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Perceived Audit-Related Oversight as an Intervening Mechanism between Fiscal-Economic Conditions and Regional Development: Evidence from North Sumatra

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ABSTRACT

Background: Public-sector audits are expected to strengthen accountability and fiscal management, but their relationship with regional development remains unclear, particularly when audit intensity is positioned as an intervening construct. This study examines whether perceived audit intensity mediates the associations between fiscal-economic conditions and regional development in North Sumatra, Indonesia. **Methods:** A cross-sectional survey was conducted among 539 officials purposively selected from 26 provincial, district, and municipal government entities. Data were collected using an 81-item five-point Likert questionnaire and analysed using partial least squares structural equation modelling. Specific indirect effects were assessed using the delta method. **Results:** Economic growth was positively associated with regional development ($\beta = 0.709$, $p < 0.001$). Economic growth ($\beta = 0.280$, $p = 0.001$), local revenue ($\beta = 0.294$, $p < 0.001$), investment ($\beta = 0.134$, $p = 0.036$), and accountability and effectiveness ($\beta = 0.562$, $p < 0.001$) were positively associated with perceived audit intensity. Conversely, perceived audit intensity was negatively associated with regional development ($\beta = -0.261$, $p = 0.008$). Significant negative indirect associations were observed for economic growth, local revenue, and accountability and effectiveness, but not for investment. The model explained 71.4% of the variance in regional development. **Conclusion:** Perceived audit intensity did not constitute a positive pathway between fiscal-economic conditions and regional development. Its developmental value may depend on whether audit findings are translated into corrective action and integrated into planning and budgeting. Given the cross-sectional design, purposive sampling, and perceptual measures, the indirect effects represent concurrent statistical associations rather than causal mediation.

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1. INTRODUCTION

Fiscal decentralisation assumes that devolving authority and resources will improve infrastructure, services and welfare. Indonesia has tested this premise across more than five hundred district and municipal governments funded by local revenue and central transfers [1]. Nevertheless, convergence remains uneven: transfers and local revenue can support growth [2], spatial convergence is conditional [3], and expenditure composition determines whether decentralisation benefits the poor [4]. The central issue is therefore why fiscal inputs do not consistently produce development outcomes.

Comparative evidence attributes this gap less to resource volume than to government quality. Public spending and territorial investment generate stronger returns where institutions can convert budgets into delivery [5], [6]. Endogenous growth theory likewise predicts gains from productive expenditure but losses from distortionary financing and administrative waste [7], while persistent regional disadvantage reflects limited institutional capacity to absorb transferred resources [8].

External audit is a principal mechanism for strengthening that capacity. Supreme audit institutions verify accounts, assess compliance, and monitor recommendations [9], [10]. In Indonesia, the Audit Board audits every subnational financial statement annually. Higher audit probability has reduced missing expenditure in village projects [11], effective audit institutions correlate with stronger government performance [12], and audit intensity has improved some local fiscal outcomes [13].

Evidence is less conclusive for development delivery. Performance auditing can generate accountability gains but also unintended organisational consequences [14]. Compliance burden is associated with lower organisational performance [15], while bureaucratic rules impose cognitive and emotional costs on officials [16] and may produce unintended distributional effects [17]. Whether external audit supports or constrains subnational development therefore remains unresolved.

Two gaps sustain this uncertainty. First, audit is usually modelled as an outcome or direct determinant, including studies of local audit opinions and disclosure quality [18], rather than as an intervening construct between fiscal-economic conditions and development. Second, the term audit often combines analytically distinct experiences, producing inconsistent findings across studies.

This study therefore distinguishes five constructs: audit intensity (frequency, volume and depth of scrutiny), audit quality (competence, independence and technical soundness), audit burden (administrative, cognitive and temporal costs), audit follow-up (implementation of findings), and audit effectiveness (resulting governance or service improvements). These distinctions draw on audit-quality and administrative-burden research [19–21] and are summarised in Table 1. The study measures perceived audit-related oversight rather than objective audit volume, quality, burden or follow-up; compliance burden is treated only as a candidate mechanism for future testing.

