THE RELATIONSHIP BETWEEN SUSTAINABILITY REPORTING AND FINANCIAL PERFORMANCE UNDER A META-ANALYSIS

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Abstract

The relationship between sustainability reporting (SR) and corporate financial performance (CFP) has been a longstanding and debated topic in academic research (Orlitzky et al., 2003). However, past empirical studies have yielded varying results. This study aims to systematically and quantitatively assess the link between SR and CFP through a meta-analysis (MA) approach. Using 115 effect sizes from 30 studies, the analysis indicates a positive and significant overall relationship between SR and CFP, reinforcing the idea that SR contributes to improved financial performance. Additionally, the study explores the causal connection between SR and CFP, supporting various related theories. The MA also reveals that different measurement methods for SR and CFP account for some of the variability in the corporate social responsibility (CSR)-CFP relationship. Lastly, the research examines how the environmental context influences the SR-CFP link, finding that the relationship is stronger for firms in developing economies compared to those in developed economies.

Keywords: Sustainable Reporting, Financial Performance, Social Responsibility, Meta-Analysis

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1. INTRODUCTION

The increasingly competitive and dynamic market is placing unprecedented pressure on companies to not only succeed but also sustain their success in the future. In recent years, sustainability reporting (SR) has garnered significant attention, as firms, investors, and consumers focus more on sustainability (Ameer & Othman, 2012; Van Linh et al., 2022). Companies are now expected to move beyond short-term financial gains and focus on long-term economic, environmental, and social sustainability (Haffar & Searcy, 2017). Developing strategies for improvement and transforming companies into responsible organizations that prioritize environmental and social dimensions has become an essential requirement for staying competitive in future markets (Busse, 2016). Sustainability is defined as meeting present needs without compromising the ability of future generations to meet their own needs (Hahn & Kühnen, 2013). Corporate sustainability extends beyond financial performance to include environmental and social aspects (Albertini, 2013). As companies seek to stay relevant in changing markets, they recognize that focusing solely on

financial aspects is no longer sufficient (Dixon-Fowler et al., 2013). Building a successful business increasingly relies on how well a company positions itself for sustainable development that balances finance, the environment, and human progress (Shank & Shockey, 2016).

Sustainability performance and disclosure are becoming increasingly crucial to a company's competitive success. However, the term "sustainability" can mean different things to different stakeholders, each with their own interests. For example, environmentalists may prioritize reducing air pollution, conserving water, and recycling waste. The literature on the relationship between SR and corporate financial performance (CFP) presents conflicting results. Previous studies have shown that the findings on this relationship are too varied to reach a clear conclusion. Ullmann (1985) notes that these conflicting results may be due to factors such as differences in sample sizes, industrial contexts, inconsistent measurements of SR and CFP, and varying research methodologies, data collection, and analysis methods. Most studies on the SR-CFP relationship have used market value or accounting value measures to evaluate financial performance. To address these concerns, this study employs meta-analysis (MA) to better understand the factors that influence the SR-CFP relationship. MA is a statistical technique used to combine findings from multiple studies on the same topic (Hunter & Schmidt, 2004; Dang & Pham, 2022), often applied when previous studies yield conflicting empirical results. For instance, Orlitzky et al. (2003) conducted an MA of 52 studies and found that social responsibility, and to a lesser extent environmental responsibility, could improve future financial performance, while a firm's reputation plays an important role in the corporate social performance (CSP)-CFP relationship.

In another MA, Lu and Taylor (2016) analyzed 198 studies, representing a total of 31,514 observations, and found that SR can enhance financial performance, particularly over the long term. Environmental sustainability was found to have a stronger positive impact on SR-CFP relationships compared to social sustainability. Additionally, CSP was more strongly linked to accounting-based financial metrics than market-based ones. Studies conducted before 2000 and those focused on firms outside the U.S. tended to show more positive effects in the SR-CFP relationship. Similarly, Wang et al. (2016) explored the corporate social responsibility (CSR)-CFP relationship using a systematic quantitative review, based on 119 influence scales from 42 studies, and confirmed a significant positive relationship, supporting the view that CSR can enhance performance. This study also explored the causal relationship between CSR and CFP, supporting the stakeholder theory. MA results indicated that the measurement strategies for CSR and CFP account for several aspects of the CSR-CFP relationship. Furthermore, Alshehhi et al. (2018) reviewed the SR-CFP relationship and noted that while the subject has gained more attention, it remains difficult to draw a consensus, with 78% of studies reporting a positive relationship.

Why is MA necessary? While previous studies like those by Orlitzky et al. (2003), Wang et al. (2016), and Lu and Taylor (2016) explored the regulatory effectiveness of CSR measures, this paper expands on these by examining different financial performance metrics, a comprehensive approach to SR measurement, and the bidirectional SR-CFP and CFP-SR relationships. Additionally, it addresses Ullmann's (1985) concerns by considering sample characteristics (e.g., sample size, SR and CFP measures, and country context). This study also incorporates the latest research on SR, which has grown significantly, especially in developing countries. This research contributes to new insights into the SR-CFP relationship through an MA, providing a more thorough review of past studies. Unlike traditional narrative reviews, which may overlook sampling and measurement errors, MA accounts for variability across studies, offering more reliable conclusions.

The rest of this paper is structured as follows. Section 2 presents the theoretical framework, literature review, and hypotheses. Section 3 outlines the research methodology. Section 4 discusses the results. Section 5 provides the conclusion.

2. THEORETICAL FRAMEWORK, LITERATURE REVIEW, AND HYPOTHESES DEVELOPMENT

2.1. Theoretical framework

Ullmann (1985) emphasizes the need for a theory of firm social performance, arguing that inconsistent findings on the relationship between information disclosure on social performance, social performance itself, and the economic efficiency of U.S. publicly traded companies are due to various factors. Among the theories frequently used in previous research, three have garnered significant attention from investors: agency theory, legitimacy theory, and stakeholder theory.

