“Do ESG practices affect the financial performance of banks? A meta-analysis perspective”

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DO ESG PRACTICES AFFECT THE FINANCIAL PERFORMANCE OF BANKS? A META-ANALYSIS PERSPECTIVE

Abstract

This study aims to investigate the pooled effects of environmental, social, and governance (ESG) practices on banks' financial performance (FP) using a random effects model of meta-analysis. In line with the PRISMA guidelines, 52 studies were identified as eligible out of 387 studies for this analysis. After applying the inclusion criteria, i.e., studies that have quantitatively reported the required measures like the correlation coefficient between ESG and FP, 16 studies were considered for meta-analysis with a combined total sample of 4,084 participants. The combined effect size was r = 0.10 (SE = 0.10, 95% CI: –0.11 to 0.31), reflecting a weak and insignificant correlation, and hence displaying no impact of ESG practices on the financial performance of banks during the study period 2018 to 2025. Furthermore, the predicted interval was –1.38 to 1.59, which means that future research would provide very heterogeneous effect sizes. A heterogeneity analysis shows that there is wide variation among the studies (Q = 1213.82, $p < 0.001$, $I^2 = 98.76\%$), indicating that differences in study characteristics may lead to differences in effect sizes. The trim and fill method provides no evidence for the existence of missing studies; however, publication bias is considered a possibility. The findings should be interpreted cautiously, given their high heterogeneity and the suspected source of bias. Despite their small effect size, inconsistencies across studies highlight the need for future research to investigate possible moderating factors. Practical implications emphasize that even if the generalizability of the findings is established, it cannot be without considering study-specific variables.

Keywords banking sector, meta-analysis, ESG practices, financial performance, sustainability

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INTRODUCTION

Globally, the sustainability movement has evolved from being a voluntary initiative to becoming an essential mandate driven by regulatory frameworks and global agreements. Organizations worldwide now embed sustainable practices into their core strategies to stay competitive, efficient, and responsible towards environmental and social goals. Sustainability has become an irreplaceable part of corporate strategy for the financial sector because the present era brings escalating environmental and social difficulties. In this context, the banking sector, as a key economic pillar, has increasingly embraced environmental, social, and governance (ESG) principles. By aligning their operations with global sustainability imperatives, banks strive to create greater value for the stakeholders while addressing environmental challenges. The banking sector applies ESG principles in its operations because it understands their crucial role in managing globally important matters involving climate change, social inequalities, and corporate governance issues. Banking institutions have become vital leadership forces for integrated economic development through sustainable paths because their operations extend beyond the basic financial services.

The key instrument banks use to reveal their ESG achievements and demonstrate their commitment to sustainability principles is sustainability reporting. These tools accomplish three specific objectives that strengthen stakeholder trust, attract investor consideration of ESG factors, and create sustainable financial practices. Studies examining the impact of ESG practices on banking performance yield conflicting and contradicting results. ESG integration produces financial advantages because it enhances risk management practices and operational efficiency, but sometimes creates challenges to financial performance measures.

The study examines the essential ESG components that drive sustainable financial practices, offering executive guidelines for policymakers, banking presidents, and regulatory entities. The researchers apply a comprehensive meta-analysis methodology to blend previous research findings and analyze the effects of ESG initiatives on banks with both financial and non-financial metrics. The provided recommendations will function as an essential measure to implement effective ESG strategies that help banking institutions achieve sustainability targets while maintaining financial accomplishment and prudence. This study works towards sustainable banking model improvement by combining financial incentives with environmental and social criteria.

1. LITERATURE REVIEW

Banks that prioritize ESG criteria obtain better market position along with stronger relationships with stakeholders and improved capabilities to address environmental and social issues, according to Torre et al. (2021). Through ESG adoption, banks acquire the capability to handle environmental threats while upholding social responsibilities and maintaining ethical organizational governance practices. The strategic business advantages described by Cohen (2023) include getting social-minded investors and enhancing regulatory measures. ESG integration creates financial stability together with better risk management and long-term success in banking systems (Zioło et al., 2019).