Table 1. Conceptual distinctions among audit-related constructs

Construct	Conceptual referent	Typical operational indicators	Status in this study
Audit intensity	Frequency, volume and depth of external examination to which an audited entity is exposed	Number of engagements; number of findings and queries; scope and duration of fieldwork; perceived extent of scrutiny	Measured perceptually (Section 2.5)
Audit quality	Competence, independence and technical soundness with which the examination is performed	Auditor expertise and tenure; adherence to auditing standards; peer-review or inspection outcomes	Not measured
Audit burden	Administrative, cognitive and temporal cost that the examination imposes on the auditee	Staff time diverted to audit response; documentation volume; job-centred red-tape measures	Not measured; candidate mechanism only
Audit follow-up	Extent to which audit findings and recommendations are subsequently implemented	Proportion of recommendations settled; time to settlement; incidence of repeat findings	Not measured; recommended for future work
Audit effectiveness	Improvement in governance, financial management or service delivery attributable to the audit process	Change in audit opinion; reduction in repeat findings; movement in service and development indicators	Treated as outcome domain, not as audit measure

The study addresses three gaps: audit is rarely positioned between fiscal-economic conditions and development outcomes; adjacent audit constructs are frequently conflated; and evidence from lower-middle-income subnational settings remains limited. It estimates whether, and with what sign, perceived audit-related oversight intervenes in the relationships of economic growth, local revenue, investment, and accountability and effectiveness with regional development. Its contribution is to test this intervening role, clarify the audit constructs, and compare mediation patterns within a single audit jurisdiction that retains substantial fiscal and developmental heterogeneity.

Nine hypotheses are tested. H1–H4 predict positive associations of economic growth, local revenue, investment, and accountability and effectiveness with perceived audit-related oversight. H5–H8 predict positive associations of the same antecedents with regional development. H9 predicts an association between perceived audit-related oversight and regional development, enabling assessment of the four specific indirect pathways shown in Figure 1.

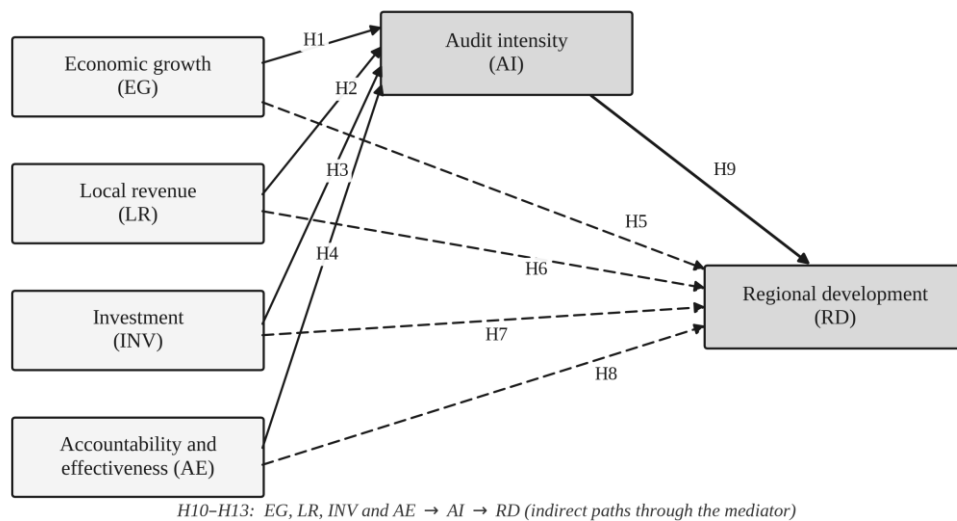


Figure 1. Hypothesised structural model

2. METHOD

2.1. Research design

An explanatory cross-sectional survey estimated theoretically specified associations among latent constructs. Because all constructs were measured at one time, the analysis supports statistical decomposition of concurrent associations but cannot establish temporal precedence or causal mediation [22].

2.2. Research location and time

North Sumatra comprises 33 districts and municipalities with metropolitan, industrial, agrarian, and island contexts. This heterogeneity provides variation in fiscal capacity, economic structure, and development within one audit jurisdiction, supported by published audit, planning, financial, and development records.

Fieldwork began in October 2024 and covered instrument development and clearance, primary and secondary data collection, and subsequent data cleaning, quality assessment, and model estimation.