Agency theory, as proposed by Jensen and Meckling (1976), suggests that one of the primary roles of managers is to align the interests of the firm with those of its shareholders. Friedman (2007) applied agency theory to CSR performance, arguing that involvement in CSR indicates a conflict between the interests of managers and shareholders. According to Friedman (2007), CSR initiatives are often driven by managers' personal goals in areas such as social, economic, political, and professional ambitions. From this perspective, investing in CSR should ideally improve firm efficiency from a social standpoint. Friedman (2007) further argued that spending on CSR is essentially wasting other people's money and does not significantly benefit the firm overall. This theory posits that environmental costs, like reducing pollution or emissions, raise production costs, thereby diminishing efficiency. Several studies, including those by Jaggi and Freedman (1992) and King and Lenox (2001), have tested this theory, finding a negative relationship between environmental activities and economic performance.

Stewardship theory, introduced by Davis (1973), argues that businesses are entrusted with power by society, and those who misuse this power in ways deemed irresponsible by society risk losing it. This theory asserts that organizations must continuously operate within the norms and limits defined by society (Deegan, 2002). According to stewardship theory, firms have social and legal responsibilities to operate in a socially responsible manner to maintain their legitimacy (Cong & Freedman, 2011).

Stakeholder theory, proposed by Freeman (1984), explores the relationships between a company and its external stakeholders. Freeman (1984) defines a stakeholder as any individual or group that can influence or be affected by a company's objectives. This theory is widely regarded as an effective framework for understanding managerial behavior.

2.2. Literature review and hypotheses development

This section provides an overview of the mixed empirical results on the relationship between SR and CFP. Many studies have explored this relationship using SR as the dependent variable and CFP as the independent variable (McWilliams & Siegel, 2000), while others reverse the roles (Arayssi et al., 2016). The results from these studies have been inconsistent. Some studies find a positive correlation between SR and CFP (Orlitzky et al., 2003), while others focus on the connection between environmental performance and CFP. One group of researchers argues that environmental performance enhances financial performance, while another group suggests that financial performance negatively correlates with environmental performance, such as pollution levels. Given the varied findings, this study aims to investigate the SR-CFP relationship by exploring four key aspects: 1) the impact of SR on financial performance, 2) the impact of financial performance on SR, 3) the relationship between SR and CFP, and 4) the determinants influencing this relationship.

2.2.1. The impact of sustainability reporting on financial performance

Several studies have yielded mixed results regarding the relationship between social responsibility and performance, showing negative, positive, or no correlations (Nelling & Webb, 2009). These studies can be categorized into three groups.

The first group suggests an inverse relationship between SR and performance (Friedman, 2007), (Rhou et al., 2016) emphasize that businesses should focus on utilizing their resources to increase profits for shareholders, and studies in this group argue that emphasizing SR may negatively affect CFP. Effective communication in SR activities is important for stakeholders.

The second group, drawing on Freeman's (1984) stakeholder theory, finds a positive relationship between SR and CFP (McWilliams & Siegel, 2000; Hoang et al., 2019). These studies argue that firms should consider various stakeholders, such as customers, employees, and communities when executing social activities, which can boost CFP by enhancing revenue, company image, brand, and reputation.

The third group posits that there is no clear relationship between SR and CFP (Teoh et al., 1999), suggesting that too many other factors influence performance (Asuquo et al., 2018).

2.2.2. The impact of financial performance on sustainability reporting

According to profit motive theory, firms investing in sustainable development activities can expect positive changes in future financial results. For instance, investing in sustainability can improve a firm's reputation with the community, potentially increasing revenue, and market share, attracting better employees, or reducing legal conflicts. Thus, a firm's value is linked to its commitment to sustainable development. Several studies, such as Holbrook (2010) and Arayssi et al. (2016), support the view that higher CFP leads to increased disclosure of environmental, social, and governance (ESG) information. This positive influence is reflected in the higher level of information disclosure in sustainability reports.

2.2.3. The relationship between sustainability reporting and financial performance

Regarding the bidirectional relationship between SR and CFP, some studies find a positive correlation (Orlitzky et al., 2003), while others find no correlation (McWilliams & Siegel, 2000; Dang et al., 2021), and some even suggest a negative relationship (Lima Crisóstomo et al., 2011). Based on the literature review, the following hypotheses are proposed:

H1: There is a positive relationship between sustainability reporting (SR) and corporate financial performance (CFP).

H2: There is a positive relationship between corporate financial performance (CFP) and sustainability reporting (SR).

2.2.4. Factors influencing the relationship between sustainability reporting and financial performance

Approaches to measuring financial performance

Wood and Jones (1995) highlight potential mismatches in stakeholder expectations due to the different metrics used to assess financial performance, each with specific biases. Three primary CFP metrics have been used: 1) accounting-based measures (return on assets, ROA or return on equity, ROE), 2) market-based measures (price-to-earnings ratio or Tobin's Q), and 3) other financial performance indicators like market share and profitability. Based on these variations, we hypothesize:

H3: Different corporate financial performance (CFP) measurement approaches will lead to systematically different results in empirical studies.

Sustainability reporting approach

SR is complex and multidimensional, integrating principles, processes, and policies related to social issues (Wartick & Cochran, 1985). Measurement challenges in SR contribute to uncertainty in understanding the SR-CFP relationship (Waddock & Graves, 1997). This MA will test whether different SR measurement approaches lead to systematic differences in study results. Thus, we hypothesize:

H4: Different sustainability reporting (SR) measurement approaches lead to systematically different results in empirical studies.

