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LOCAL GOVERNMENT FINANCIAL SUSTAINABILITY BEFORE, DURING, AND AFTER THE COVID-19 PANDEMIC

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ABSTRACT

This study to analyze how the COVID-19 pandemic affected the fiscal sustainability of Indonesian provincial governments by comparing conditions before, during, and after the crisis. Using a quantitative approach, the analysis draws on secondary data from regional budget (APBD) reports covering 34 provinces from 2018–2024. Fiscal sustainability is assessed through two revenue-based indicators namely regional revenue effectiveness and fiscal independence. Normality tests guided the choice of methods, with ANOVA applied to normally distributed data and the Kruskal–Wallis test used when distributions were non-normal. Results show a significant decline in regional revenue effectiveness after the pandemic compared with both the pre- and mid-pandemic periods, while fiscal independence also varied across the three phases. Post-hoc analysis indicates that the most pronounced differences occurred between the post-pandemic period and the earlier phases, highlighting the long-term fiscal pressure created by the pandemic and the slow pace of revenue recovery. These findings underscore the need for strategies to broaden local tax bases and strengthen compliance, ensuring more resilient provincial finances and reducing dependence on central transfers when facing future shocks.

Key words: financial sustainability; revenue; COVID-19 pandemic; fiscal independence

i. INTRODUCTION

The COVID-19 pandemic created profound economic and humanitarian disruptions, producing far-reaching operational and financial consequences for local governments worldwide (Maher et al., 2020). The fiscal sustainability of subnational governments came under severe pressure, prompting the adoption of adaptive strategies across many countries. Bisogno et al. (2017) note that numerous local governments faced mounting financial stress due to rising debt, widening deficits, and declining revenues.

Economic and financial crises heighten the demand for stronger fiscal sustainability in public finance (Boulivar et al., 2016). These pressures have been compounded by austerity measures and growing concerns over the long-term viability of public services (Ferry & Murphy, 2017). The relevance of financial sustainability intensifies whenever a nation encounters national or global economic shocks (Koop & Korobilis, 2014; Yazici et al., 2015), as was evident during the COVID-19 crisis (Alfonso, 2021).

Financial sustainability in local governments is generally understood as the ability to meet both short- and long-term financial obligations while maintaining the quality and scope of public services without imposing an undue fiscal burden on future generations (Wójtowicz & Hodžić, 2021; Limoa & Weku, 2024). The concept extends beyond a simple balance of revenues and expenditures to include the capacity to adapt to changing economic, political, and demographic conditions (Afonso & Jalles, 2015). Local governments that can maintain financial sustainability are considered fiscally healthy (Rahayu et al., 2023).

Revenue pressures and rising expenditures caused by the pandemic were not unique to Indonesia. In the United Kingdom, local governments faced large fiscal deficits, forcing drastic budget adjustments (Murphie, 2023). In China, fiscal stress reduced corporate investment in environmental protection, indicating weakened local capacity to support sustainable development (Liu & Ren, 2023). Across the United States, an analysis of 150 cities revealed significant tax-revenue declines from the economic slowdown, prompting service cutbacks and the postponement of infrastructure projects, as well as sharp increases in operating deficits (Chernick et al., 2020). Local governments there were often compelled to rely on state assistance to sustain essential services.

In Indonesia, strategies such as budget refocusing and fiscal transfers from the central government helped stabilize regional budgets. The pandemic depressed national revenues while simultaneously increasing spending needs, leaving local governments constrained by reduced transfers and limited alternative financing options. Budget analyses show that provinces dependent on central transfers struggled to implement fiscal policies, whereas regions with strong own-source revenues were hit hard by declining economic activity that narrowed their fiscal space (Desdiani et al., 2022). At the governance level, the crisis also accelerated innovations in performance management and public accountability, requiring local institutions to be more adaptive and responsive to fiscal uncertainty.