A study by Hughes et al. (2021) demonstrates that ESG integration creates financial accessibility for all through responsible corporate operations, which yield profitable outcomes that help achieve sustainability goals worldwide. Accomplished ESG dedication provides businesses with enduring stability and resistance against market changes. The findings of Zahid et al. (2023) explains that ESG contributes to both ethical investment practices and enhanced customer confidence. According to Bruno and Lagasio (2021), the implementation of ESG measures generates value for banks through the reduction of risks, superior lending choice capabilities, and reduced legal consequences.

According to Becker (2007), the changing population demographics create opportunities in the financial product market. Prabhu and Aithal (2021) find that both ethical banking services and sustainability create customer attraction, leading to changes in financial decisions. According to Dao and Nguyen (2020), bank performance depends on social factors through changes in customer loyalty and bank deposits, while negative publicity reduces bank profitability. According to Reinman (2015), service access is impacted by social customs, while banks acquire opportunities to create innovative solutions for various communities.

A well-strategic approach to ESG management results in lower funding expenses and improves financial stability. According to Lopez-de-Silanes et al. (2020), bank performance depends on investor trust, compliance, and profitability. The study by Zhan (2023) demonstrates that robust ESG criteria create a better reputation and bring in both a sustainable investor base and stakeholder partnerships. Newton et al. (2022) explains the banks protecting their clients through strong ESG metric performance reduce climate risks, social risks, and governance risks, along with their credit and regulatory risk exposure, to build long-term survival potential.

The establishment of ethical governance improves stakeholder trust, which subsequently leads to reduced interest expenditures and enhanced market value, according to Moridu

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(2023). The study by Zagorchev and Gao (2015) demonstrates that well-governed corporations achieve superior banking outcomes and maintain stability. A well-executed risk management system significantly performs as an instrument to reduce both financial and operational losses. According to Grove et al. (2021), financial excellence emerges from boards that are structured well and diverse. A study by Mitchell et al. (2023) demonstrates that substandard governance both degrades financial results, heightens risks, and erodes organizational standing in the market.

Bank credit analysis needs ESG metrics to operate as basic evaluation components, according to Azmi et al. (2020). Dedicated ESG practices bring in customers and provide environment friendly financing solutions that create financial stability (Torre et al., 2021). The execution of ESG rating achievements implements critical business elements that help banks thrive through long-lasting periods. The study by Filbeck et al. (2019) demonstrates that ESG deficiencies create negative results, which harm reputation, reduce investor trust, and increase financing expenses and impact profit levels.

Better financial results of banks reflect strong ESG practices, leading to increased Return on Assets (ROA) or Return on Equity (ROE) performance. Research by Buallay (2019), Bătae et al. (2020), and Prasad and Mondal (2025) indicated that ESG factors have positive impacts on bank performance, while Al-Jalahma et al. (2020), Khoury et al. (2021), and Amara and Benali (2023) reported negative results.

The existing body of literature suggests that integrating environmental, social, and governance principles significantly contributes to strengthening banks' financial stability and fostering enduring resilience in the face of environmental and social challenges. Banks that embed ESG considerations into strategic and operational decisions are better equipped to attract socially responsible investors and align with evolving regulatory expectations. Empirical studies consistently highlight that effective ESG adoption enhances stakeholder relationships and reinforces a bank's market position. Furthermore, ethical banking practices deepen consumer confidence and bolster brand equity, thereby facilitating sustainable business growth. The governance dimensions, particularly board structure and diversity, emerge as critical determinants of financial performance. In contrast, deficiencies in ESG practices or a weak governance framework can undermine a company's reputation and elevate operational and financial risks. While integrating ESG into lending and investment decisions generally supports sustainable outcomes, the impact observed across different contexts remains heterogeneous, underscoring the complexity of ESG's influence on bank performance.

Within this context of increasing emphasis on sustainable finance, it is imperative to systematically examine the aggregated impact of ESG practices on the financial performance of banks through a meta-analytic lens. This approach facilitates the identification of consistent patterns and variations across empirical studies while also addressing potential publication bias. By consolidating diverse research findings, this study aims to provide a clearer understanding of the relationship between ESG initiatives and financial outcomes. The derived insights aim to guide researchers, policymakers, and banking professionals in formulating strategies and reconciling the pursuit of sustainability objectives with the imperative of maintaining robust financial performance.