2.3. Population, sample and sampling technique

The population comprised North Sumatran government entities receiving regional funding and subject to external audit. Purposive selection required three consecutive unqualified audit opinions, positive economic growth, and a high or improving human development index. The final frame contained 25 district and municipal governments plus the provincial government (26 entities). Because it favours comparatively high-performing entities, inference is conditional on this frame and is not representative of all Indonesian local governments.

Respondents came from eight work units directly involved in planning, finance, revenue, oversight, infrastructure, housing and investment. The 539 participants ranged from

agency leaders to functional and implementing staff, capturing strategic and operational experience of audit-related oversight.

Respondents were nested within 26 entities, but the single-level model did not estimate within-entity dependence. Moreover, all informants represented audited organisations, so the measures reflect auditee perceptions rather than external assessments.

2.4. Data sources and data collection

Primary data came from a self-administered questionnaire distributed through participating work units. Incomplete responses and those failing attention or consistency checks were removed, leaving 539 anonymous, voluntary responses.

Secondary statistics, financial statements, audit reports, and planning documents were used to define the sampling frame, verify eligibility, and contextualise the survey findings; they were not entered into the structural model.

2.5. Instrument, variables and measurement

Six reflective constructs were measured using 81 five-point Likert items. Economic growth, local revenue, investment, and accountability and effectiveness were exogenous; perceived audit-related oversight was the intervening construct; and regional development was the target outcome (Table 2). The oversight block captures perceived governance, transparency, and expenditure-efficiency consequences of external examination, not audit counts, burden, quality, or follow-up. This construct limitation qualifies the interpretation.

Table 2. Construct operationalisation

Construct	Conceptual definition	Indicator domains	Items
Economic growth (EG)	Sustained expansion in the capacity of the regional economy to produce goods and services	Investment activity; regional product; national product; inflation; consumption; unemployment	18
Local revenue (LR)	Aggregate fiscal resources available to the local government from own-source and transfer receipts	Revenue development capacity; institutional engagement; administrative flexibility	9
Investment (INV)	Capital placed in the regional economy with the expectation of future returns	Realised investment; investment ratio; ease of doing business; competitiveness; interest rates	15
Accountability and effectiveness (AE)	Obligation to account for the stewardship of public resources together with attainment of stated objectives	Long-term impact; resource efficiency; regulatory compliance; reporting quality; target attainment and transparency	15
Audit intensity (AI)	Perceived quality, transparency and expenditure-efficiency consequences of external examination of public financial management, as experienced by audited entities (a perceptual measure of experienced audit-related oversight; not a count of audit engagements, and distinct from audit quality, burden and follow-up, see Table 1)	Quality of public financial governance; budget transparency and accountability; efficiency and effectiveness of public spending	9
Regional development (RD)	Planning and implementation of policy directed at territorial welfare and economic inclusion	Accessibility and connectivity; economic welfare; education access and quality; basic infrastructure equity; investment distribution	15

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2.6. Validity and reliability

Content validity was assessed through expert review and pilot testing. The measurement model evaluated standardised loadings, Cronbach's alpha, rho_A and composite reliability (threshold 0.700), and average variance extracted (threshold 0.500) [23]. Discriminant validity was examined with the Fornell–Larcker, cross-loading, and HTMT criteria [24–26].

2.7. Data analysis technique

PLS-SEM was selected because the model combines large reflective blocks and prioritises prediction and explanation of regional development [27], [28]. Measurement quality was assessed before estimating structural paths.

Structural assessment covered R^2 , path signs and magnitudes, bootstrapped significance at the 5% level, and specific indirect effects calculated with delta-method standard errors. Mediation was classified as complementary, competitive, indirect-only, or absent using established PLS mediation guidance [29], [30].

Common method bias was mitigated through anonymity, item randomisation, and separated construct blocks, and assessed statistically through full collinearity [31], [32].

2.8. Ethical considerations

The study involved human participants and was conducted in accordance with the institutional research ethics requirements of the Postgraduate School, Universitas Sumatera Utara, and with the administrative clearances obtained from the participating provincial, district, and municipal governments during the first phase of fieldwork.