This pattern illustrates that fiscal shocks from COVID-19 were global, but their magnitude depended heavily on each government's fiscal structure and degree of funding autonomy. In Indonesia, budget-refocusing policies mandated by Minister of Home Affairs Regulation No. 20/2020 and central government transfers became key instruments for maintaining fiscal stability during the crisis. These measures enabled rapid budget reallocation to health and social-protection sectors while deferring or reducing non-priority capital expenditures. However, such strategies also carry long-term risks, including diminished local fiscal capacity for future development financing.

The pandemic compelled local governments to make significant adjustments in public financial management. Capital spending declined as budgets were redirected toward health programs and social assistance as part of a swift crisis response. Permanasari et al. (2021) highlight that Indonesian local governments employed various financing strategies, including budget refocusing and reallocation, to preserve fiscal sustainability and ensure the continuity of public services.

Although research on the fiscal effects of COVID-19 on local governments has grown rapidly since 2020, important gaps remain. Most studies concentrate on the pandemic period itself, emphasizing revenue losses, expenditure shifts, and short-term mitigation efforts. Comprehensive analyses comparing the pre-pandemic, intra-pandemic, and post-pandemic periods are still scarce, particularly in developing-country contexts.

This study seeks to address that gap by comparing the financial sustainability of Indonesian local governments before, during, and after the COVID-19 pandemic. It focuses on revenue-side indicators of financial sustainability to provide a more complete understanding of how local fiscal capacity evolved across these three critical phases.

ii. METHOD

This research uses a quantitative approach by utilizing secondary data sourced from the Regional Revenue and Expenditure Budget (APBD) reports and the budget realization of local governments in Indonesia. The analyzed data cover the period from 2018 to 2024, enabling a depiction of the dynamics of local government fiscal sustainability before, during, and after the COVID-19 pandemic. The research subjects include 34 provincial governments in Indonesia, so the scope of analysis can represent the financial conditions of regions at the national level.

The initial stage of the research focuses on testing the distribution of data through normality tests. Two statistical methods are applied the Kolmogorov-Smirnov and the Shapiro-Wilk tests, taking into account the characteristics of the data and the sample size. The results of the normality test form the basis for determining the next analytical method. If the data are normally distributed, hypothesis testing is carried out using analysis of variance (ANOVA). Conversely, if the data are not normally distributed, the non-parametric Kruskal-Wallis test is used, which is more suitable for data with a non-normal distribution.

The hypothesis testing is designed to assess whether there are differences in the financial sustainability of local governments in three main periods namely before, during, and after the COVID-19 pandemic. The researcher uses a revenue perspective. Financial sustainability is measured by two variables namely regional revenue effectiveness and regional financial independence. Regional revenue effectiveness is defined as the ability of a region to realize revenue targets compared with its actual potential and is measured through the ratio of realized revenue to the budgeted target. The second variable is regional financial independence, which reflects the extent to which a region can finance public expenditure from its own financial sources without excessive dependence on central government transfers, measured through the ratio of Regional Original Revenue (Pendapatan Asli Daerah, PAD) to total regional revenue.

If the hypothesis testing results show a significant difference, this research continues with further analysis using a post hoc test. For data that meet parametric assumptions, the Tukey HSD test is used, while for non-parametric data the Dunn’s test can be applied. This post hoc test serves to identify specifically which period pairs show significant differences, for example between the pre-pandemic and post-pandemic periods, or between the pandemic period and the other periods. Thus, the analysis does not stop at a general conclusion about the existence of differences, but also explains in detail where those differences occur.

With this research design, it is expected to obtain a more comprehensive picture of the fiscal sustainability of local governments in Indonesia. The approach of comparing three time periods at once provides added value compared with previous research which generally only focused on two periods (pre- and during the pandemic). In addition, the use of a revenue perspective through the variables of revenue effectiveness and fiscal independence provides a clear operational basis. Revenue effectiveness is measured by comparing the realization of regional revenue with the revenue target set in the APBD. Fiscal independence is calculated through the ratio of Regional Original Revenue (PAD) to total regional revenue. These two variables are chosen because they can directly reflect the ability of local governments to tap real potential and reduce dependence on transfers from the central government.