The primary objective of this study is to reveal a comprehensive impact of ESG practices on the financial performance (FP) of the banking sector, hence revealing whether an impactful relation exists between them. This is to facilitate more efficient and well-coordinated decision-making in a bank's ESG activities. To achieve the objective, the study comprises three major research activities:

a) to illustrate existing literature on titled terms (i.e., ESG and FP);

b) to calculate the pooled effect between ESG and FP of banks; and

c) to conclude whether ESG practices have any significant impact on the FP of banks as a whole.

The study develops the following research hypothesis to analyze the effect of ESG practices on the financial outcomes of banks.

H_1: *There is a significant positive pooled effect of ESG practices on the financial performance of banks.*

2. METHODOLOGY

The study adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach with identification, screening, eligibility, and inclusion. A systematic search in databases such as Google Scholar, Scopus, and Web of Science using keywords related to "Environmental, Social, & Governance (ESG)" and "Banking Financial Performance" was performed. The studies were rigorously filtered for the banking industry. Only those studies that have reported the correlation coefficient (r) between ESG and Return on Assets (ROA) or Return on Equity (ROE) are considered. Two independent reviewers screened these studies based on predetermined criteria and resolved the conflicts through discussion. The meta-analysis was conducted using "Meta Essentials" software.

According to the PRISMA guidelines, a clear and methodical search strategy was employed to capture the suitable studies relevant to meta-analysis. In total, 387 records were initially captured through multiple search databases, with pre-specified keywords and Boolean operators. The initial step in the screening process was the exclusion of duplicate records, followed by title and abstract screening with two independent reviewers. After screening for relevance to the research questions and initial eligibility criteria, 52 studies were shortlisted for full-text assessment. Finally, all the studies were extensively screened against a strict list of pre-specified inclusion and exclusion criteria, based on study design, sample size, type of reported data, population, and availability of quantitative data for synthesis. Post the strict filtering process, 16 studies with a collective sample size of 4,084 stood entirely eligible to be included in the final meta-analysis. All these studies satisfied all the methodological standards, such as reporting transparency, clarity of statistical methodology, and alignment with the conceptual framework of the review. The included studies covered publication dates from 2018 to 2025, mirroring the synthesized evidence to be recent and representative of the current trend within the field. This systematic process of identification, screening, assessing eligibility, and inclusion is concordant with the four-step PRISMA flow, maximizing transparency and replicability of the review. All decision points were recorded in accordance with the best practice synthesis of evidence.

2.1. PRISMA-based review analysis

A study by Birindelli et al. (2018) demonstrated that bank sustainability performance associates positively with female directors, increased board sizes, and CSR committees. Actions of gender-balanced corporate leadership teams supported sustainability performance metrics, yet independent directors created detrimental effects on company ESG metrics. The study by Buallay (2019) examined European bank performance using ROA, Tobin Q, and ROE metrics, which discovered that environmental disclosure enhanced ROA and Tobin Q but social disclosure produced negative results across all metrics. Governance effects varied across indicators.

Al-Jalahma et al. (2020) studied how bank financial performance is linked to ESG ratings through ROA measurement, yet discovered no significant connection between ROE. Sustainability reporting generated negative impacts on bank return on equity performance, but did not cause any changes to return on assets. Batae et al. (2020) established a linked system of ESG elements in European banking that produced the strongest effects from social performance measurements. The performance of major banks in Europe outstripped that of smaller institutions to deliver better ESG ratings, even though they faced public scrutiny in governance issues.

Khoury et al. (2021) studied MENAT banking data (2007–2019) to discover that ESG factors created non-straightforward connections to performance since governance measures related inversely to accounting metrics, but environmental elements had a positive direct impact on market results. During the period 2016–2020, Menicucci and Paolucci (2022) studied Italian banks to discover that emission reduction strategies produced positive results, but general ESG policies generated negative effects. A well-designed governance system demonstrated

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positive impacts on return on assets and return on equity, but product responsibility produced negative effects on accounting results.