3. RESULTS AND DISCUSSION

3.1. Results

The results report respondent characteristics, measurement quality, structural and indirect effects, and hypothesis decisions.

3.1.1. Respondent profile.

Among 539 respondents, 76.6% were male, 71.8% were aged 40–59 years, 58.4% held a master's degree, and 94.1% represented district or municipal governments (Table 3). The sample therefore largely comprised experienced officials; item-level statistics for all 81 indicators appear in the supplementary material.

Table 3. Respondent profile (n = 539)

Characteristic	Category	n	Per cent
Sex	Male	413	76.6
	Female	126	23.4
Age	Under 30 years	22	4.1
	30–39 years	80	14.8
	40–49 years	214	39.7
	50–59 years	173	32.1
	60 years and above	50	9.3
Highest qualification	Master's degree	315	58.4
	Bachelor's degree or diploma	205	38.1
	Doctoral degree	19	3.5
Entity type	District and municipal governments	507	94.1
	Provincial government	32	5.9

Counts for sex and qualification are derived from the reported percentage distribution and may differ from the raw tabulation by one unit through rounding.

3.1.2. Measurement model.

All six constructs met reliability and convergent-validity criteria. Loadings ranged from 0.532 to 0.874; 16 indicators below 0.708 were retained because their removal did not materially improve reliability or AVE. Cronbach's alpha ranged from 0.886 to 0.963, composite reliability from 0.888 to 0.964, and AVE from 0.569 to 0.686 (Table 4).

Table 4. Measurement model assessment

Construct	Items	Loading range	α	rho_A	CR	AVE
Economic growth (EG)	18	0.657–0.811	0.959	0.961	0.959	0.569
Local revenue (LR)	9	0.619–0.865	0.886	0.913	0.888	0.686
Investment (INV)	15	0.672–0.820	0.953	0.954	0.953	0.575
Accountability and effectiveness (AE)	15	0.740–0.866	0.963	0.964	0.963	0.636
Audit intensity (AI)	9	0.686–0.874	0.929	0.934	0.930	0.599
Regional development (RD)	15	0.532–0.850	0.922	0.926	0.920	0.638

α = Cronbach's alpha; rho_A = reliability coefficient rho_A; CR = composite reliability; AVE = average variance extracted. Thresholds applied: α and CR above 0.700, AVE above 0.500.

Table 5 supports discriminant validity, subject to one marginal local-revenue item whose initial own loading (0.316) was slightly below its loading on investment (0.320). It was retained because construct reliability and convergent validity remained adequate, and its removal did not change structural estimates.

Table 5. Discriminant validity

Construct	AVE	$\sqrt{\text{AVE}}$	Highest cross-loading on another construct	Assessment
Economic growth (EG)	0.569	0.754	0.739 (on INV)	Satisfied
Local revenue (LR)	0.686	0.828	0.624 (on AE)	Satisfied, one marginal item
Investment (INV)	0.575	0.758	0.766 (on EG)	Satisfied
Accountability and effectiveness (AE)	0.636	0.797	0.702 (on AI)	Satisfied
Audit intensity (AI)	0.599	0.774	0.667 (on AE)	Satisfied
Regional development (RD)	0.638	0.799	0.678 (on EG)	Satisfied

3.1.3. Structural relationships

The model explained 67.0% of perceived audit-related oversight and 71.4% of regional development (Figure 2; Table 6).

