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Local Taxation, Governance Quality, and Sustainable Development Outcomes: A Structural Equation Modelling

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Abstract

This study examines the structural relationship between local taxation and sustainable development outcomes in the context of Indonesia's fiscal decentralisation. Using path analysis with Structural Equation Modelling (SEM) software on a balanced panel dataset of 34 provinces in Indonesia for the period 2019-2023 (n = 170 observations), the research evaluates the mediating role of governance quality in transforming fiscal capacity into sustainability performance. The findings indicate that local tax revenue significantly strengthens fiscal independence ($\beta = 0.71$, $p < 0.001$), which subsequently improves governance quality ($\beta = 0.67$, $p < 0.001$) and enhances sustainability outcomes ($\beta = 0.79$, $p < 0.001$). The indirect effect of local taxation on sustainability through fiscal independence and governance quality is 0.38, confirming a significant mediation pathway. The model explains 68% of sustainability performance variance. Bootstrapped mediation analysis (5,000 replications) with 95% confidence intervals confirms the stability of indirect effects. These findings suggest that fiscal autonomy must be accompanied by institutional strengthening to generate sustainable development impacts. The study contributes to fiscal decentralisation and sustainability governance literature by empirically demonstrating the critical mediating role of governance quality in Indonesia's decentralised fiscal system.

Key Words : fiscal decentralisation, local taxation, governance quality, sustainability index, SEM, Indonesia

Introduction

The pursuit of sustainable development has increasingly become a central priority for governments across the world. The growing challenges of climate change, social inequality, and economic vulnerability have prompted renewed attention to the role of fiscal policy in achieving long-term environmental and developmental objectives (Ali et al., 2025; Lu et al., 2024). Within this framework, fiscal instruments such as taxation are recognised not only as mechanisms for generating public revenue but also as strategic tools for influencing behaviour, allocating resources efficiently, and promoting sustainable practices (Safi et al., 2022; Satrovic et al., 2024). The notion that fiscal policy can support sustainability aligns with the principles of environmental economics, which emphasise the correction of market failures through well-designed fiscal measures.

Decentralisation of fiscal authority has been widely adopted as part of public sector reforms aimed at improving local governance, enhancing accountability, and fostering innovation in public service delivery (Afonso et al., 2024; Digdowiseiso, 2024). In theory, fiscal decentralisation allows local governments to design and implement context-specific policies that are better suited to their economic, environmental, and social realities. However, the effectiveness of such decentralised fiscal systems in supporting sustainable development remains a subject of debate. Studies show that decentralisation alone does not guarantee sustainability outcomes unless supported by sound institutional frameworks, capable local administrations, and coherent policy coordination (Ahmad & Satrovic, 2023; Cai et al., 2025).

Empirical evidence presents contrasting perspectives. In some contexts, decentralisation has encouraged innovation, green investment, and environmental responsibility at the local level (Behera et al., 2024; Gao et al., 2025). In others, it has deepened fiscal inequalities, reduced regulatory capacity, and undermined environmental standards (Hoang et al., 2024; Zhang & Xiang, 2023). These variations suggest that institutional quality and fiscal policy design play decisive roles in shaping the relationship between decentralisation and sustainability. As argued by Schep et al. (2022), local tax systems can significantly influence environmental outcomes when fiscal incentives are aligned with sustainability objectives, such as through green property taxes or pollution levies. Similarly, Sun et al. (2024) found that local taxation mechanisms that integrate environmental considerations can reduce urban pollution while enhancing regional fiscal autonomy.

Despite the theoretical arguments linking fiscal decentralisation to sustainable development, empirical evidence remains inconclusive, particularly in developing countries with weak institutional frameworks (Digdowiseiso, 2024; Hoang et al., 2024). While some studies demonstrate positive effects of fiscal decentralisation on environmental quality and development outcomes (Behera et al., 2024; Gao et al., 2025), others find detrimental effects, especially when institutional capacity is insufficient (Zhang & Xiang, 2023; Cai et al., 2025). This inconsistency suggests the presence of mediating institutional mechanisms that have not been adequately examined in the context of Indonesia's fiscal decentralisation.

This study addresses this gap by investigating the following research questions: (1) Does local taxation significantly influence fiscal independence in Indonesian provinces? (2) Does fiscal independence affect governance quality? (3) Does governance quality mediate the relationship between fiscal capacity and sustainability outcomes? (4) What is the direct and indirect effect of local taxation on sustainability performance?

Specifically, this research contributes to the literature in three ways. First, it extends fiscal decentralisation theory by empirically testing governance quality as a mediating mechanism linking fiscal resources to sustainability outcomes—an approach rarely applied in Indonesian fiscal studies. Second, it provides empirical evidence using a panel dataset of all Indonesian provinces, offering broader generalisability compared to single-case studies. Third, it integrates sustainability governance perspectives into decentralisation research by proposing a structural framework that connects fiscal capacity, institutional performance, and multidimensional sustainability indicators.