A research study by Alamsyah and Muljo (2023) demonstrated how ESG variables generated an unfavorable impact on ROA and Tobin's Q; however, these variables produced positive effects on ROE for Asian Pacific banks. The links between environmental factors and ROE remained weakly positive, yet social and governance elements displayed no substantial performance connections. ESG budget allocations proved significant in affecting both ROA and ROE measurement in Tunisian private banks, as per Amara and Benali (2023), although ESG practices failed to yield major performance enhancements. A bank's size produced a positive impact on its performance, yet extended age created a negative impact on results. Işık (2023) studied commercial banks throughout six countries from 2012 to 2020, which resulted in Canadian, UK, and Japanese banks demonstrating U-shaped connections between their ESG performance, while Australian and Spanish banks showed positive relationships, yet Turkish banks displayed no association. Size and COVID-19 negatively affected profitability.

According to Alghafes et al. (2024), combined ESG scores demonstrated no substantial influence on GCC Islamic banks during the period from 2010 to 2021. Individual components from the study exhibited different performance effects where social factors strengthened multiple financial indicators, but the governance alone improved return-on-equity, and environmental factors impacted Tobin's Q value.

Cantero-Saiz et al. (2024) revealed that better ESG ratings enhance bank asset quality, yet bank profitability diminishes the effect of ESG-asset quality connections. The EU financial institutions proved to have better connections between ESG-asset quality than non-EU institutions. A study by Nizamuddin et al. (2024) showed that ESG risk scores held a negative connection with financial performance indicators of Indian banks. Accounting measurements had a positive correlation with bank size, but bank leverage generated negative associations with financial indicators.

The ESG initiatives demonstrated a negative influence on Saudi Arabian banking efficiency, although higher DEA scores were recorded for ESG-adjusted efficiency, according to Shaddady and Alnori (2024). Research data verify that ethical commitments create competitive benefits according to stakeholder theory as well as resource-based theory. Loan et al. (2024) determined that ESG commitments showed positive effects on Vietnamese commercial bank performance. Performance success in financial terms was driven by environmental and governance elements, which proved beneficial, yet bank leverage, together with credit growth and non-performing loans, generated adverse effects.

Table 1. Studies included for analysis

S. No.	Research/Study Name	Year of Study	Correlation	Sample Size
1	Birindelli et al. (2018)	2018	0.01	108
2	Buallay (2019)	2019	0.802	2350
3	Al-Jalahma et al. (2020)	2020	–0.183	104
4	Bătae et al. (2020)	2020	0.297	108
5	Khoury et al. (2021)	2021	–0.0455	306
6	Menicucci and Paolucci (2022)	2022	0.004	105
7	Alamsyah and Muljo (2023)	2023	–0.03	656
8	Amara and Benali (2023)	2023	–0.0121	30
9	Isik (2023)	2023	0.151	58
10	Alghafes et al. (2024)	2024	0.01	29
11	Cantero-Saiz et al. (2024)	2024	0.1602	96
12	Nizamuddin et al. (2024)	2024	–0.472	25
13	Shaddady and Alnori (2024)	2024	–0.5078	11
14	Loan et al. (2024)	2024	0.3912	24
15	Islam et al. (2025)	2025	0.13	46
16	Prasad and Mondal (2025)	2025	0.503	28
	Total Sample Size			4084

According to Islam (2025), the ESG factors did not influence profit margins of banks in OIC member countries but lowered their stability rates. The ESG-related profitability improved when competition was reduced, but stability declined in parallel, making regulatory quality immaterial. A study by Prasad and Mondal (2025) indicates that Indian bank operations display larger responses to present-day ESG activities, although private banks execute these strategies better than public banks. Competitive triumph depends on the creation of functional ESG management systems. The summary of the selected studies for the 'Meta-Analysis' is presented in Table 1.