The revenue effectiveness of local governments refers to the ability of a region to realize the revenue targets set in the budget. Regional revenue effectiveness reflects the extent to which the local government can realize the planned revenue, particularly from Regional Original Revenue (PAD) sources. A high effectiveness ratio indicates strong collection capacity and strengthens the long-term fiscal base. During the COVID-19 pandemic, many regions experienced a decline in effectiveness due to the slowdown in economic activity, tax relaxation policies, and limited fiscal space. Recent studies emphasize that the resilience of local budgets in Indonesia is strongly determined by the effectiveness of PAD revenue and fiscal independence, where regions with stronger PAD capacity are better able to maintain fiscal sustainability despite pandemic pressures (Zein et al., 2022).

Financial sustainability refers to the government's ability to finance public expenditure consistently from stable and predictable fiscal resources, without excessive dependence on external sources, which can also be seen from the ratio of regional financial independence (Afonso & Jalles, 2015). A higher level of fiscal independence is often associated with greater flexibility in responding to local economic dynamics and resilience to external shocks such as crises or pandemics. Conversely, low fiscal independence indicates a long-term risk to fiscal sustainability because the region becomes highly dependent on central transfers and vulnerable to changes in national policy. Studies in Indonesia show that provinces with high PAD were relatively more able to maintain fiscal space and implement policy maneuvers during the pandemic, while regions highly dependent on transfers faced significant revenue shortages (Zein et al., 2023; Makhya et al., 2023).

The research model is presented in Figure 1.

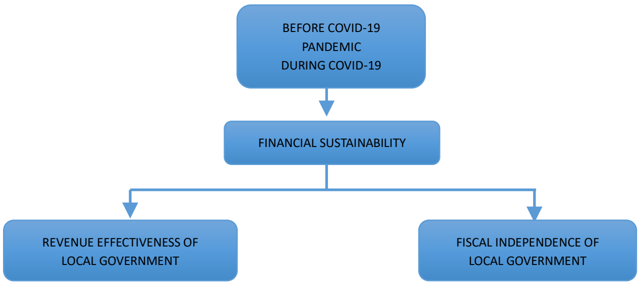

Figure 1. Research Model

Based on the research model, the following hypotheses are formulated:

H1: There is a difference in financial sustainability before, during, and after the COVID-19 pandemic as measured by the indicator of revenue effectiveness.

H2: There is a difference in financial sustainability before, during, and after the COVID-19 pandemic as measured by the indicator of regional financial independence.

iii. RESULTS AND DISCUSSION

Before testing the main hypotheses, the initial step was to examine the data distribution to determine whether the research data followed a normal distribution. This normality test is essential because it dictates the type of difference test to be applied in the subsequent analysis that is ANOVA for normally distributed data and the Kruskal–Wallis test for non-normal data.

Normality was assessed using two common statistical approaches (Kolmogorov–Smirnov and Shapiro–Wilk) which are both widely employed to evaluate data distribution across relatively large and small sample sizes. The normality test results for the regional revenue-effectiveness indicator are presented in Table 1.

Table 1. Results of Normality Test for Regional Revenue Effectiveness

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Before_Covid19 Pandemic	0.142	68	0.002	0.844	68	0.000

During_Covid19 Pandemic	0.098	68	0.173	0.933	68	0.001
After_Covid19 Pandemic	0.119	68	0.018	0.948	68	0.006

Based on the normality test results for the regional revenue-effectiveness indicator, the Kolmogorov–Smirnov and Shapiro–Wilk significance values were mostly below the 0.05 threshold across the pre-pandemic, pandemic, and post-pandemic periods. This indicates that the revenue-effectiveness data are not normally distributed. Consequently, hypothesis testing for this indicator cannot rely on a parametric approach and must instead use the non-parametric Kruskal–Wallis method to ensure that the analysis remains valid and consistent with the data's distributional characteristics.The normality test results for the regional financial-independence indicator are presented in Table 2**.**