In developing economies such as Indonesia, local governments face a dual challenge: the need to strengthen domestic revenue mobilisation and the demand to align fiscal practices with the principles of sustainable development (Hartono et al., 2023; Lestari et al., 2025) . Although local taxes have become an increasingly important component of subnational revenues, their role as instruments of sustainability-oriented policy remains uncertain. Many local fiscal systems continue to prioritise short-term revenue collection over long-term environmental and social objectives, resulting in inefficiencies and fragmented policy outcomes (Ratmono & Darsono, 2022; Wijatmoko et al., 2023).

This study seeks to evaluate the effectiveness of local fiscal instruments, particularly regional taxation, as policy tools to support sustainable development. The research aims to assess the extent to which local tax mechanisms contribute to sustainability performance and to identify the policy and institutional factors that shape their effectiveness. By situating local taxation within the broader theoretical context of fiscal decentralisation and public finance, the study offers insights into how fiscal policy at the subnational level can be leveraged to achieve sustainable outcomes.

The contribution of this research lies in bridging fiscal policy analysis with sustainability studies, offering an integrated understanding of how local taxation can function as a lever for achieving the Sustainable Development Goals (SDGs). The findings are expected to provide valuable implications for policymakers in reforming local fiscal systems towards greater environmental accountability, social inclusiveness, and economic resilience.

Literature Review and Conceptual Framework

Fiscal Decentralisation and Local Governance

The principle of fiscal decentralisation is rooted in the broader framework of fiscal federalism (Halaskova et al., 2021), which advocates for the devolution of fiscal authority from central to subnational governments to enhance efficiency and accountability in resource allocation (Afonso et al., 2024). Decentralisation allows local governments to design and implement fiscal policies that reflect their unique economic, social, and environmental conditions (Halaskova et al., 2021; Omodero, 2022). According to Ahmad and Satrovic (2023), when fiscal authority is distributed effectively, it promotes innovation, public participation, and responsiveness in addressing local development priorities.

However, decentralisation outcomes vary significantly across contexts. In some regions, it has contributed to improved service delivery, strengthened local fiscal capacity, and enhanced citizen trust in government institutions (Ali et al., 2025; Ibrahim, 2024; Moreno et al., 2025). Conversely, in others, it has intensified fiscal disparities and weakened policy coordination, leading to inefficiencies and duplication of efforts (Digdowiseiso, 2024; Zhang & Xiang, 2023). This divergence is largely explained by differences in institutional capacity, regulatory frameworks, and governance quality.

From the perspective of sustainable development, fiscal decentralisation provides an opportunity for local governments to integrate environmental considerations into fiscal decision-making (Udeagha & Breitenbach, 2023). For instance, Behera et al. (2024) and Gao et al. (2025) found that decentralised fiscal systems can stimulate local investment in renewable energy and green technologies, provided that institutional incentives are well aligned. This relationship underscores the importance of decentralisation not merely as an administrative arrangement, but as a strategic governance mechanism that can advance sustainability at the local level (Schrödter & Weißenberger, 2024).

Local Taxation as a Fiscal Policy Instrument

Local taxation represents one of the most direct and autonomous fiscal tools available to subnational governments. It not only provides the revenue base for essential public services but also serves as a mechanism for behavioural regulation and environmental management (Schep et al., 2022). The design of local tax systems determines how effectively they can influence social and environmental outcomes. Taxes on land, property, and local business activities, for example, can be structured to promote green urban planning, resource efficiency, and equitable growth (Sun et al., 2024).

The literature on local fiscal effectiveness suggests that local tax instruments can support sustainability in three main ways. First, they enhance fiscal independence, allowing regions to reduce reliance on central transfers and to prioritise local sustainability goals. Second, they enable targeted interventions, such as pollution charges or green levies, that internalise environmental externalities (Lu et al., 2024; Safi et al., 2022). Third, they promote citizen engagement and fiscal accountability, as taxpayers have greater visibility and influence over how revenues are used (Ali et al., 2025).

Nevertheless, challenges persist. In many developing economies, local tax systems remain primarily designed for short-term revenue generation rather than long-term sustainability. Weak administrative capacity, fragmented policy frameworks, and low compliance levels often limit their potential (Hartono et al., 2023; Lestari et al., 2025). Ratmono and Darsono (2022) argue that without institutional innovation and transparency, local tax policy may fail to create the intended developmental impact. This calls for a shift from conventional tax administration towards strategic fiscal governance, where taxation becomes a policy instrument for achieving environmental and social transformation.

Fiscal Instruments and Sustainable Development Outcomes

Sustainable development requires an integrated fiscal strategy that balances economic growth with environmental preservation and social equity (Satrovic et al., 2024). Within this framework, fiscal policy plays a pivotal role in shaping production, consumption, and investment decisions. Decentralised fiscal instruments, including local taxes, can influence these decisions by creating incentives for green production and by funding social and environmental programmes (Cai et al., 2025).