Institutional environment

Institutional differences between developed and developing economies may influence how stakeholders affect corporate managers (Campbell, 2007). In developed economies, firms are more likely

to benefit from regulatory support for sustainable practices, leading to enhanced CFP. In contrast, firms in less developed economies may not experience such benefits, as institutional systems and regulations may be weaker. Based on this reasoning, we propose:

H5: The relationship between sustainability reporting (SR) and corporate financial performance (CFP) is stronger for firms in developed economies than for those in developing economies.

3. RESEARCH METHODOLOGY

3.1. Data collection

We identified empirical studies that examine the relationship between SR and CFP. To gather as many relevant articles as possible, we conducted a keyword search across various electronic databases for both published and unpublished articles. The databases searched included Google Scholar, ProQuest, EBSCO, Science Direct, Emerald, JSTOR, Springer, and Scopus. The search terms used were: "sustainability reporting", "development sustainability reporting", "social responsibility", "business efficiency", "financial performance", and "corporate value". After collecting relevant papers, we evaluated each study's relevance to our focus on the SR-CFP relationship to determine its eligibility for inclusion in the MA. To be eligible, a study had to meet three criteria: 1) it must provide specific results on the SR-CFP relationship, 2) it must be available in full text online, and 3) it must report a correlation (r) or equivalent statistic, such as a t-value, p-value, beta-factor, or Chi-squared (χ^2) value, which are necessary for the MA process. Studies were selected based on these criteria, and only empirical studies reporting sample sizes and statistical results (e.g., r, univariate F, t, χ^2) that allow calculation of correlation coefficients using the formulas provided by (Hunter & Schmidt, 2004) were included. After completing the data retrieval process, we compiled a dataset of 115 effect sizes from 30 studies, as detailed in Table A.1 (see Appendix). To minimize coding errors, we developed an encryption protocol to track the information extracted from each study. Coders recorded data on key variables, including effect size, sample size, and study characteristics.

3.2. Processing techniques

We conducted the MA following the guidelines provided by (Hunter & Schmidt, 2004). Given the time-consuming nature of the analytical process, we opted for MA. First, we converted the reported statistics into a general effect size. To address potential bias in the distribution of sample correlation coefficients, we transformed the correlation into Fisher's Z-coefficient using the formula $Y_i = 0.5 \times log\left(1 + r_i/(1 - r_i)\right)$. Then, we averaged and weighed the z-coefficients using the formula $V_i = 1/(N - 3)$. Two models were considered: the fixed effects (FE) model and the random effects (RE) model. The FE model assumes that effect sizes are the same across all studies, with observed differences attributed to sampling errors. In contrast, the random effects model allows for variation in effect sizes across studies, with observed differences stemming from both actual variance and sampling error (Hedges & Vevea, 1998). The random effects model is generally preferred, and we conducted uniformity tests to determine which model to use. However, in this study, we present results based on both FE and RE models, with discussion and evaluation primarily focused on the RE model.

4. RESULTS AND DISCUSSION

Table 1 presents key metrics for each paired relationship, including the number of effect sizes, cumulative sample size, corrected correlations, standard error, and 95% confidence intervals. Supporting *H1*, a significant positive correlation between SR and CFP was found ($r = 0.24$, $p < 0.001$). Additionally, the I_2 index, which measures the proportion of variance due to heterogeneity among studies (Higgins & Thompson, 2002), is reported. Generally, I_2 values of 25%, 50%, and 75% indicate low, medium, and high heterogeneity, respectively. In this case, I_2 is 81.0%, indicating high heterogeneity in conclusions about the SR-CFP relationship. The analysis also explored the causal direction between SR and CFP. As shown in the second row of Table 1, primary studies support stakeholder theory. The corrected correlation between prior SR and subsequent CFP is 0.25 ($p < 0.001$, $n = 24{,}562$), confirming *H1*. Similarly, the reverse relationship (CFP to SR) also shows a positive correlation ($r = 0.12$, $p < 0.001$, $N = 3{,}574$). These findings suggest a bidirectional positive relationship between SR and CFP, with SR's influence on CFP being stronger. This aligns with the results of Wang et al. (2016) and Lu and Taylor (2016).

Table 2 highlights that the relationship between SR and CFP varies depending on how CFP is measured. The significant moderating effect of CFP (Prob. > F = 0.0264 < α) supports the idea that differences in previous findings are attributable to measurement variations, confirmed by a Bonferroni test showing a difference between market value-based CFP measures and other approaches. Across all measurement strategies, the SR-CFP relationship remains significantly positive. Notably, market-based measures of CFP ($r = 0.32$, $p < 0.0001$) show a stronger correlation with SR compared to accounting-based ($r = 0.21$, $p < 0.0001$) or other methods ($r = 0.22$, $p < 0.0001$), leading to the acceptance of *H3*.

To examine how different SR measurement approaches impact the SR-CFP relationship, the sample was split into two subgroups: a general approach and a subset approach. The Pr (|T| > |t|) = 0.5809 > 0.05 suggests that H_0 is accepted, indicating significant differences in the SR measurement approaches. For the 57 effect sizes using the general SR measurement, the corrected r is 0.25 ($p = 0.0000$). For the 58 effect sizes using an aspect-specific measurement, the corrected r is 0.23 ($p = 0.0000$). These results indicate that the relationship between SR and CFP is positive across all SR measurement strategies, supporting *H4*.

The relationship between SR and CFP was also examined for firms from developed versus developing economies. Studies were categorized into two groups based on the economic context: advanced economies and developing economies. The test results (Prob. > Chi2 = 0.007 < 0.05) reveal significant differences in the SR-CFP relationship across these groups. Research based on developing economies shows a stronger relationship ($r = 0.29$)

compared to developed economies (r = 0.19) and mixed samples (r = 0.20), leading to the acceptance of *H5*, though this contradicts findings by Wang et al. (2016).