Table 2. Results of Normality Test for Regional Financial Independence

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Before_ Covid 19 Pandemic	0.085	68	.200*	0.976	68	0.21
During_Covid 19 Pandemic	0.091	68	.200*	0.977	68	0.255
After_Covid 19 Pandemic	0.083	68	.200*	0.974	68	0.158

The normality tests for the regional financial independence indicator showed Kolmogorov–Smirnov and Shapiro–Wilk significance levels consistently above 0.05 for all periods (before, during, and after the COVID-19 pandemic). These results confirm that the data are normally distributed. Consequently, the assumption of normality is met, and hypothesis testing for this indicator can be conducted using a parametric approach, specifically ANOVA.

The hypothesis testing is therefore conducted in line with the normality test outcomes and is presented separately for each hypothesis in the following sections.

Regional Revenue Effectiveness

The first hypothesis was tested using the Kruskal–Wallis method. The results of this non-parametric test are presented in Table 3.

Table 3. Results of Hypothesis Testing for Regional Revenue Effectiveness (Kruskal–Wallis Test)

	Effetiveness
Kruskal-Wallis H	14.489
df	2
Asymp. Sig.	0.001

Based on the Kruskal–Wallis test, the results show H = 14.489 with 2 degrees of freedom (df = 2) and a significance level of Asymp. Sig = 0.001. Because the significance value is below 0.05, there is a statistically significant difference in local government financial sustainability—measured by the regional revenue effectiveness indicator—across the pre-, during-, and post-pandemic periods of COVID-19. Thus, the research hypothesis stating that revenue effectiveness differs among the three periods is accepted. This finding indicates that the dynamics of the COVID-19 pandemic produced a tangible shift in local governments' ability to realize revenue targets relative to their actual potential.

Having established through the Kruskal–Wallis test that significant differences exist in revenue effectiveness before, during, and after the pandemic, a follow-up analysis is required to identify specifically which time-period pairs differ. Because the data are not normally distributed, the appropriate post-hoc procedure is Dunn's test with Bonferroni correction. This test pinpoints the period pairs (before–during, before–after, and during–after) that differ significantly, providing a clearer picture of how regional revenue effectiveness changed throughout the pandemic period, as summarized in Table 4.

Table 4. Dunn's Test

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
After-During	31.23	10.779	2.897	.004	0.011
After-Before	43.125	11.807	3.652	.000	0.001
During-Before	11.895	10.779	1.104	.270	0.809

The Dunn's post-hoc test shows significant differences in regional revenue effectiveness between the post-pandemic (After) and during-pandemic (During) periods (Adj. Sig. = 0.011) and between the post-pandemic and pre-pandemic (Before) periods (Adj. Sig. = 0.001). No significant difference is observed between the during-pandemic and pre-pandemic periods (Adj. Sig. = 0.809). These findings indicate that the most pronounced change in revenue effectiveness occurs in the post-pandemic phase.

The Kruskal–Wallis analysis confirms significant differences in revenue effectiveness across the three periods—before, during, and after COVID-19. The Dunn's test clarifies that these differences are concentrated between the pre- and post-pandemic periods, as well as between the during- and post-pandemic periods, while the difference between the pre- and during-pandemic periods is not statistically significant. This pattern suggests that the pandemic created long-term pressure on local revenue effectiveness, and post-pandemic recovery has not yet returned to pre-pandemic levels.

These results align with studies showing that the COVID-19 pandemic sharply reduced local fiscal capacity by decreasing own-source revenues, particularly local taxes and fees that depend on economic activity. At the same time, regional spending increased for health and social assistance, reducing attention to revenue optimization. The significant differences between the post-pandemic period and the two earlier periods also point to fiscal restructuring. Although some provinces have begun to recover their own-source revenues, effectiveness remains below pre-pandemic levels due to continuing tax-relief and incentive policies that limit the revenue base.