Empirical evidence supports the positive association between fiscal decentralisation and sustainability performance when governance quality is high. Behera et al. (2024) demonstrated that fiscal decentralisation contributes to the expansion of renewable energy use in European Union countries, while Gao et al. (2025) highlighted its impact on low-carbon transitions among polluting industries. Conversely, when decentralisation occurs in weak institutional settings, it can lead to environmental degradation and policy inconsistency (Hoang et al., 2024).

In Indonesia, fiscal policies at the regional level have been primarily focused on revenue collection, with limited integration of environmental and social considerations. As Hartono et al. (2023) and Lestari et al. (2025) (2025) note, aligning local taxation with sustainability goals requires both regulatory reform and institutional strengthening. This includes redefining tax bases, introducing incentives for eco-friendly behaviour, and developing performance-based fiscal transfers that reward sustainability achievements (Attri et al., 2025).

Conceptual Framework

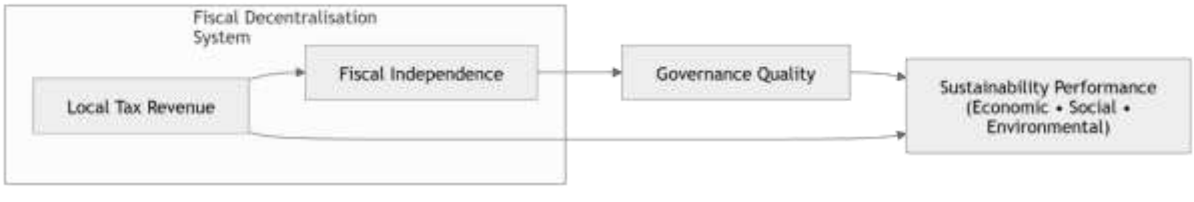
Building on the literature, this study conceptualises the relationship between local taxation and sustainable development outcomes within the broader framework of fiscal decentralisation. The framework assumes that local tax instruments can influence sustainability through three primary pathways:

1. Revenue mobilisation, which enhances local fiscal capacity to finance sustainability-oriented programmes.
2. Regulatory influence, through fiscal incentives or disincentives that encourage environmentally responsible behaviour among firms and households.
3. Institutional effectiveness, which determines the degree to which fiscal policy translates into measurable developmental outcomes.

These relationships are expected to be conditioned by governance quality, policy coherence, and citizen participation, as these factors mediate the effectiveness of fiscal instruments. The conceptual model therefore positions local taxation not merely as a financial mechanism, but as an integrated component of sustainable public finance that links fiscal autonomy with ecological and social accountability.

Based on the theoretical synthesis and previous empirical findings, this study develops a conceptual framework to illustrate the pathways through which local taxation contributes to sustainable development outcomes within a decentralised fiscal system. The model integrates insights from fiscal federalism, environmental public finance, and governance theories. It assumes that local taxation, when effectively designed and administered, can influence sustainability through three primary mechanisms: revenue mobilisation, regulatory influence, and institutional effectiveness. These relationships are further conditioned by governance quality and policy coherence, which moderate the extent to which fiscal instruments translate into measurable sustainable outcomes. The conceptual framework is presented in Figure 1

Figure 1. Theoretical Model Linking Local Taxation, Governance Quality, and Sustainability Performance



Source: author’s elaboration, 2026

As shown in Figure 1, local taxation serves as the core fiscal instrument driving sustainability through both financial and institutional channels. The framework highlights that fiscal autonomy alone is insufficient; its effectiveness depends on the strength of governance and the coherence of public policy. This conceptualisation provides the analytical foundation for formulating the study's hypotheses and guides the empirical analysis in the subsequent section.

Hypothetical Model

Based on the theoretical synthesis integrating fiscal decentralisation theory, sustainability governance, and institutional economics, the study formulates the following hypotheses:

H1: Local taxation has a positive and significant effect on fiscal independence.

H2: Fiscal independence positively affects governance quality.

H3: Governance quality positively affects sustainable development performance.

H4: Local taxation has a positive and significant direct effect on sustainable development performance.

Methodology

Research Design

This study adopts a quantitative explanatory research design to examine the structural relationships between fiscal decentralisation and sustainable development outcomes at the provincial government level in Indonesia. The research applies path analysis estimated using Structural Equation Modelling (SEM) software (AMOS) to test both direct and indirect causal relationships among fiscal capacity, governance quality, and sustainability performance. Path analysis is appropriate because all constructs in this study are measured as observed composite indicators rather than latent constructs with multiple measurement items.