3. RESULTS

3.1. Meta-analysis and forest plot

This meta-analysis, using a random-effects model at a 95% confidence interval, analyzes data from a total of 16 studies aggregating 4,084 sample sizes (refer to Table 2 and Figure 1). The mean effect size is 0.10 correlation for the whole package, with a confidence interval ranging from –0.10 to 0.30, which implies a very small and possibly no effect. The prediction interval of –0.88 to 0.92 shows increased variability, implying negative or positive correlations may be observed in future investigations. The Z-value found in the statistical significance test is 1.05, yielding a one-tailed p-value of 0.146 and a two-tailed p-value of 0.292, which indicates that the effect is not statistically significant. The heterogeneity is considerable (I^2 = 98.76%, Q = 1213.82, $p < 0.001$), showing considerable variation between studies. The $T^2 = 0.474$, further indications of heterogeneity, pointing out that variations in effect sizes exist across studies, not merely due to random error.

The observation of considerable heterogeneity along with an expansive prediction interval indicates the necessity of conducting a publication

Table 2. Meta-analysis model

Model	Random Effects Model	Z-value	1.05
Confidence level	0.95	One-tailed p-value	0.146
Presentation		Two-tailed p-value	0.292
Sort By	Entry number	Number of incl. subjects	4084
Order	Ascending	Number of incl. studies	16
Combined Effect Size		**Heterogeneity**	
Correlation	0.10	Q	1213.82
Confidence interval LL	–0.10	pQ	0.000
Confidence interval UL	0.30	I^2	0.988
Prediction interval LL	–0.88	T^2 (z)	0.474
Prediction interval UL	0.92	T (z)	0.689

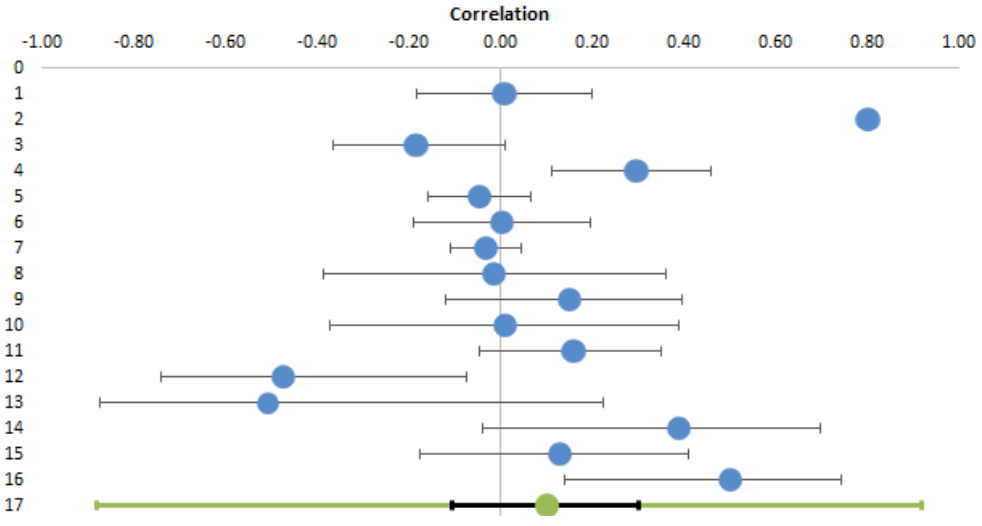

Figure 1. Forest plot

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bias analysis to explore the possible influence of publication bias. The absence of statistical significance suggests caution in interpreting the effect size as meaningful.

3.2. Funnel plot

This funnel plot shows evidence of publication bias and heterogeneity in a meta-analysis in a random-effects model. The weighted statistic combining the effect size Fisher's z-transformed correlation is 0.10, with a standard error of 0.10. The confidence interval ranges from -0.10 to 0.30, while the prediction interval is from –1.38 to 1.59, suggesting that a considerable degree of uncertainty is expressed in possible true effects across all studies (refer to Table 3 and Figure 2).

Heterogeneity showed a highly significant between-study variance (I^2 = 98.76%), indicating that almost all observed variance arises from real differences instead of sampling error. The Q-statistic (1,213.818, $p < 0.001$) confirms high heterogeneity. The estimator T^2 is 0.47, and that of T is 0.69. To explore the publication bias, a trim and fill procedure with no missing studies imputed was performed.