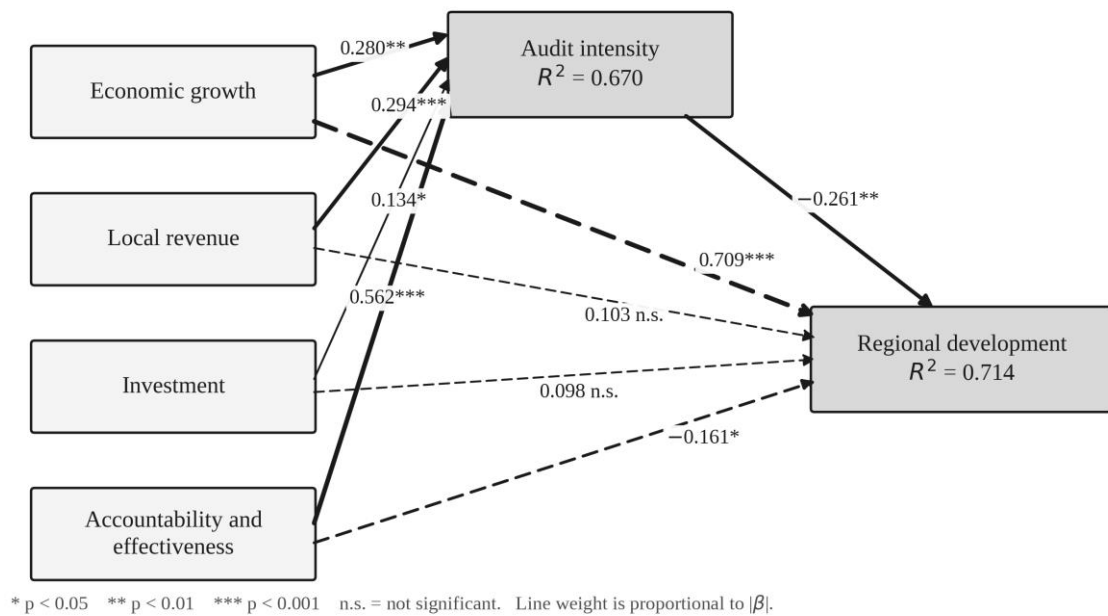


Figure 2. Estimated structural model with standardised path coefficients

All four antecedents were positively associated with perceived audit-related oversight: accountability and effectiveness ($\beta = 0.562$, $p < 0.001$), local revenue ($\beta = 0.294$, $p < 0.001$), economic growth ($\beta = 0.280$, $p = 0.001$), and investment ($\beta = 0.134$, $p = 0.036$).

For regional development, economic growth had the strongest positive coefficient ($\beta = 0.709$, $p < 0.001$); local revenue and investment were nonsignificant. Accountability and effectiveness ($\beta = -0.161$, $p = 0.017$) and perceived audit-related oversight ($\beta = -0.261$, $p = 0.008$) were negatively associated with development.

Table 6. Structural relationships

Relationship	β	SE	t	p	95% CI
Economic growth → Audit intensity	0.280	0.087	3.213	0.001	[0.109, 0.451]
Local revenue → Audit intensity	0.294	0.058	5.060	<0.001	[0.180, 0.408]
Investment → Audit intensity	0.134	0.064	2.101	0.036	[0.009, 0.259]
Accountability and effectiveness → Audit intensity	0.562	0.064	8.733	<0.001	[0.437, 0.687]
Economic growth → Regional development	0.709	0.076	9.306	<0.001	[0.560, 0.858]
Local revenue → Regional development	0.103	0.057	1.811	0.070	[-0.009, 0.215]
Investment → Regional development	0.098	0.084	1.167	0.243	[-0.067, 0.263]
Accountability and effectiveness → Regional development	-0.161	0.068	2.388	0.017	[-0.294, -0.028]
Audit intensity → Regional development	-0.261	0.098	2.656	0.008	[-0.453, -0.069]

Note: $R^2 = 0.670$ for audit intensity and 0.714 for regional development.

EG = economic growth; LR = local revenue; INV = investment; AE = accountability and effectiveness; AI = audit intensity; RD = regional development. Confidence intervals are symmetric intervals constructed from the bootstrap standard error. $R^2 = 0.670$ for audit intensity and 0.714 for regional development.

3.1.4. Mediated effects.

Because the oversight–development path was negative, all four specific indirect effects were negative. Table 7 reports their magnitude and mediation classification, while Figure 3 decomposes total effects.

Table 7. Indirect effects through audit intensity

Indirect relationship	Indirect effect	SE	t	p	Direct effect	Mediation pattern
Economic growth → Audit intensity → Regional development	−0.073	0.036	2.052	0.040	0.709	Competitive
Local revenue → Audit intensity → Regional development	−0.077	0.033	2.358	0.018	0.103	Indirect-only
Investment → Audit intensity → Regional development	−0.035	0.021	1.646	0.100	0.098	No mediation
Accountability and effectiveness → Audit intensity → Regional development	−0.147	0.058	2.549	0.011	−0.161	Complementary

Figure 3 presents direct-effect confidence intervals and the direct–indirect decomposition.