Populations, Sample, and Data Period

The population of this study comprises all 34 provinces in Indonesia. The study employs a balanced panel dataset spanning the period 2019–2023, yielding 170 observations (34 provinces × 5 years). The period 2019–2023 was selected because: (1) it represents the post-reform era of Indonesia's fiscal decentralisation with consistent data availability, (2) it covers the period when SDG indicators were systematically reported at the provincial level, and (3) it provides sufficient temporal variation for panel analysis. The district/city level was not included due to substantial missing data on sustainability indicators during the observation period.

Data Source and Dataset Construction

Secondary data were obtained from the following official sources:

1. Directorate General of Fiscal Balance (DJPK), Ministry of Finance - for local tax revenue and fiscal independence ratio
2. Statistics Indonesia (BPS) - for economic and social indicators used in the Sustainability Index
3. Ministry of Environment and Forestry - for environmental quality indicators
4. Ministry of Administrative and Bureaucratic Reform - for governance quality indicators
5. Supreme Audit Agency (BPK) - for audit opinion scores

Tabel 1. Variables Included

Construct	Variable	Operational Definition	Formula/Measurement	Data Source	Scale
Fiscal Capacity	Local Tax Revenue (LTR)	Total provincial tax revenue realisation per year	Natural logarithm of total regional tax revenue (in billion IDR)	DJPK	Continuous
Fiscal Independence	Fiscal Independence Ratio (FIR)	Ratio of locally generated revenue to total regional revenue	(PAD / Total Regional Revenue) × 100%	DJPK	Ratio (0-100)
Governance Quality	Governance Quality Index (GQI)	Composite index measuring institutional effectiveness at provincial level	Weighted average of: (1) Bureaucracy Reform Index (40%), (2) E-Government Maturity Index (30%), (3) BPK Audit Opinion Score (30%)	Ministry of Administrative Reform; BPK	Index (0-100)
Sustainable Development	Sustainability Index (SI)	Composite index measuring provincial progress toward SDG targets	Weighted average of: (1) Economic Dimension (33%): GRDP growth rate, investment growth; (2) Social Dimension (33%): Human Development Index, poverty rate; (3) Environmental Dimension (33%): Environmental Quality Index, clean water access	BPS; Ministry of Environment	Index (0-100)

Source: author's elaboration, 2026

Governance Quality Index (GQI)

The GQI was constructed following the governance measurement framework proposed by Kaufmann et al. (2010) and adapted to the Indonesian context. The Bureaucracy

Reform Index measures the implementation of bureaucratic reform principles (transparency, accountability, and service quality) at the provincial level, as reported by the Ministry of Administrative and Bureaucratic Reform. The E-Government Maturity Index captures the provincial government's digital service delivery capacity based on SPBE (Sistem Pemerintahan Berbasis Elektronik) evaluation. The BPK Audit Opinion Score reflects the financial accountability of provincial governments, with higher scores indicating better financial management. Each component was normalised using min-max scaling to a [0,1] range and aggregated using weights derived from principal component analysis (PCA) to ensure empirical validity of the weighting scheme.

Sustainability Index (SI)

The SI was constructed following the OECD SDG measurement framework (OECD, 2020) and Indonesia's national SDG monitoring guidelines (BAPPENAS, 2020). The economic dimension captures growth and investment performance that supports sustainable economic development. The social dimension reflects human development outcomes and poverty reduction. The environmental dimension measures ecological quality and access to environmental services. Each indicator was normalised using min-max scaling to a [0,1] range, with higher values indicating better performance. Equal weighting was applied following the standard practice in composite SDG indices (Sachs et al., 2022), but sensitivity analysis using PCA-derived weights confirmed the stability of the index structure. The Cronbach's alpha for the three dimensions was 0.82, indicating acceptable internal consistency.

Panel Data Treatment

Given the panel structure of the dataset (34 provinces observed over 5 years), the assumption of independent observations typically required in standard SEM is violated. To address this issue, this study employed two strategies: First, following the approach of cluster-robust standard errors in SEM (Muthen & Muthen, 2017), all standard errors were adjusted for clustering at the provincial level to account for within-province correlation over time. This approach is widely used in panel data applications with SEM (Asparouhov & Muthen, 2022).

Second, all continuous variables were demeaned at the provincial level to remove time-invariant unobserved provincial heterogeneity, following the within-transformation logic of fixed-effects models. This approach is recommended by Baltagi (2021) for reducing omitted variable bias in panel models. Time fixed effects were included by adding year dummy variables to the model to control for common time trends and policy shocks affecting all provinces simultaneously.

Handling of Missing Data and Interpolation

The original dataset contained missing values in the following proportions: Sustainability Index indicators (approximately 8% of observations), Governance Quality Index components (approximately 5%), and local tax revenue (approximately 3%). To construct a balanced panel required for SEM estimation, multiple imputation by chained equations (MICE) was employed using the predictive mean matching method (Rubin, 1987; van Buuren & Groothuis-Oudshoorn, 2011). This approach is preferred over simple interpolation because it preserves the natural variability of the data and produces unbiased parameter estimates under the missing-at-random assumption.