An additional analysis of the SR-CFP relationship, based on a database of 30 samples, is presented in Table A.2 (see Appendix). The overall correlation between SR and CFP is positive (r = 0.29), with a 95% confidence interval of [0.21, 0.36]. The I_2 value of 87.53%, according to Higgins and Thompson (2002), indicates high heterogeneity. The studies were further divided into two groups: four studies on the effects of CFP on SR, and 26 studies on the effects of SR on CFP. Results in Table A.3 (see Appendix) show a positive relationship in both directions, with SR having a stronger effect on CFP.

To assess publication bias, we know that when a result shows a negative result, the work has little chance of being published in prestigious journals, because the editors do not like publishing articles like that. In contrast, a study with a positive outcome is a study more likely to appear in scientific journals than studies with negative results. Figure A.1 (see Appendix), which presents the results of the funnel diagram and the Egger test, illustrates that if in the absence of publication bias trends and minor research effects, the graph of studies should resemble a figure of a symmetric inversion funnel; chart shows that there are some studies missing in the lower left part of the graph, which makes it look asymmetrical; test result Egger Pr(z) = 0.000 < 0.05, suggesting that there is bias in publishing. To clarify this issue, of the 30 studies divided into 2 groups, Group 0 are the studies published in non-ISI /Scopus journals and seminars. Group 1 is research published in prestigious international journals. Table A.4 and Table A.5 (see Appendix) present the summary results when grouped based on the published index, the results show that the studies in Group 0, have a higher correlation coefficient with higher r = 0.35; Group 1 with r = 0.27, and the coefficient I_2 = 92.09% of Group 0, showing that the publication bias is also higher.

Table 1. Findings of the relationship between SR and CFP

Relationship	*Model*	*Fisher Z*	*r*	*SE*	*95% CI*	*z score*	*p-value*	*Heterogeneity*	*Number of effect sizes (k)*	*Total sample size (N)*
Overall	FEM	0.17	0.17	0.01	[0.16, 0.18]	28.548	0.0000	I^2 = 81.0%, Chi^2 = 597.423, df = 114	28136	115
	REM	0.24	0.24	0.02	[0.21, 0.27]	14.573	0.0000	I^2 = 81.0%, Tau^2 = 0.018	28136	115
Impact of SR on FP	FEM	0.18	0.18	0.01	[0.17, 0.19]	28.227	0.0000	I^2 = 81.0%, Chi^2 = 558.674, df = 105	24562	106
	REM	0.26	0.25	0.02	[0.22, 0.28]	14.272	0.0000	I^2 = 81.0%, Tau^2 = 0.019	24562	106
Impact of FP on SR	FEM	0.1	0.1	0.02	[0.07, 0.13]	6.114	0.0000	I^2 = 59.0%, Chi^2 = 19.615, df = 8	3574	9
	REM	0.12	0.12	0.03	[0.06, 0.19]	3.831	0.00013	I^2 = 59.0%, Tau^2 = 0.004	3574	9

Source: Authors' compilation.

Table 2. Findings based on CFP measures

Measuring financial performance method	*Model*	*Fisher Z*	*r*	*SE*	*95% CI*	*z score*	*p-value*	*Heterogeneity*	*Number of effect sizes (k)*	*Total sample size (N)*
Accounting measure	FEM	0.16	0.16	0.01	[0.15, 0.18]	21.827	0.0000	I^2 = 80.0%, Chi^2 = 302.872, df=62	17742	63
	REM	0.22	0.21	0.02	[0.18, 0.25]	10.722	0.0000	I^2 = 80.0%, Tau^2=0.014	17742	63
Market measure	FEM	0.22	0.21	0.01	[0.19, 0.24]	17.087	0.0000	I^2 = 83.0%, Chi^2 = 173.86, df = 30	6358	31
	REM	0.34	0.32	0.04	[0.26, 0.39]	8.737	0.0000	I^2 = 83.0%, Tau^2 = 0.025	17742	63
Other measures	FEM	0.13	0.13	0.02	[0.1, 0.16]	8.169	0.0000	I^2 = 80.0%, Chi^2 = 100.575, df = 20	4036	21
	REM	0.22	0.22	0.04	[0.14, 0.3]	5.157	0.0000	I^2 = 80.0%, Tau^2 = 0.024	17742	63

Source: Authors' compilation.

Table 3. Findings according to SR measurement approach

Approach to measuring SR	*Model*	*Fisher Z*	*r*	*SE*	*95% CI*	*z score*	*p-value*	*Heterogeneity*	*Number of effect sizes (k)*	*Total sample size (N)*
Overall	FEM	0.15	0.14	0.01	[0.12, 0.17]	12.86	0	I^2 = 74.0%, Chi^2 = 213.944, df = 56	8008	57
	REM	0.26	0.25	0.03	[0.2, 0.3]	9.298	0	I^2 = 74.0%, Tau^2 = 0.022	8008	57
Aspects	FEM	0.18	0.18	0.01	[0.17, 0.19]	25.632	0	I^2 = 85.0%, Chi^2 = 376.11, df = 57	20128	58
	REM	0.23	0.23	0.02	[0.19, 0.27]	11.142	0	I^2 = 85.0%, Tau^2 = 0.017	20128	58

Source: Authors' compilation.

