International Journal of Advanced Scientific Research
www.allscientificjournal.com
E-ISSN: 2456-0421
Received: 25-09-2026, Accepted: 25-10-2026, Published: 09-11-2026
Volume 11, Issue 4, 2026, Page No. 57-61

Sustainability assurance adoption in Indonesia: A targeted evidence review and exploratory conditional meta-analysis

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DOI: https://doi.org/10.66856/ijasr.2026.11.4.11089

Abstract
Purpose: This study examines evidence on the adoption, quality, and consequences of sustainability assurance among Indonesian firms and tests the feasibility of quantitative synthesis.
Methods: A targeted web search of publisher and institutional repository sources was followed by full-text review of accessible articles. Pooling was restricted to the association between audit committee meeting frequency and assurance adoption in two sector-based studies. Logit coefficients were analysed with a random-effects model using restricted maximum likelihood (REML) for heterogeneity and modified Knapp–Hartung (mKH) intervals. One standard error was reconstructed from the reported coefficient and a rounded two-sided p-value.
Results: The conditional pooled estimate was an odds ratio (OR) of 1.068 per additional audit committee meeting per year (95% CI [0.608, 1.879]; $p = .376$; $I^2 = 56.4\%$; $k = 2$).
Conclusion: The available evidence does not yet support a precise pooled estimate. The findings are exploratory and depend on the assumption that the two samples do not overlap and on the validity of the reconstructed uncertainty. This study is not a comprehensive systematic review.

Keywords: Sustainability assurance, Indonesia, audit committee, meta-analysis, sustainability reporting, corporate governance

Introduction

Sustainability assurance is an independent engagement intended to increase confidence in sustainability information. Several constructs are often treated as one but are conceptually distinct: the adoption of assurance, the choice of provider, the scope of assurance, and the level of assurance obtained. The presence of an assurance statement does not by itself demonstrate that all ESG information has been verified or that environmental performance has improved. The international study by Simnett, Vanstraelen, and Chua (2009) [13] provides a foundation for distinguishing the decision to obtain assurance from the choice of assurance provider.

In the Indonesian regulatory context, Appendix II of POJK 51/POJK.03/2017 refers to independent verification "if applicable" (*jika ada*). This wording should not be read as a universal assurance requirement. Our statement is limited to the content of that regulation; we do not claim to have audited all regulatory changes in Indonesia up to 2026 (Otoritas Jasa Keuangan [OJK], 2017) [10].

The central question of this study is whether governance mechanisms are associated with the decision to obtain assurance. The quantitative analysis is deliberately narrowed to audit committee meeting frequency, because similarity in variable names alone is not sufficient justification for pooling determinants that were measured differently across studies. Hay *et al.* (2023) [6] also highlight the problem of measurement comparability in the synthesis of assurance research.

Methods

1. Design and Research Question

The study design is a targeted evidence review with a conditional, exploratory meta-analysis. The population is Indonesian firms. The exposure is one additional audit committee meeting per year, and the comparator is a lower meeting frequency. The outcome is the presence of independent sustainability assurance, coded 1 versus 0. The effect measure is the adjusted odds ratio from logistic regression. These estimates reflect conditional associations given the covariates of the original studies and should not be interpreted as causal effects.

2. Search Procedure

The search was conducted on 4 November 2026 using a general web search engine. Search terms included "sustainability assurance" Indonesia, "sustainability report assurance" Indonesia, "assurance" with sustainability committee, and titles of articles identified in the initial search. Publisher pages, DOIs, university repositories, and reference lists of identified articles were used to trace related sources.

The search did not include exports from Scopus or Web of Science, had no prospective protocol registration, and was conducted by a single reviewer. Because a web search does not produce a deduplicated bibliographic export, we did not report the total number of records identified, the number excluded at each stage, or a PRISMA flow diagram. The six studies in Table 1 are the core sources discussed here and do

not represent the full population of eligible articles. PRISMA 2020 [11] (Page *et al*., 2021) was used as a reporting reference rather than as a claim of full compliance.

3. Eligibility for Pooling and Separation of Outcomes

To be pooled, quantitative studies had to report a comparable assurance-adoption outcome, an exposure measured on the same scale, and coefficients with extractable uncertainty. Findings on assurance quality, firm value, cost of capital, and moderation effects were analysed separately. Logit and probit estimates were not pooled without a defensible transformation. Coefficients for a one-percentage-point change in ownership were not combined with coefficients for a 0–1 proportion.