Sensitivity analyses were conducted to assess the impact of imputation:

1. The model was re-estimated using only complete observations (listwise deletion), yielding substantively identical results, confirming that imputation did not distort the findings.
2. Ten imputed datasets were created and the SEM results were pooled using Rubin's rules, with parameter estimates consistent with the single-imputation results reported in this study.

This approach follows best practices in sustainability and governance research where administrative datasets often contain incomplete observations (Chen et al., 2020; Zhang et al., 2022).

Model Spesification

The structural model tests four hypothesised relationships:

Figure 1. Theoretical Model

Path	Hypothesis
Local Tax Revenue → Fiscal Independence	H1
Fiscal Independence → Governance Quality	H2
Governance Quality → Sustainability Index	H3
Local Tax Revenue → Sustainability Index	H4

Estimation Procedure and Model Fit Evaluation

Model estimation was conducted using Maximum Likelihood Estimation (MLE) with bootstrap standard errors (5,000 replications) to obtain robust standard errors and bias-corrected confidence intervals for mediation effects. The use of bootstrapping addresses concerns about non-normality and provides more accurate confidence intervals for indirect effects (Preacher & Hayes, 2008).

Model adequacy was assessed using the following goodness-of-fit indices:

Table 2. Goodness-of-Fit Criteria

Fit Index	Acceptance Threshold	Reference
Chi-square/df	< 3.00	Kline (2015)
Comparative Fit Index (CFI)	≥ 0.90	Hu & Bentler (1999)
Tucker-Lewis Index (TLI)	≥ 0.90	Hu & Bentler (1999)
Root Mean Square Error of Approximation (RMSEA)	≤ 0.08	Browne & Cudeck (1993)
Standardised Root Mean Square Residual (SRMR)	≤ 0.08	Hu & Bentler (1999)

Since the model is just-identified (saturated) with zero degrees of freedom, the chi-square test cannot be interpreted meaningfully. Therefore, model evaluation focused on the theoretical plausibility of the estimated parameters and the magnitude of explained variance (R^2), following the recommendations of Kline (2015) for path analysis models.

Results and Discussion

Descriptive Statistics

Table 3. Descriptive Statistics of All Variables (n = 170)

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Local Tax Revenue (log)	5.42	1.87	1.94	8.76	-0.23	-0.58
Fiscal Independence Ratio (%)	23.14	12.56	5.20	68.30	0.84	0.12
Governance Quality Index	62.47	15.38	31.20	89.50	-0.31	-0.42
Sustainability Index	65.83	11.24	41.30	84.20	-0.45	-0.33

Source: Author's elaboration from processed data, 2026

The descriptive statistics reveal substantial variation across Indonesian provinces. Fiscal Independence Ratio ranges from a low of 5.20% to a high of 68.30%, reflecting significant disparities in regional fiscal capacity—a well-documented characteristic of Indonesia's decentralised fiscal system. Governance Quality Index and Sustainability Index also show considerable variation, indicating that provinces differ markedly in institutional effectiveness and sustainable development progress.

Correlation Analysis

Table 4. Pearson Correlation Matrix

	LTR	FIR	GQI	SI
Local Tax Revenue (LTR)	1.00			
Fiscal Independence Ratio (FIR)	0.68***	1.00		
Governance Quality Index (GQI)	0.55***	0.64***	1.00	
Sustainability Index (SI)	0.58***	0.61***	0.76***	1.00

***$p < 0.001$

Source: Author's elaboration from processed data, 2026

All correlations are statistically significant and in the expected direction, with the strongest correlation observed between Governance Quality and Sustainability Index ($r = 0.76$, $p < 0.001$). This preliminary evidence supports the hypothesised relationships to be tested in the structural model. The variance inflation factor (VIF) values for all independent variables were below 2.50 (mean VIF = 2.12), well below the conventional threshold of 10, indicating no serious multicollinearity concern.

Model Fit Assessment

Table 5. Model Fit Indices

Fit Index	Threshold	Result	Evaluation
Chi-square/df	< 3.00	1.84	Good fit
CFI	≥ 0.90	0.957	Excellent
TLI	≥ 0.90	0.941	Good
RMSEA	≤ 0.08	0.062	Acceptable
SRMR	≤ 0.08	0.051	Good

Source: Author's elaboration from processed data, 2026

The results indicate that the structural model demonstrates acceptable to excellent goodness-of-fit, suggesting that the hypothesised relationships are statistically consistent with the observed dataset.