Table 4. Findings based on research locations

Research locations	*Model*	*Fisher Z*	*r*	*SE*	*95% CI*	*z score*	*p-value*	*Heterogeneity*	*Number of effect sizes (k)*	*Total sample size (N)*
Developed countries	FEM	0.17	0.17	0.01	[0.15, 0.19]	16.813	0.0000	I^2 = 72.0%, Chi^2 = 245.362, df = 69	9449	70
	REM	0.3	0.29	0.03	[0.24, 0.34]	11.571	0.0000	I^2 = 72.0%, Tau^2 = 0.021	9449	70
Developing countries	FEM	0.14	0.14	0.01	[0.12, 0.16]	12.913	0.0000	I^2 = 82.0%, Chi^2 = 95.443, df = 17	8352	18
	REM	0.2	0.19	0.03	[0.14, 0.25]	6.617	0.0000	I^2 = 82.0%, Tau^2 = 0.011	8352	18
Developed and developing countries	FEM	0.19	0.19	0.01	[0.17, 0.21]	19.4	0.0000	I^2 = 89.0%, Chi^2 = 245.875, df = 26	10435	27
	REM	0.2	0.2	0.03	[0.14, 0.26]	6.357	0.0000	I^2 = 89.0%, Tau^2 = 0.023	10435	27

Source: Authors' compilation.

5. CONCLUSION

This study uses MA to investigate the relationship between SR and CFP. By synthesizing the findings from 30 empirical studies on the SR-CFP link, the research supports the widely accepted view that SR improves CFP. Additionally, the study explores the direction of causality, finding that previous SR positively correlates with subsequent financial performance, supporting stakeholder theory. The overall analysis shows that corporate sustainability positively impacts financial performance in both directions, particularly over the long term. This suggests that companies focused on SR are likely to see higher financial efficiency in the long run, which may encourage managers to invest in SR initiatives even if they do not result in immediate profits.

Over time, SR studies have become more robust, incorporating stronger theoretical frameworks, more consistent practices, and improved controls for variables previously overlooked. The MA review, combined with in-depth discussions and recommendations for future research, offers valuable insights into theoretical development, research design, and experimental analysis in the field. This review aims to enhance and clarify the academic understanding of SR and its role in improving financial performance.

The subgroup analysis results confirmed that the heterogeneity in the SR-CFP relationship could stem from differences in how SR and CFP are measured. The empirical evidence suggests that market-based measures of CFP are more effective in demonstrating the SR-CFP relationship compared to other metrics. Another subgroup analysis, focusing on different SR measurement approaches, found that aspect-specific SR metrics are highly correlated with SR performance. The final MA, which considered the moderating effects of the environmental context, revealed that the SR-CFP relationship is stronger for firms from developing economies than for those in developed economies. In addition, the study analyzed data from 30 studies, confirming the positive SR-CFP relationship and addressing publication bias in the literature.

However, the study only included 30 articles with data on sustainability and firm performance. Future research could expand sample size and scope, examining factors like sustainability and corporate governance disclosures to assess their impact on sustainability performance.

In summary, this research contributes to the existing body of knowledge on business sustainability by conducting a thorough investigation of various SR and CFP measurement methods. It also provides a detailed examination of the sample characteristics and compares different approaches used in previous literature through MA.

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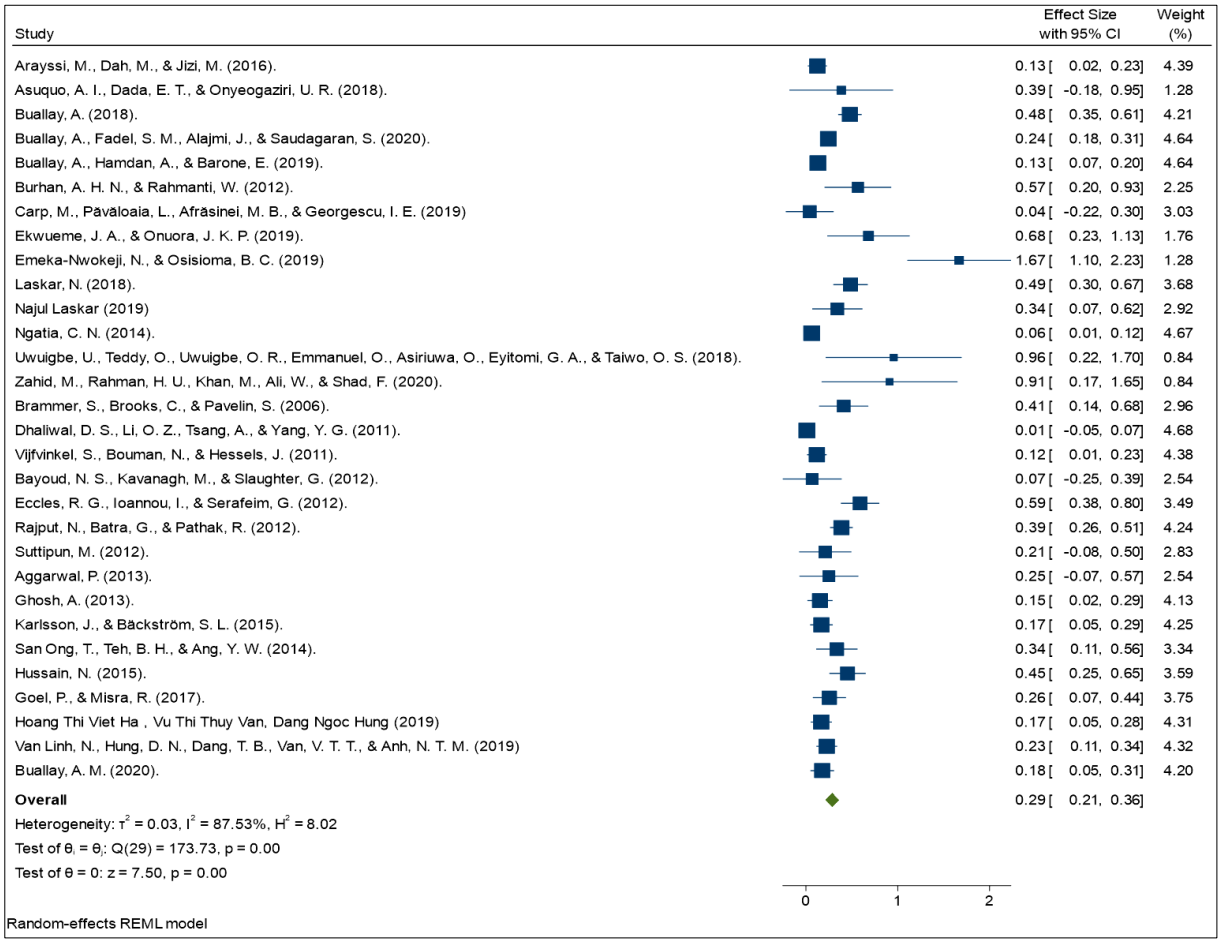
APPENDIX