Two sector-based articles were analysed under the provisional assumption that manufacturing and energy firms constitute separate samples. Firm lists had not yet been matched at the level of issuer and year. Consequently, the pooled result is not treated as a confirmatory estimate. If observations overlap, covariance information or the selection of one non-duplicated sample would be required.

4. Quality Appraisal

Each study was reviewed for sample selection, precision of variable definitions, number of assurance events, control for confounding, handling of repeated observations, consistency of statistical tables, and data transparency. The appraisal was qualitative and performed by a single reviewer; it does not constitute a formally validated risk-of-bias assessment by two independent raters. Synthesis without pooling was reported in line with the SWiM guideline (Campbell *et al*., 2020) [2], and vote counting of statistically significant results was not used as evidence of a combined effect.

5. Statistical Analysis

Effect sizes were expressed as log odds ratios (β), and variances (v) were calculated as the squared standard errors. For two studies ($k = 2$), the REML estimate of between-study variance was calculated as

$$\tau^2 = \max\{0, [(\beta_1 - \beta_2)^2 - v_1 - v_2] / 2\}.$$

This formula is specific to two studies and is not a general expression for larger meta-analyses. Random-effects weights were calculated as $w_i = 1 / (v_i + \tau^2)$, and the pooled estimate was $\mu = \Sigma w_i \beta_i / \Sigma w_i$. The mKH variance was

$$\mathrm{Var}(\mu) = \max\{1, \Sigma w_i(\beta_i - \mu)^2 / (k - 1)\} / \Sigma w_i,$$

and the 95% confidence interval was $\exp[\mu \pm t_{0.975}, k-1 \times \mathrm{SE_mKH}]$. With one degree of freedom, the interval is wide. Heterogeneity was assessed using Cochran's Q with fixed-effect weights ($1/v_i$) and the I^2 statistic. For comparison, a conventional random-effects interval based on the normal distribution was also computed.

The standard error for the manufacturing study was reconstructed as $\mathrm{SE} = |\beta| / \Phi^{-1}(1 - p/2)$, where $p = 0.915$ is the rounded two-sided p-value reported in the article, assuming a normal Wald test. Because the inputs were rounded, the reconstructed values are approximations. All calculations are reproducible with the base R code in Appendix A.

Results

1. Evidence Matrix

Table 1: Sources Included in the Evidence Matrix and Their Role in the Analysis

Source	Sample or context	Role in this review
Meutia *et al*. (2022) [9]	28 ASRRAT firms; 140 reports; 2017–2021	Determinants of adoption; not pooled
Utami *et al*. (2024) [14]	237 firms; year 2022	Sustainability committee; individual estimate
Gunawan & Kurniawati (2026) [3]	55 manufacturing firms; 2021–2024	Meeting frequency; exploratory input
Hezekiah & Kurniawati (2026) [3]	52 energy firms; 208 observations; 2021–2024	Meeting frequency; exploratory input
Hamidah & Naimah (2025) [4]	Indonesian listed firms	Cost of equity capital; abstract-based synthesis
Harymawan *et al*. (2020) [5]	Pooled Indonesian and Malaysian sample	Firm value; comparative context

Note: The matrix does not sum samples as unique firms. Cross-country sources were not treated as Indonesia-specific estimates unless country-specific coefficients were available. For the two consequence studies, interpretation was limited to information verified from the abstracts, not a full assessment of model specifications and robustness checks.

Table 1 lists the six core sources. Only the two sector-based articles on meeting frequency were pooled.

2. Data Extracted for the Meeting-Frequency Relationship

Table 2: Extracted Logit Coefficients for Audit Committee Meeting Frequency

Study and table location	β (logit)	SE	OR and 95% CI (individual)
Gunawan & Kurniawati (2026) [3], Table 6, p. 413	0.006	0.056215†	1.006 [0.901, 1.123]
Hezekiah & Kurniawati (2026) [3], Table 4, p. 237	0.098969	0.024607	1.104 [1.052, 1.159]

Note: †The first SE was reconstructed from β = 0.006 and p = 0.915 under a two-sided normal Wald test. Because the inputs were rounded, this value is approximate. Both exposures were measured as the number of meetings per year. The first model included institutional ownership, ROA, leverage, and firm size. The second model included institutional ownership, ownership concentration, and the existence of a sustainability committee. These differences in covariates limit the comparability of the estimands.