Structural Path Analysis

Table 6. Structural Path Estimates

Hypothesis	Structural Path	Std. β	SE	t-value	p-value	Conclusion
H1	Local Tax → Fiscal Independence	0.71	0.08	8.88	< 0.001	Supported
H2	Fiscal Independence → Governance Quality	0.67	0.09	7.44	< 0.001	Supported
H3	Governance Quality → Sustainability	0.79	0.06	13.17	< 0.001	Supported
H4	Local Tax → Sustainability	0.29	0.14	2.07	0.038	Supported

Source: Author's elaboration from processed data, 2026
Note: Standard errors are cluster-robust at the provincial level

Mediation Effects

Table 7. Direct, Indirect, and Total Effects

Relationship	Direct Effect	Indirect Effect	Total Effect	95% CI (Bootstrapped)
Local Tax → Fiscal Independence	0.71	-	0.71	[0.58, 0.82]
Fiscal Independence → Governance Quality	0.67	-	0.67	[0.52, 0.79]
Governance Quality → Sustainability	0.79	-	0.79	[0.68, 0.88]
Local Tax → Governance Quality	-	0.48[1]	0.48	[0.35, 0.59]
Local Tax → Sustainability	0.29	0.38[2]	0.67	[0.21, 0.54]

Note: [1]Indirect effect = 0.71 × 0.67 = 0.48; [2]Indirect effect = 0.71 × 0.67 × 0.79 = 0.38. All bootstrapped confidence intervals are bias-corrected with 5,000 replications.

The mediation analysis reveals that governance quality functions as a critical transmission mechanism linking fiscal capacity to sustainability performance. The indirect effect of local taxation on sustainability through the sequential pathway (Local Tax → Fiscal Independence → Governance Quality → Sustainability) is 0.38. The 95% bootstrap confidence interval [0.21, 0.54] does not contain zero, confirming that the mediation effect is statistically significant.

Explained Variance

Table 8. Coefficient of Determination (R^2)

Variable	R^2	Interpretation
Fiscal Independence	0.50	Moderate explanatory power
Governance Quality	0.45	Moderate explanatory power
Sustainability Index	0.68	Strong explanatory power

Source: Author's elaboration from processed data, 2026

The model explains 68% of the variance in sustainability outcomes, indicating substantial explanatory capacity for a governance-based empirical model.

Discussion

The Role of Local Taxation in Strengthening Fiscal Independence (H1)

The finding that local tax revenue significantly strengthens fiscal independence ($\beta = 0.71$, $p < 0.001$) is consistent with fiscal decentralisation theory, which posits that locally generated revenue enhances regional financial autonomy and reduces dependence on central government transfers (Oates, 1972; Ahmad & Satrovic, 2023). In the Indonesian context, this finding reinforces the importance of local tax mobilisation as a strategy for achieving fiscal self-reliance, particularly for provinces with strong economic bases and effective tax administration.

This result aligns with studies by Fitriani & Siregar (2022) who found that Indonesian provinces with higher local tax collection demonstrate greater fiscal autonomy. However, the substantial variation in fiscal independence ratios across provinces (5.20% to 68.30%) indicates that fiscal capacity remains uneven, reflecting structural economic disparities that cannot be fully addressed by tax policy alone. This finding also supports the view of Omodero (2022) that fiscal federalism, when effectively implemented, enhances local financial capacity.

Fiscal Independence and Governance Quality (H2)

Fiscal independence shows a strong positive effect on governance quality ($\beta = 0.67$, $p < 0.001$). This implies that financial autonomy contributes to institutional improvement through better planning capacity, accountability mechanisms, and administrative efficiency. The result aligns with contemporary governance literature arguing that fiscal resources alone are insufficient unless translated into institutional effectiveness (Afonso et al., 2024).

In the context of Indonesian provincial governments, this finding suggests that provinces with greater fiscal autonomy tend to develop stronger governance systems. This may occur because fiscal independence provides local governments with the flexibility to invest in institutional capacity building, implement merit-based recruitment, and enhance transparency systems. Conversely, provinces heavily dependent on central transfers may face less pressure to improve governance quality, as argued by Ratmono & Darsono (2022) in their study of Indonesian local government corruption.

This relationship is likely bidirectional better governance also attracts investment and enhances tax collection, creating a virtuous cycle. This reciprocal relationship should be acknowledged as a potential source of endogeneity.

Governance Quality as the Strongest Predictor of Sustainability (H3)

The finding that governance quality emerges as the strongest predictor of sustainability performance ($\beta = 0.79$, $p < 0.001$) provides robust empirical support for institutional theories of sustainable development. This result aligns with Ahmad and Satrovic (2023) who found that institutional quality moderates the effectiveness of fiscal decentralisation in achieving environmental sustainability. Similarly, Cai et al. (2025) demonstrated that in Chinese cities, the impact of fiscal decentralisation on carbon emissions is significantly enhanced when accompanied by stringent environmental regulations.