This research confirms that Indonesia's local revenue effectiveness declined markedly after the pandemic compared with the pre-pandemic period, while differences between the pre- and during-pandemic periods were insignificant. The finding is consistent with other Indonesian studies reporting that the pandemic strained regional fiscal capacity, lowering own-source revenue (PAD) and increasing dependence on central transfers.

International evidence shows a similar pattern, in Europe the pandemic deepened fiscal imbalances, with many local governments experiencing sharp drops in tax and fee revenues during economic contraction. Germany, for example, faced budget deficits and rising debt ratios during COVID-19 (Gebhardt & Siemers, 2020). Indonesia's local government slower rebound, reflecting differences in fiscal capacity, economic structure, and adaptive strategies. As Lonta et al. (2025) note, the impact of monetary shocks depends heavily on a country's financial stability. Regions with strong economic bases and innovative fiscal policies tend to restore revenue effectiveness more quickly, whereas areas heavily dependent on central transfers recover more slowly. Indonesia's significant post-pandemic decline underscores the need for long-term strategies to broaden the local tax base and strengthen compliance to safeguard fiscal sustainability.

Local Fiscal Independence

The hypothesis test results for financial sustainability, using the local fiscal independence indicator before, during, and after the COVID-19 pandemic, are presented in Table 3.5.

Table 3.5. Hypothesis Test Results for Local Fiscal Independence

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.328.710	2	1.164.355	4.564	0.01
Within Groups	59.949.914	235	255.106		

Total	62.278.624	237

The hypothesis test using ANOVA indicates that there are significant differences in regional revenue effectiveness across the periods before, during, and after the COVID-19 pandemic. The F-value of 4.564 with a significance level of 0.011 (<0.05) demonstrates that revenue effectiveness differs significantly among the three periods. These findings confirm that the COVID-19 pandemic and the subsequent post-pandemic conditions had distinct impacts on the ability of local governments to achieve their revenue targets. Consequently, this result provides a strong rationale for conducting post-hoc tests to identify which specific period pairs exhibit significant differences in revenue effectiveness. The results of the post-hoc analysis using Tukey's HSD are presented in Table 3.6.

Table 3.6. Tukey HSD Post-Hoc Test Results

(I) Group			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Before_Covid19 Pandemic	During_Covid19 Pandemic	-225.201	250.052	0.64	-81.499	36.459
		After_Covid19 Pandemic	-7.96059*	273.918	0.01	-144.214	-14.998
	During_Covid19 Pandemic	Before_Covid19 Pandemic	225.201	250.052	0.64	-36.459	81.499
		After_Covid19 Pandemic	-570.858	250.052	0.06	-116.065	0.1893
	After_Covid19 Pandemic	Before_Covid19 Pandemic	7.96059*	273.918	0.01	14.998	144.214
		During_Covid19 Pandemic	570.858	250.052	0.06	-0.1893	116.065

The post-hoc Tukey HSD test on the regional revenue effectiveness indicator revealed a significant difference between the pre-pandemic period (Before) and the post-pandemic period (After), with a p-value of 0.011 (<0.05). This indicates that revenue effectiveness after the pandemic differed significantly and tended to be lower than before the pandemic. In contrast, the comparison between the pre-pandemic (Before) and during-pandemic (During) periods yielded a significance value of 0.640 (>0.05), while the comparison between during-pandemic (During) and post-pandemic (After) resulted in 0.060 (>0.05), neither of which were statistically significant. These results suggest that the most substantial change in regional revenue effectiveness occurred between the pre- and post-pandemic periods, whereas differences between the pre- and during-pandemic or during- and post-pandemic periods were not statistically strong.