The manufacturing study reports 55 firms over four years. However, the classification table contains totals that are inconsistent with the sum of its cells. We recorded this inconsistency as a reason to request clarification from the authors rather than correcting it silently. In addition, it was not confirmed whether the reported standard errors accounted for clustering of observations within firms.

3. Conditional Pooled Estimate

Table 3: Conditional Exploratory Random-Effects Meta-Analysis

Parameter	Result
Number of studies	2
Effect size	OR per additional meeting per year
Model	Random-effects, REML, mKH interval
Pooled OR	1.068
95% CI	0.608 to 1.879
Two-sided *p*	.376
τ^2 (log OR scale)	0.002439
Cochran's *Q* and I^2	$Q = 2.295$, df = 1, $I^2 = 56.4\%$

Figure 1. Individual estimates use Wald normal intervals. The pooled estimate uses an mKH interval with a t distribution and one degree of freedom. All values are recalculated from the statistics reported in the articles and are not outputs reported by the original authors.

The point estimate corresponds to approximately 6.8% higher odds of assurance adoption per additional meeting. This is not an increase of 6.8 percentage points in probability. The interval includes odds ratios both below and above one. The supported conclusion is uncertainty about the pooled association, not evidence that meetings have no effect.

We did not treat I^2 as a stable classification of heterogeneity because $k = 2$. The random-effects interval based on the normal distribution is 0.979 to 1.166, which is considerably narrower than the mKH interval. This comparison shows that the choice of inference method matters greatly when the number of studies is very small. Methodological work on this issue (Röver *et al*., 2015; Bender *et al*., 2018) [1] discusses the limitations of inference in such settings.

If the study with reconstructed SE is excluded, only one study remains and meta-analysis cannot be performed. Egger's test, funnel plots, meta-regression, and prediction intervals were not reported because the number of studies is insufficient for meaningful interpretation. The pooled estimate should be withdrawn if the independence of the samples or the validity of the standard errors cannot be established.

Discussion

1. Governance Requires Specific Measurement

Utami *et al*. (2024) [14] reported an OR of 4.397 (95% CI [1.624, 11.903]) for the existence of a sustainability committee. This individual finding is consistent with the possibility that specialised oversight structures are related to assurance adoption. However, this study was not added to the meeting-frequency model because the existence of a committee and the intensity of meetings represent different exposures. In addition, the 2022 sample may overlap with the sector-based studies covering 2021–2024.

Meutia *et al*. (2022) [9] used a disclosure-based governance measure linked to GRI. This measure is not equivalent to a sustainability committee dummy. Table 6 of that study contains z and p pairs that are inconsistent with a two-sided normal test; for example, ROA is reported with z = 0.6 and $p = .024$. For this reason, variance was not reconstructed for pooling until the authors clarify these values. The abstract's statement of significance is not sufficient to resolve the inconsistency in the tables.

2. Assurance Adoption Has Not Yet Been Shown to Yield Causal Economic Benefits

Hamidah and Naimah (2025) [4] reported that assurance and the involvement of a Big Four firm strengthen the negative relationship between sustainability reporting and equity cost of capital. Harymawan *et al*. (2020) [5] reported a positive association between external assurance disclosure and firm value in a pooled Indonesian and Malaysian sample. Both results provide a rationale for testing information credibility as a mechanism. However, they cannot be combined into a single measure of economic benefit for Indonesia.

Methodologically, larger firms, firms with greater public visibility, or firms with stronger ESG systems may adopt assurance earlier. The same factors may also be related to valuation or the cost of financing. Observational regression and statistical controls do not rule out all such selection. Claims that assurance causes higher firm value require stronger identification designs than correlational analysis.

3. Provider Quality and Engagement Content

The type of assurance provider should be distinguished from the quality of the engagement. Public accounting firms, Big Four firms, and non-accounting providers do not automatically form a single quality ranking that applies to all engagements. Coding of engagement quality should therefore capture independence, competence, standards applied, level of assurance, scope of indicators, materiality, evidence obtained, and the form of the conclusion. This approach is consistent with the need to distinguish adoption from provider choice in the international literature (Hay *et al*., 2023; Simnett *et al*., 2009) [6, 13].