Table 3. Publication bias analysis (funnel plot)

Combined Effect Size	Observed	Heterogeneity	
Correlation (z)	0.10	Q	1213.82
SE (z)	0.10	pQ	0.00
CI Lower limit	–0.11	I^2	0.99
CI Upper limit	0.31	T^2	0.474
PI Lower limit	–1.38	T	0.689
PI Upper limit	1.59	–	–
Combined Effect Size	**Adjusted**	**Trim and Fill**	**On**
Correlation (z)	0.10	Estimator for missing studies	Leftmost Run/Rightmost Run
SE (z)	0.10	Search from the mean	Left
CI Lower limit	–0.11	Number of imputed studies	0
CI Upper limit	0.31	–	–
PI Lower limit	–1.38	–	–
PI Upper limit	1.59	–	–

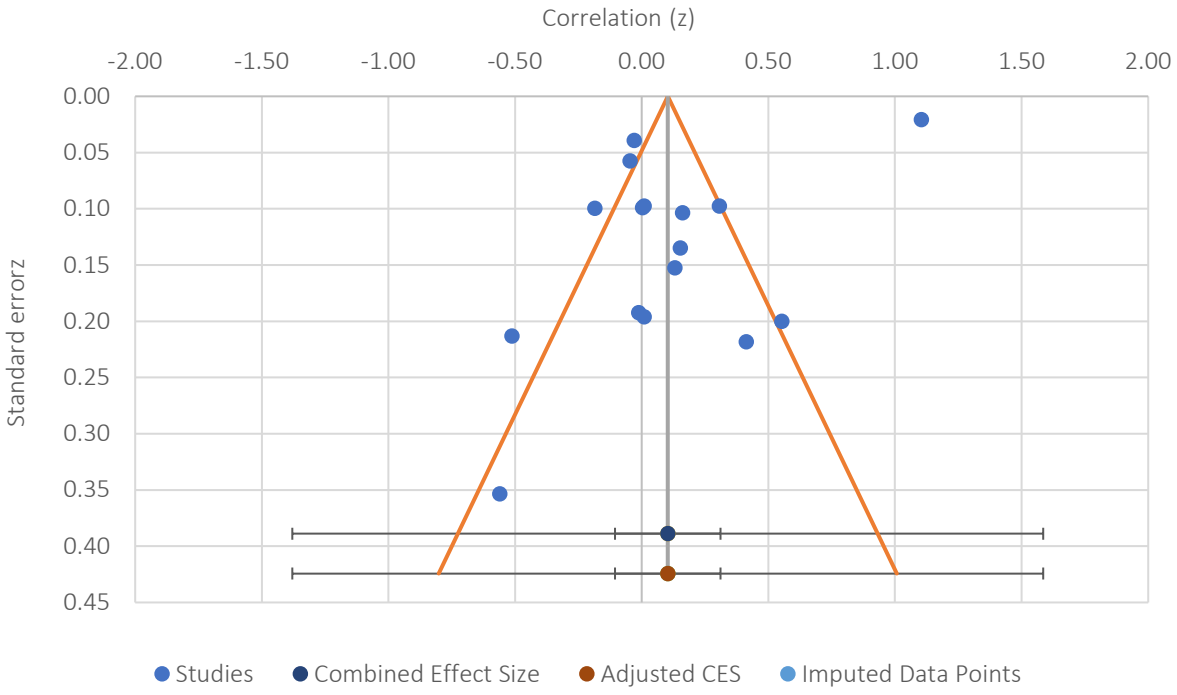

Figure 2. Funnel plot

3.3. Standardized histogram residual

Table 4 presents the distribution of values among predefined bins, exhibiting the observed proportions and expected probabilities. More than half of all the values (50%) belonged to the range of –0.2 to 0.2, which was rather close to its expected probability (0.16). Two adjacent bins (–1 to –0.6 and –0.6 to –0.2) declare that 13% of the values lie within each bin, similar to the expected probability (what appears to be within 0.12 to 0.15) (refer to Figure 3 and Table 4).

In the extremes, either (–∞, –1) or (1, 1.6) only retake zero for the observed proportion, while the expected probability was 8%, indicating something related to the cut-off or the formation is not symmetric. The (1.6, ∞) bin counts 6%. It fits with expectations. As it stands, we have a pretty strong concentration binned around 0, which has a slight skew in a rightward direction since the positive bins carry a slightly larger proportion. Also, the data more or less follow expected probabilities, with minor purviews sufficing in the extremes. A follow-up could investigate the absence of extreme negative values and the possible implications.