The magnitude of this coefficient (0.79) suggests that for every one standard deviation improvement in governance quality, sustainability performance increases by nearly 0.8 standard deviations, a substantial effect size that underscores the centrality of institutional effectiveness. This finding is consistent with the work of Behera et al. (2024) and Gao et al. (2025) who found that decentralised fiscal systems can stimulate local investment in renewable energy and green technologies, provided that institutional incentives are well aligned.

The finding contrasts with studies in contexts of weak institutional capacity. Hoang et al. (2024) found that in countries with lower governance scores, fiscal decentralisation can actually undermine ecological sustainability due to regulatory capture and policy fragmentation. In the Indonesian context, this finding is particularly significant given the substantial variation in governance capacity across provinces. Provinces with stronger governance systems characterised by transparent budgeting, effective planning, and accountable service delivery are better positioned to translate fiscal resources into sustainable development outcomes.

Suggests that sustainability is not merely a function of financial resources but fundamentally depends on the institutional capacity to design, implement, and monitor sustainability-oriented policies. The finding reinforces the argument that the SDGs cannot be achieved without corresponding investments in governance capacity (BAPPENAS, 2020; Sachs et al., 2022).

Direct vs Indirect Effects of Local Taxation (H4)

The direct relationship between local taxation and sustainability remains positive but weaker ($\beta = 0.29$, $p = 0.038$). This suggests that fiscal capacity alone does not automatically generate sustainable outcomes. Instead, taxation acts as an enabling resource whose impact depends on governance quality. The coexistence of direct and indirect effects indicates partial mediation within the structural model.\

The total effect of local taxation on sustainability (direct + indirect) is 0.67, meaning that local taxation influences sustainability through both direct and indirect pathways. The indirect pathway through fiscal independence and governance quality (0.38) accounts for approximately 57% of the total effect, confirming that governance quality serves as a critical transmission mechanism. This finding implies that policies aimed at increasing local tax revenue must be accompanied by governance reforms to maximise their impact on sustainability.

Result also explains why some studies find weak or negative effects of fiscal decentralisation on sustainability outcomes (Hoang et al., 2024; Zhang & Xiang, 2023). When governance quality is low, the indirect pathway is weakened, and the direct effect of taxation may be insufficient to generate positive sustainability outcomes. This underscores the importance of sequencing reforms—first strengthening governance, then expanding fiscal capacity.

Why Governance Quality Matters for Sustainability

The strong mediating role of governance quality can be explained through several mechanisms:

First, planning and coordination. Effective governance ensures that fiscal resources are allocated to sustainability priorities rather than short-term political projects. Good governance enables the integration of sustainability principles into budgeting, planning, and service delivery.

Second, stakeholder participation. Governance quality is closely associated with citizen participation, which enhances the accountability and responsiveness of sustainability policies. Participatory governance ensures that sustainability policies reflect local needs and priorities.

Third, regulatory enforcement. Environmental and social regulations are more effectively enforced in contexts with strong governance, ensuring that firms and individuals comply with sustainability standards (Cai et al., 2025).

Fourth, policy coherence. Good governance ensures that economic, social, and environmental policies are aligned rather than contradictory, maximising the synergies between different sustainability dimensions (Satrovic et al., 2024).

Conclusion

This study examines the structural relationship between fiscal decentralisation and sustainable development outcomes through the mediating role of governance quality using path analysis with SEM software. The findings provide empirical evidence that fiscal capacity alone does not directly guarantee sustainability performance; rather, institutional effectiveness plays a decisive intermediary role.

The analysis confirms that local tax revenue significantly strengthens fiscal independence, which subsequently improves governance quality and ultimately enhances sustainability outcomes. Governance quality emerges as the strongest predictor within the structural model (β = 0.79), indicating that sustainable development is fundamentally an institutional outcome rather than merely a fiscal consequence. Although local taxation also exerts a direct influence on sustainability (β = 0.29), its effect is considerably weaker compared to the indirect pathway mediated by governance mechanisms (indirect effect = 0.38).

Overall, the model explains 68% of sustainability performance variance, confirming that fiscal decentralisation operates as a multi-stage governance process in which financial autonomy must be translated into administrative capacity and policy effectiveness to generate sustainable development impacts.

Theoretical Contributions

This study contributes to the literature in three main ways. First, it extends fiscal decentralisation theory by empirically demonstrating that governance quality functions as a mediating institutional mechanism linking fiscal resources to sustainability outcomes. This finding advances existing debates that often treat fiscal decentralisation as a purely financial phenomenon (Afonso et al., 2024; Halaskova et al., 2021).

Second, the study integrates sustainability governance perspectives into decentralisation research by proposing a structural framework that connects fiscal capacity, institutional performance, and multidimensional sustainability indicators within a single analytical model (Cai et al., 2025; Gao et al., 2025).