Higher fiscal independence is often associated with greater fiscal flexibility, enabling local governments to respond to local economic dynamics and withstand external shocks such as economic crises or pandemics. Conversely, low fiscal independence may indicate long-term risks to fiscal sustainability, as regions become highly dependent on central government transfers or national economic fluctuations. Studies in Indonesia show that regional financial independence positively and significantly affects fiscal sustainability (Rohmadani et al., 2024), and that revenue effectiveness and efficiency influence PAD growth (Marsudi et al., 2023). Even during the pandemic, some regions were able to achieve PAD targets effectively, despite limited fiscal independence (Nugraeni et al., 2022).

These findings are consistent with international research demonstrating that the COVID-19 pandemic reduced local revenue effectiveness. Local governments in Europe experienced a higher impact on revenue than on expenditure, with subnational governments facing significant revenue contractions that disrupted fiscal capacity (OECD, 2020). Similarly, Chernick et al. (2020) found that the pandemic created large gaps between revenue targets and actual collection, particularly from local tax sources.

However, these results contrast with studies indicating that certain regions were able to quickly adjust fiscal strategies, preventing drastic declines in fiscal independence. Local governments can maintain fiscal resilience through revenue diversification strategies and adaptive policies. This suggests that variations in regional revenue effectiveness are strongly determined by institutional capacity, economic base, and fiscal policy implementation. The current study underscores that post-pandemic recovery of regional revenue continues to face structural obstacles.

The trend of increasing financial independence post-pandemic is positive, as observed in provinces such as Bali, DKI Jakarta, and West Java, though some regions have yet to recover. Wicaksana & Azhar (2025) recommend that the Indonesian government develop policies for allocating contingency budgets according to region-specific disaster risks, thereby strengthening local financial preparedness and minimizing disruptions to financial sustainability.

To enhance fiscal sustainability, local governments in Indonesia need to optimize strategies for increasing Own-Source Revenue (PAD) through tax intensification and extensification, improving taxpayer compliance, and innovating non-tax revenue streams. While some local governments have shown signs of fiscal recovery in terms of post-pandemic independence, this trend has not yet occurred uniformly across all provinces. Revenue effectiveness remains below pre-pandemic levels, highlighting the need for sustained fiscal strengthening strategies.

iv. CONCLUSION

The COVID-19 pandemic has not only disrupted the effectiveness of local government revenue during the crisis but has also left lasting structural effects on post-pandemic revenue patterns. In response, local governments are encouraged to develop innovative strategies to strengthen revenue performance, such as digitalizing tax collection processes and diversifying local revenue sources (PAD). These measures are crucial to building a more resilient financial framework capable of withstanding future crises.

This study finds clear evidence of significant differences in the financial sustainability of Indonesian local governments before, during, and after the COVID-19 pandemic, particularly regarding revenue effectiveness and financial independence. Revenue effectiveness experienced a sharp decline during the pandemic and has yet to return to pre-pandemic levels, suggesting that the pre-pandemic period still represents the most favorable conditions. On the other hand, financial independence remained relatively stable before and during the pandemic due to heavy reliance on central government transfers but improved significantly in the post-pandemic period, especially in regions with a strong economic base. Post-hoc analyses highlight that the most pronounced differences occur between the pre-pandemic and post-pandemic periods, affecting both effectiveness and independence indicators. These findings resonate with international studies showing that while the pandemic hindered local fiscal performance, recovery in financial independence is possible when local revenue bases are sufficiently robust. Collectively, this points to structural challenges in optimizing local revenue and underscores the necessity of strengthening fiscal institutions.

Based on these insights, several recommendations emerge. First, local governments should enhance revenue effectiveness by improving tax and levy collection systems through digitalization and data-driven oversight. This approach ensures that revenue targets are realistic and minimizes potential leakage. Second, the post-pandemic gains in financial independence should be sustained by diversifying revenue sources and reducing dependency on central government transfers, allowing local governments to better navigate economic uncertainty. Finally, both central and local governments should collaborate to strengthen fiscal capacity across regions through human resource development, adaptive fiscal policies, and equitable economic opportunities. Such measures help ensure that improvements in financial sustainability extend beyond economically strong regions to also benefit less-developed areas.

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