Table 4. Bin table (residual histogram)

Bin	Proportion	Probability
–∞; –1.4	0.00	0.08
–1.4; –1	0.00	0.08
–1; –0.6	0.13	0.12
–0.6; –0.2	0.13	0.15
–0.2; 0.2	0.50	0.16
0.2; 0.6	0.13	0.15
0.6; 1	0.06	0.12
1; 1.4	0.00	0.08
1.4; ∞	0.06	0.08

Table 4 provides insights regarding the distributions of effect sizes and heterogeneity without directly confirming any publication bias. However, the "Trim and Fill" method was applied, but no imputed studies were found, suggesting minimal publication bias. The proportion distribution appears somewhat symmetric around 0, with no strong clustering at extreme positive or negative values. The absence of studies in extreme negative bins (–∞ to –1.0) could indicate publication bias, as negative or non-significant results are often underreported. The lack of extreme negative values raises some concern for publication bias, but the Trim and Fill method found no missing studies. Therefore, the heterogeneity seen in this study is only due to the variations among the individual studies and not due to publication bias. Based on the results from the above meta-analysis, we reject the hypothesis (H_1) and conclude that there is no significant positive pooled effect of ESG practices on the financial performance of banks at present.

This meta-analysis was carried out to estimate the combined effect size of ESG on the financial performance of banks using a random-effects model approach. The analysis has 16 studies involving a total of 4,084 subjects, and the findings provide insight into the effect magnitude, the level of disparity, and the probable publication bias. Overall, the effect size is estimated at 0.10, with the standard error (SE) being 0.10. The confidence interval (95% CI: –0.11 to 0.31) indicates that the true effect may even potentially be among these ranges: negative or positive. It would mean that the relationship is going to be weak and not statistically significant. The prediction interval suggests that the

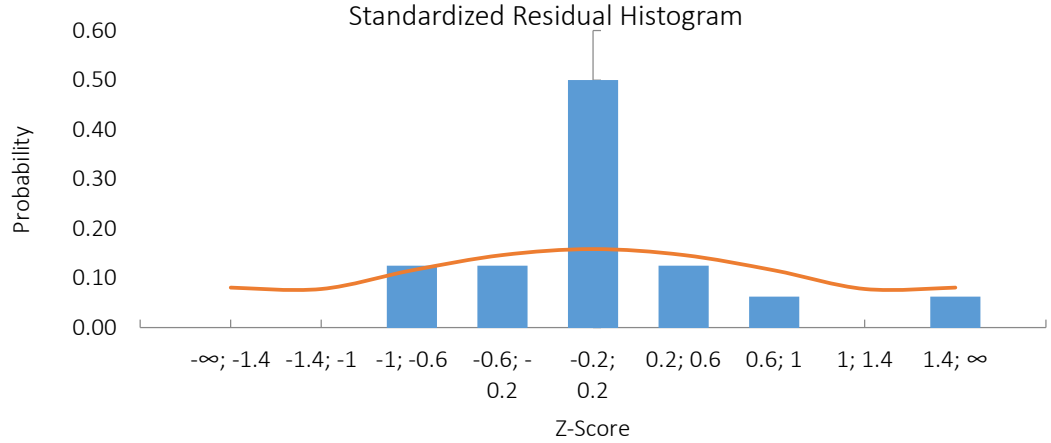

Figure 3. Standardized residual histogram

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existing level of heterogeneity may make it possible for some studies to look for a reasonable cue of a strong effect, while others may zero up, or even sometimes go against it.

A key finding of this meta-analysis is a high degree of heterogeneity among the studies. The Q-statistic (1,213.82, $p < 0.001$) demonstrated that there was more variability between studies than would be expected by chance. The I^2 value of 98.76% shows that almost all variance observed is due to real differences between the studies and is not due to random error. The T^2 value (0.47) further confirms substantial heterogeneity, suggesting that certain characteristics of studies (like sample size, methodology, and variability in the population) influence the effect size. Such a high heterogeneity proves that a single pooled effect will not be very meaningful to understand. Hence, future research is encouraged to explore moderators or subgroup analyses to find any possible factor affecting the study outcomes. For publication bias assessment, two statistical tests were conducted: Egger's regression test and Begg and Mazumdar's rank correlation test.

