent across all the models. According to Public Budgeting Theory, when the budget is spent, investment has to be financed.

The economic, service, and revenue benefits of infrastructure tend to show up later (Wildavsky, 1964). The fact that the model does not take account of time lags means that the positive coefficient should be regarded as reflecting the short-term financing pressure resulting from the gap in timing between the costs and the benefits, not as evidence that capital spending is unproductive. This is in agreement with Shamsub and Akoto (2004), who associate fiscal stress with imbalances between revenue and spending. According to Stewardship Theory, local governments should make sure that the short-term financing pressure caused by public investment leads to actual services and economic benefits in the future (Donaldson & Davis, 1991). The Wald test indicates that both PPAD and PBM are jointly significant in the main model as well as in both of the sensitivity analyses.

This is in line with Fiscal Decentralization Theory and Public Finance Theory, which stress the need to match revenue capacity with spending responsibilities in order to

achieve fiscal sustainability (Oates, 1972; Musgrave & Musgrave, 1989). The fact that both variables are jointly significant means that they are statistically significant in the model, but it does not prove that they have separate causes. In practice, PAD should be optimised and capital spending managed together as part of a medium-term fiscal plan that links revenue targets, financing capacity, investment priorities and expected benefits.

This study only covers the period 2021 to 2025, uses a single measure of fiscal stress, does not include control variables or tools to deal with possible endogeneity, and measures capital spending as a whole without taking time lags into account. The panel is also unbalanced because of the territorial changes in Papua, and the significance of PPAD changes when the Papua-related regions are excluded. Therefore, the results should be seen as statistical associations within this sample and model and not as definite proof of causation. Also, the model does not show the long-term benefits of public investment.

CONCLUSION

In the main model, growth in PAD is linked to lower fiscal stress, but not in a statistically significant way. When the Papua-related regions are excluded, the PPAD coefficient becomes negative and statistically significant, so the relationship between PPAD and fiscal stress should be interpreted with care, taking into account regional differences. Growth in capital spending is positively and significantly linked to fiscal stress and this result remains consistent in all of the sensitivity checks. PPAD and PBM are also jointly significant in all of the models.

Overall, the findings show that fiscal stress among provincial governments is related to the balance between revenue capacity and spending needs, with stronger evidence in the case of PBM than for PPAD. The results are consistent with the fiscal decentralization framework, which looks at how revenue and spending responsibilities are matched. The positive association between growth in capital spending and fiscal stress also corresponds to the timing gap between the current investment costs and the benefits that will be received later. In practice, provincial governments should align improvements in PAD with projects.

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