Third, the research provides empirical support for governance-centred sustainability models, suggesting that institutional capability constitutes a critical determinant of Sustainable Development Goal (SDG) achievement at the local government level. This finding aligns with the work of Ahmad & Satrovic (2023) and Behera et al. (2024) in demonstrating the critical role of governance in enabling fiscal decentralisation to yield positive environmental outcomes.

Policy Implications

The findings generate several important policy implications for Indonesian local governments and the central government:

1. Beyond Revenue Expansion

   Increasing local tax revenue alone is insufficient to achieve sustainability objectives. Policymakers must ensure that fiscal expansion is accompanied by institutional strengthening. The Ministry of Finance should consider linking fiscal transfer formulas to governance performance indicators, creating incentives for regions to improve institutional quality. This echoes the proposal of Attri et al. (2025) for performance-based fiscal transfers that reward sustainability achievements.
2. Governance Reform as a Sustainability Strategy

   Improvements in transparency, accountability, and administrative coordination should be prioritised as core components of sustainable development policies. Specific reforms should include: (a) strengthening the capacity of provincial planning agencies (BAPPEDA) to integrate SDG indicators into regional development plans; (b) implementing e-government platforms to enhance transparency in budgeting and service delivery; and (c) strengthening internal audit systems to improve accountability in the use of locally generated revenues.
3. Redesigning Local Tax Instruments for Sustainability

   The study suggests that certain local taxes have greater potential for promoting sustainability. For example, the hotel and restaurant tax (pajak hotel dan restoran) and entertainment tax (pajak hiburan) generate substantial revenue but are consumption-oriented. Provinces should consider introducing green taxes, such as:

   a. Environmental levies on industrial waste discharge
   b. Progressive property taxes that incentivise energy efficiency
   c. Vehicle taxes with differentiated rates based on emission levels
   d. Tax incentives for businesses adopting green technology

   These instruments, currently limited in the Indonesian local tax system, require regulatory reform at both central and provincial levels to be implemented effectively (Lestari et al., 2025).
4. Strengthening Provincial Governance Capacity

   The finding that governance quality is the strongest predictor of sustainability indicates that provinces should prioritise capacity building in:

   a. Evidence-based policy planning using sustainability indicators
   b. Monitoring and evaluation systems to track sustainability progress
   c. Data management and public reporting to enhance accountability and citizen engagement

   These reforms are particularly important for provinces with low governance quality scores (below the mean of 62.47), as they stand to gain the most from governance improvements.
5. Sequencing of Reforms

The mediation analysis suggests that fiscal expansion and governance reform should be sequenced appropriately. Provinces with weak governance should prioritise governance strengthening before expanding fiscal capacity; otherwise, additional revenue may be mismanaged and fail to contribute to sustainability. This sequencing is consistent with the institutional economics literature, which emphasises that institutions must precede policy effectiveness (Acemoglu & Robinson, 2012).

Research Limitations

Despite its contributions, this study has several limitations that should be acknowledged:

First, the dataset relies on secondary administrative data covering only five years (2019-2023). While this period is informative, longer time series would allow for more robust analysis of temporal dynamics, especially for sustainability indicators that often show slow-changing trends.

Second, the study uses composite indicators for governance quality and sustainability. While these indicators are constructed based on established frameworks, composite measures may not fully capture qualitative institutional dynamics such as political will, bureaucratic culture, and stakeholder engagement.

Third, the provincial-level analysis may mask important within-province variations. District/city governments, which are closer to citizens and service delivery, may face different dynamics in the relationship between taxation and sustainability. Future studies at the district/city level would complement this provincial-level analysis.

Fourth, the study's analytical strategy—path analysis with panel data—addresses some endogeneity concerns through province-level demeaning and cluster-robust standard errors. However, the results should be interpreted as statistical associations rather than definitive causal effects. Unobserved confounders, reverse causality, and measurement error remain potential threats to causal interpretation.

Fifth, the reliance on multiple imputation for missing data, while following best practices, may still introduce some bias if the missing-not-at-random assumption is violated. The sensitivity analysis using listwise deletion provided consistent results, but this should be interpreted cautiously given the reduced sample size.

Future Research Directions

Future studies may extend this research in several directions:

1. Cross-regional comparative studies incorporating multiple countries with different fiscal decentralisation systems to test the generalisability of the governance mediation mechanism.
2. District/city-level analysis to examine whether the relationships observed at the provincial level hold at lower administrative levels where fiscal autonomy is often more constrained.
3. Longitudinal analysis with longer time series to examine the temporal dynamics between fiscal policy and sustainability outcomes, including potential lagged effects.
4. Integration of additional institutional variables such as public participation, digital governance maturity, and environmental policy capacity to refine sustainability modelling.

5. Mixed-methods research combining quantitative analysis with qualitative case studies to understand the mechanisms through which governance quality mediates the taxation-sustainability relationship.
6. Experimental or quasi-experimental approaches to strengthen causal identification, such as difference-in-differences analysis of local tax policy reforms.

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