Table A.1. Articles/reports used in researching the relationship between sustainability reports and financial performance

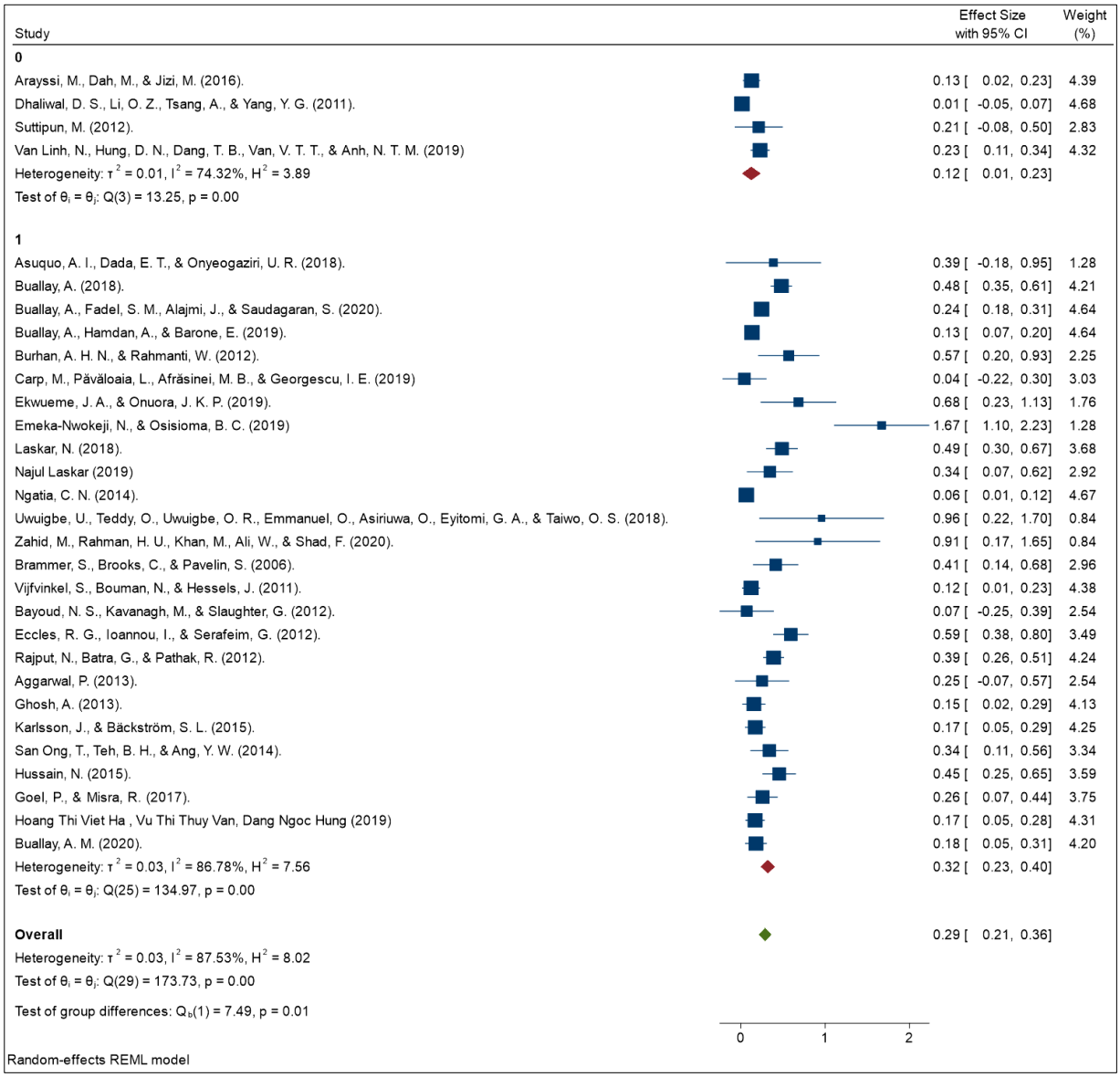
No.	*Authors*	*Names*	*Journals*
1	Arayssi et al. (2016)	Women on boards, sustainability reporting and firm performance	*Sustainability Accounting, Management and Policy Journal*
2	Asuquo et al. (2018)	The effect of sustainability reporting on corporate performance of selected quoted brewery firms in Nigeria	*International Journal of Business & Law Research*
3	Buallay (2019)	Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector	*Management of Environmental Quality*
4	Buallay et al. (2021)	Sustainability reporting and bank performance after financial crisis: Evidence from developed and developing countries	*Competitiveness Review*
5	Buallay (2020a)	Sustainability reporting and firm's performance: Comparative study between manufacturing and banking sectors	*International Journal of Productivity and Performance Management*
6	Burhan and Rahmanti (2012)	The impact of sustainability reporting on company performance	*Journal of Economics, Business, and Accountancy Ventura*
7	Carp et al. (2019)	Is sustainability reporting a business strategy for firm's growth? Empirical study on the Romanian capital market	*Sustainability*
8	Ekwueme and Onuora (2019)	Sustainability accounting and stock performance of quoted consumer goods manufacturing firms	*Journal of Global Accounting*
9	Emeka-Nwokeji and Osisioma (2019)	Sustainability disclosure and market value of firms in emerging economy: Evidence from Nigeria	*European Journal of Accounting, Auditing and Finance Research*
10	Laskar (2018)	Impact of corporate sustainability reporting on firm performance: An empirical examination in Asia	*Journal of Asia Business Studies*
11	Laskar (2019)	Does sustainability reporting enhance firms profitability? A study on select companies from India and South Korea	*Indian Journal of Corporate Governance*
12	Ngatia (2014)	Exploring sustainability reporting for financial performance of selected companies listed at the Nairobi securities exchange in Kenya	*International Academic Journal of Economics and Finance*
13	Uwuigbe et al. (2018).	Sustainability reporting and firm performance: A bi-directional approach	*Academy of Strategic Management Journal*
14	Zahid et al. (2020)	Addressing endogeneity by proposing novel instrumental variables in the nexus of sustainability reporting and firm financial performance: A step-by-step procedure for non-experts	*Business Strategy and the Environment*