Egger's Regression Test: The intercept coefficient is –8.32 ($p = 0.10$) and is not significant, meaning there is no strong case for asymmetry of the funnel plot, inferring therefore that smaller studies with no statistically significant results were axiomatically missing from the analysis.

The Begg and Mazumdar Test: The significant Kendall's Tau correlation (0.43, $p = 0.022$) suggests that there may be a certain degree of publication bias. This suggests that selective reporting of statistically significant results may lead to some effect sizes being greatly inflated.

The Trim-and-Fill Method: It was further utilized to evaluate missing studies. Accordingly, there were no studies supplied; therefore, the lost data may not be very serious. Nevertheless, the presence of contrasting outcomes from Egger's and Begg's tests suggests that some amount of publication bias cannot be dismissed, and further analyses would need to consider a more inclusive approach by including unpublished or grey literature, thereby making for a balance in the data set.

In practical terms, the weak and statistically non-significant effect size suggests that the relationship described may not be sufficiently strong to allow for real-world decision-making. Furthermore, this high degree of heterogeneity suggests that the effect is very context-specific, such that generalizing the findings would be inappropriate without consideration of the specific study characteristics. Future researchers should take a more international approach that includes a wider range of studies, including unpublished research, hence protecting against biased conclusions. More so, the variation of the prediction interval demonstrates that more investigation into potential moderators would be necessary since effects vary considerably across studies. Future studies should test these hypotheses by including moderating analyses and biases that might exist in the data.

CONCLUSION

The aim of this research was to analyze the net impact of environmental, social, and governance (ESG) practices on the financial performance of banks. Through literature review, computation of the net impact of ESG on key financial indicators, and analysis of the statistical influence of such practices, the research seeks to establish whether ESG practices by banks have a positive impact on their financial performance. This study attempted to reveal the holistic effect of ESG scores on a bank's financial performance. The findings of this meta-analysis revealed that though the studies at the individual levels had significant effects (both positive and negative), there is no pooled significant effect of ESG on the financial performance of banks. Conceptually, environmental, social, and governance (ESG) initiatives/practices may affect ROA or ROE positively or negatively. The meta-analysis of the studies also reported a small and statistically not significant overall effect size, but with high heterogeneity across the individual studies. This reveals high variability of outcome and implies that investigation of potential moderating variables to account for the conditions under which the effects found would change or be increased is particularly relevant. So, though many banks claim investments in ESG, the study shows no

significant outcomes from them. It can be positive due to better operational efficiency and cost reduction investment. From an investor's viewpoint, entities that operate at the intersection of sustainability get lower financing through avenues such as ESG funding and impact investments. On the other hand, it may influence negatively due to heavy upfront investments. Several ESG projects will require heavy income in their initial years, thus creating a direct impact on short-term ROA.

The study shows relatively high heterogeneity, further demonstrating that several factors may influence the effect across studies and that uniform application of the findings may not be appropriate. Hence, the practitioners and policymakers should be cautious in their universal applicability because the effect varies with the characteristics of the study, such as the population, methodology, or setting. Future studies should attempt to identify moderators influencing the relationships so that they can offer clearer guidelines for practical applications. For instance, should specific studies remain in the underreported realm, particularly those that are not statistically significant or carry negative findings, this leads to an overestimation of the true effect. Furthermore, it is recommended that researchers and interested parties support the inclusion of unpublished or grey literature in their considerations. Overall, while the meta-analysis provides insights, its variability and the possible bias are reasons for conducting further research before making strong practical conclusions.

This meta-analysis brings to life huge insights but also raises paramount heterogeneity and possible publication bias. This indicates that in real-world applications, the effect studied is probably weak and should not be relied on for any major decision-making. Hence, the varied results of the studies suggest moderators should be detected, subgroup analyses should be performed, and this work could become consistent by the inclusion of a more varied set of studies after that.

AUTHOR CONTRIBUTIONS

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