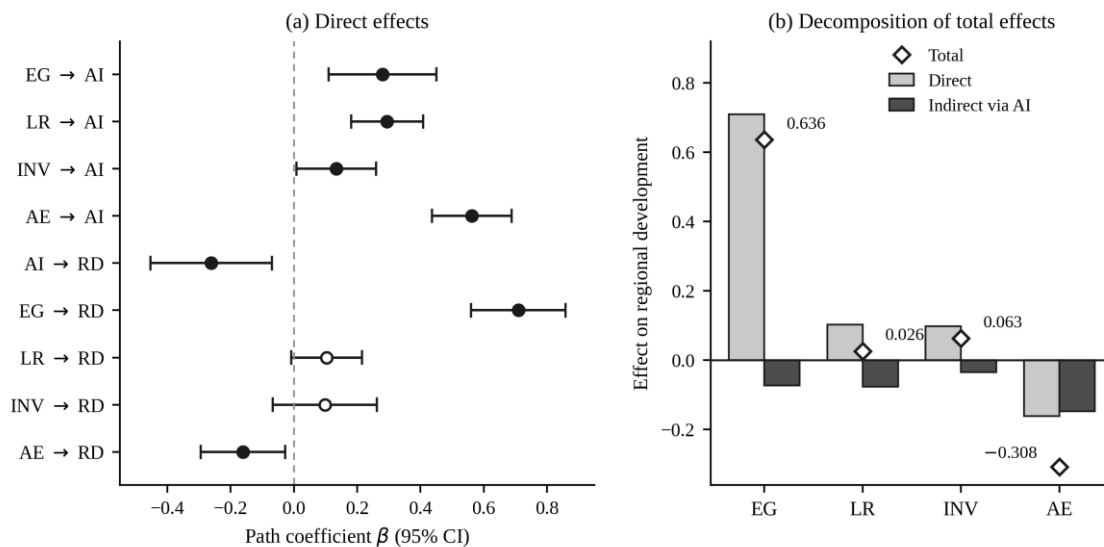


Figure 3. (a) Direct effects with 95% confidence intervals; (b) decomposition of total effects on regional development

3.1.5. Hypothesis testing.

Table 8 applies the 5% significance level to H1–H9; a significant coefficient with the opposite hypothesised sign is recorded as unsupported.

Table 8. Summary of hypothesis testing

Hypothesis	Path	β	p	Decision
H1	Economic growth → Audit intensity	0.280	0.001	Supported
H2	Local revenue → Audit intensity	0.294	<0.001	Supported
H3	Investment → Audit intensity	0.134	0.036	Supported
H4	Accountability and effectiveness → Audit intensity	0.562	<0.001	Supported
H5	Economic growth → Regional development	0.709	<0.001	Supported
H6	Local revenue → Regional development	0.103	0.070	Not supported
H7	Investment → Regional development	0.098	0.243	Not supported
H8	Accountability and effectiveness → Regional development	−0.161	0.017	Not supported (significant, opposite sign)
H9	Audit intensity → Regional development	−0.261	0.008	Supported as a relationship; sign is negative

3.1.6. Summary of key findings.

Three findings dominate: every antecedent was positively associated with perceived audit-related oversight; economic growth was the strongest positive correlate of development, whereas local revenue and investment were nonsignificant; and oversight was negatively associated with development. The model explained 67.0% and 71.4% of the two endogenous constructs, respectively.

3.2. Discussion

3.2.1. Restatement of the main findings.

Perceived audit-related oversight and accountability and effectiveness were negatively associated with regional development. Consequently, the indirect patterns were competitive for economic growth, indirect-only for local revenue, complementary for accountability and effectiveness, and absent for investment.

3.2.2. Interpreting the audit intensity–development relationship.

The negative oversight–development association does not imply that auditing inherently constrains development. Indonesian performance audits can improve planning, control and governance while increasing documentation demands [33]. The result is therefore consistent with benefits from scrutiny coexisting with implementation costs when response requirements exceed administrative capacity.