15	Brammer et al. (2006)	Corporate social performance and stock returns: UK evidence from disaggregate measures	*Financial Management*
16	Dhaliwal et al. (2011)	Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting	*Accounting Review*
17	Vijfvinkel et al. (2011)	Environmental sustainability and financial performance of SMEs	Research paper
18	Bayoud et al. (2012)	Corporate social responsibility disclosure and corporate reputation in developing countries: The case of Libya	*Journal of Business and Policy Research*
19	Eccles et al. (2012)	The impact of corporate sustainability on organizational processes and performance	Working paper
20	Rajput et al. (2012)	Linking CSR and financial performance: An empirical validation	*Problems and Perspectives in Management*
21	Suttipun (2012)	Triple bottom line reporting in annual reports: A case study of companies listed on the stock exchange of Thailand	*Asian Journal of Finance & Accounting*
22	Aggarwal (2013)	Impact of sustainability performance of company on its financial performance: A study of listed Indian companies	*Global Journal of Management and Business Research Finance*
23	Ghosh (2013)	Corporate sustainability and corporate financial performance: The Indian context	Working paper
24	Karlsson and Bäckström (2015)	Corporate sustainability and financial performance. The influence of board diversity in a Swedish context	Thesis
25	San Ong et al. (2014)	The impact of environmental improvements on the financial performance of leading companies listed in Bursa Malaysia	*International Journal of Trade, Economics, and Finance*
26	Hussain (2015)	Impact of sustainability performance on financial performance: An empirical study of global fortune (N100) firms	Working paper
27	Goel and Misra (2017)	Sustainability Reporting in India: Exploring Sectoral Differences and Linkages with Financial Performance	*Vision: The Journal of Business Perspective*
28	Hoang et al. (2019)	Impact of social responsibility information disclosure on the financial performance of enterprises in Vietnam	*India Journal of Finance*
29	Linh et al. (2019)	The effects of business efficiency to disclose information of sustainable development	*Asian Economic and Financial Review*
30	Buallay (2020b)	Sustainability reporting and banks performance: Comparison between developed and developing countries	*World Review of Entrepreneurship, Management and Sustainable Development*