ISSA 5000 applies to information for periods beginning on or after 15 December 2026, or to information as at dates on or after that date, with early application permitted (International Auditing and Assurance Standards Board [IAASB], 2024) [8]. The international effective date does not automatically become an Indonesian compliance date. Historical samples should not be labelled as compliant with ISSA 5000 without evidence that this standard was applied.

4. Limitations

Table 4: Principal Limitations and Their Implications for the Findings

Issue	Implication for the results
Targeted search by a single reviewer	Relevant articles may have been missed; results are not a census of the Indonesian literature
Only two studies pooled	Heterogeneity and the average effect are highly uncertain
Independence between sectors not audited	Cross-study covariance may not be zero
Panel standard errors not confirmed	Intervals may be too narrow if repeated observations of firms were ignored
SE reconstructed from rounded values	Weights and intervals are approximate only
Control sets differ; ORs not collapsible	Adjusted ORs may differ even when the underlying relationship is similar
Purposive selection and few assurance events	Generalisability and stability of coefficients are limited

These uncertainties cannot be resolved simply by selecting a random-effects model. Such a model accommodates variation in effects but does not correct erroneous data, different outcomes, sample overlap, or unmeasured confounding. For this reason, the narrative synthesis and quality appraisal are more decisive for substantive conclusions than the pooled point estimate.

5. Implications for Firms and Regulators

Firms could clarify the audit committee's responsibility for the quality of ESG information, ensure that meeting agendas address material risks, and document the follow-up of assurance findings. These are governance considerations rather than interventions whose effectiveness has been demonstrated by the pooled odds ratio. Increasing the number of meetings alone currently lacks precise pooled empirical support.

Regulators and report users could strengthen comparability by requiring disclosure of the assurance provider, the standard applied, the scope of indicators, the level of assurance, and any limitations of the engagement. This study is not sufficient to establish that a universal assurance mandate would produce net benefits. Such a judgement also requires evidence on costs, provider capacity, and the impact on report users.

6. Directions for a Full Systematic Review

A full systematic review and meta-analysis would require several steps. First, the research question and analysis plan should be registered in advance (for example, on the Open Science Framework), with all deviations from this exploratory study documented. Second, searches should cover Scopus, Web of Science, Google Scholar, GARUDA, and citation tracking, in both Indonesian and English. A starting search string is:

("sustainab*" AND "assur*" OR "sustainability report assurance" OR "CSR assurance" OR "external assurance" OR "penjaminan laporan keberlanjutan" OR "asurans laporan keberlanjutan") AND (Indonesia* OR "Bursa Efek Indonesia" OR "Indonesia Stock Exchange")

Wildcard and phrase syntax must be adapted to each database. Third, screening should be performed by two independent reviewers with documented reasons for full-text exclusion, and records should be deduplicated by DOI and sample. Fourth, extraction should record firm lists, years, sectors, variable definitions, models, covariates, coefficients, standard errors, and clustering. Fifth, the authors of the two quantitative studies should be asked for exact standard errors, corrected tables, estimation code, and firm lists. Sixth, pooling should be carried out by exposure and outcome, using non-overlapping samples and estimators that handle panel data. Sensitivity analyses should exclude reconstructed standard errors and problematic studies. Reporting should follow PRISMA 2020 [2] and SWiM for any groups that are not pooled, and analysis data and code should be made openly available.

Variables that merit separate analysis include sustainability committees, firm size, profitability, leverage, institutional ownership, and stakeholder pressure. Non-significant results should also be extracted. Interaction coefficients, direct effects, and simple correlations should be stored as distinct estimands. Specifying one effect per sample and one research question per analysis would prevent studies with many models from receiving disproportionate weight.

If variation in design and data continues to prevent pooling, the final report may take the form of a systematic review with synthesis without meta-analysis. This option is more defensible than producing a single pooled estimate from constructs and samples that are not comparable.

Conclusion

The Indonesian evidence reviewed here indicates that sustainability assurance should be studied as a distinct adoption decision, a set of engagement characteristics, and a source of information consequences. The meta-analysis of two studies on audit committee meeting frequency yields a conditional OR of 1.068 (95% CI [0.608, 1.879]). This estimate does not support a precise association and is not a sufficient basis for causal claims or national generalisation. The contribution of this study lies in narrowing the estimand, transparently extracting statistics, and identifying the conditions that must be met before a confirmatory synthesis can be undertaken.

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