The construct measures officials' experience of audit-related governance, transparency and expenditure efficiency rather than audit frequency or volume. Its negative coefficient may reflect an imbalance between oversight requirements and response capacity. Administrative delay and costly procedures can impair organisational performance [34], as red-tape and burden research also suggests [19], [20]. However, burden and follow-up were

not measured; they remain candidate mechanisms that future studies should test independently using established instruments [35].

3.2.3. The accountability–development relationship.

The negative accountability coefficient likewise does not show that accountability reduces development. A more plausible interpretation is that formal accountability may fail to improve delivery when governance design, institutional conditions and managerial capacity are misaligned [36].

3.2.4. Mediated pathways across the four antecedents.

Economic growth remained the principal positive correlate of development. Its negative indirect effect through oversight reduced but did not reverse the direct association, suggesting that expanding fiscal activity may create administrative demands that do not transmit growth benefits in the same direction.

Local revenue was positively associated with oversight but not directly with development; its negative indirect effect left a near-zero total relationship. Fiscal capacity alone may therefore be insufficient unless resources are effectively converted into implementation.

Investment was positively associated with oversight but had neither a significant direct nor indirect association with development. Sectoral explanations require data on investment type, location, and local linkages that this study does not contain.

Because all variables were measured simultaneously, the indirect effects partition concurrent associations rather than temporal processes; cross-sectional mediation may differ substantially from longitudinal parameters. Accordingly, the mediation labels describe model covariance, not causal transmission.

3.2.5. From audit activity to audit follow-up.

Audit value depends not only on scrutiny but also on converting findings into improvement. Evidence from Indonesia and municipal government elsewhere links impact to recommendation implementation, administrative capacity, internal control and monitoring [37]. Performance should therefore emphasise resolved findings and their integration into subsequent planning and budgeting.

As public audit expands beyond financial compliance into performance, governance and sustainability, its organisational demands also increase [38,39]. The policy task is to connect oversight with implementation through coordinated follow-up, internal control, planning and budgeting.

3.2.6. Theoretical, practical and policy implications.

Theoretically, the study positions perceived audit-related oversight as an intervening construct, identifies different indirect-effect patterns across four antecedents, and shows why separating audit intensity, quality, burden, follow-up and effectiveness matters for interpreting inconsistent evidence.

Practically, managers should track how quickly recommendations are resolved and incorporated into planning, rather than focusing only on scrutiny volume. Formal accountability without sufficient implementation capacity may accumulate procedures faster than delivery.

Policy should preserve external scrutiny while closing the gap between findings and implementation. Follow-up completion should be reported, recommendation settlement linked to planning and budgeting, and audit-response demands monitored to identify when additional oversight no longer yields improvement.

3.2.7. Limitations of the study.

The findings are limited by the cross-sectional, single-informant, and perceptual design; the governance-oriented oversight measure does not directly capture audit volume, quality, burden, or follow-up. The single-level model also ignores respondent clustering, while purposive selection of comparatively high-performing entities restricts generalisation beyond North Sumatra.

3.2.8. Directions for future research.

Future research should use longitudinal, multilevel designs across more heterogeneous entities; compare perceptual oversight with archival audit counts and settlement records; and measure audit-related burden independently using validated job-centred instruments [35].

4. CONCLUSION

This study tested whether perceived audit-related oversight intervenes in the relationships between fiscal-economic conditions and regional development using cross-sectional survey data from 539 officials in 26 North Sumatran government entities.

Economic growth, local revenue, investment, and accountability and effectiveness were positively associated with oversight, whereas oversight was negatively associated with development. Economic growth retained the strongest positive direct association; the indirect patterns were competitive for growth, indirect-only for local revenue, complementary for accountability and effectiveness, and absent for investment. Thus, oversight did not provide the positive intervening pathway assumed in policy discourse.

This conclusion remains associational: simultaneous perceptual measurement precludes causal mediation, respondents are clustered within a single-level model, and purposive sampling favours high-performing entities. The study therefore identifies a counterintuitive statistical pathway for confirmation rather than demonstrating that audit creates compliance burden.

The study clarifies adjacent audit constructs and indicates that developmental value may depend less on scrutiny volume than on converting findings into corrective action and subsequent plans and budgets. Longitudinal, archival, and multilevel research should test this mechanism directly across more diverse settings.

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