Table A.2. The forest plot chart presenting the relationship between sustainability reporting and overall financial performance



Source: Authors' compilation.

Table A.3. A forest plot chart presenting a trend-oriented relationship between financial performance and sustainability



Note: 0 — CFP-SR relationship; 1 — SR-CFP relationship.
Source: Authors' compilation.

Figure A.1. Funnel plot chart and Egger testing presenting the relationship between sustainability reporting and financial performance

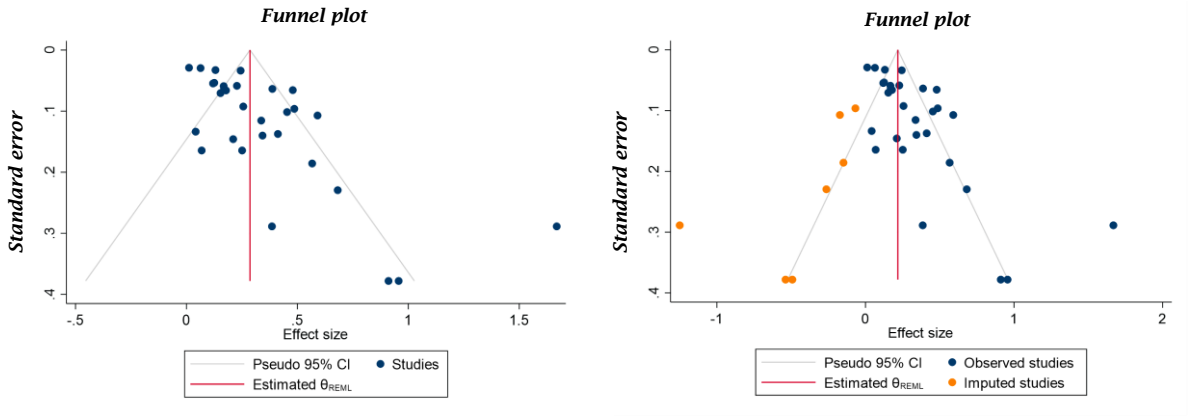
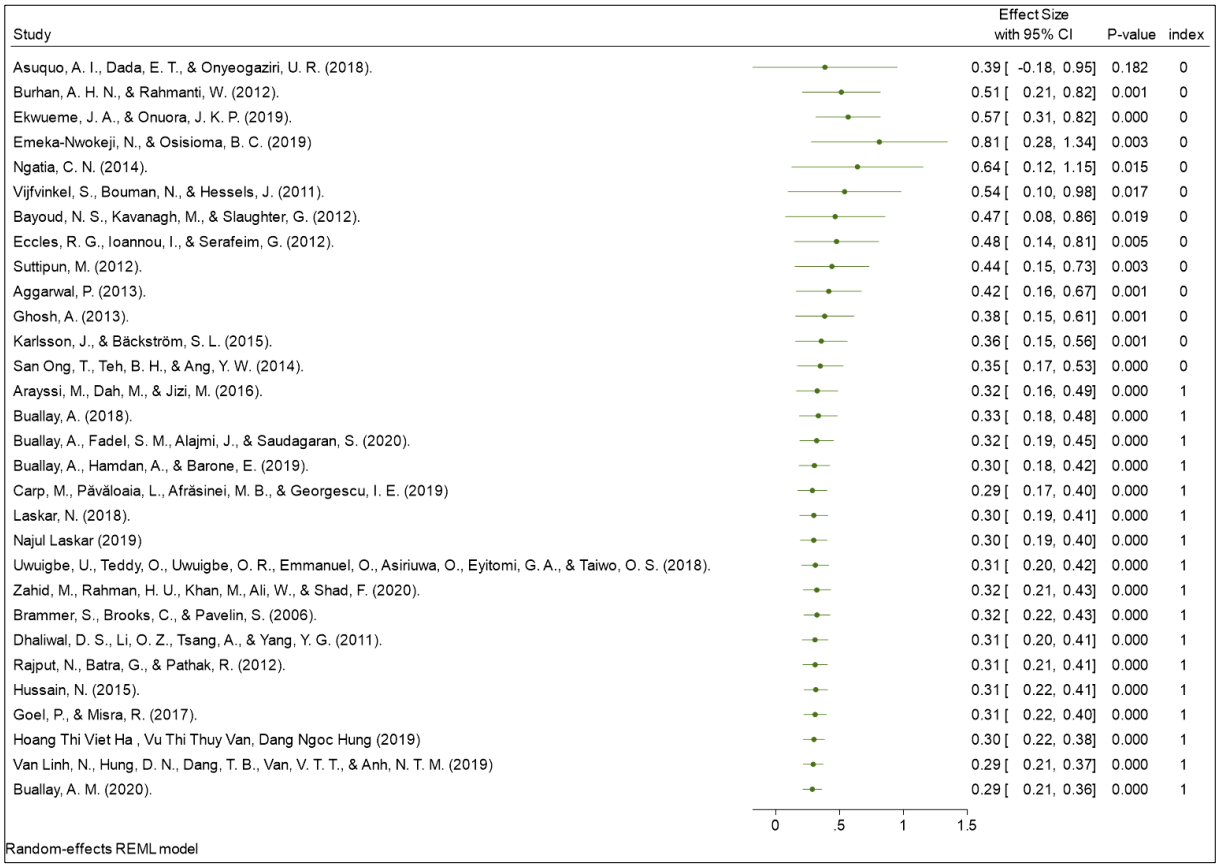


Table A.4. Forest plot chart presenting the relationship of sustainability reporting and financial performance by journal indexes

Study	Effect Size with 95% CI	Weight (%)
0		
Asuquo, A. I., Dada, E. T., & Onyeogaziri, U. R. (2018).	0.39 [-0.18, 0.95]	1.28
Burhan, A. H. N., & Rahmanti, W. (2012).	0.57 [0.20, 0.93]	2.25
Ekwueme, J. A., & Onuora, J. K. P. (2019).	0.68 [0.23, 1.13]	1.76
Emeka-Nwokeji, N., & Osisioma, B. C. (2019)	1.67 [1.10, 2.23]	1.28
Ngatia, C. N. (2014).	0.06 [0.01, 0.12]	4.67
Vijfvinkel, S., Bouman, N., & Hessels, J. (2011).	0.12 [0.01, 0.23]	4.38
Bayoud, N. S., Kavanagh, M., & Slaughter, G. (2012).	0.07 [-0.25, 0.39]	2.54
Eccles, R. G., Ioannou, I., & Serafeim, G. (2012).	0.59 [0.38, 0.80]	3.49
Suttipun, M. (2012).	0.21 [-0.08, 0.50]	2.83
Aggarwal, P. (2013).	0.25 [-0.07, 0.57]	2.54
Ghosh, A. (2013).	0.15 [0.02, 0.29]	4.13
Karlsson, J., & Backström, S. L. (2015).	0.17 [0.05, 0.29]	4.25
San Ong, T., Teh, B. H., & Ang, Y. W. (2014).	0.34 [0.11, 0.56]	3.34
Heterogeneity: τ^2 = 0.09, I^2 = 92.09%, H^2 = 12.65	0.35 [0.17, 0.53]	
Test of $\theta_i = \theta_j$: Q(12) = 67.97, p = 0.00		
1		
Arayssi, M., Dah, M., & Jizi, M. (2016).	0.13 [0.02, 0.23]	4.39
Buallay, A. (2018).	0.48 [0.35, 0.61]	4.21
Buallay, A., Fadel, S. M., Alajmi, J., & Saudagaran, S. (2020).	0.24 [0.18, 0.31]	4.64
Buallay, A., Hamdan, A., & Barone, E. (2019).	0.13 [0.07, 0.20]	4.64
Carp, M., Păvăloaia, L., Afrăsinei, M. B., & Georgescu, I. E. (2019)	0.04 [-0.22, 0.30]	3.03
Laskar, N. (2018).	0.49 [0.30, 0.67]	3.68
Najul Laskar (2019)	0.34 [0.07, 0.62]	2.92
Uwuigbe, U., Teddy, O., Uwuigbe, O. R., Emmanuel, O., Asiriuwa, O., Eyitomi, G. A., & Taiwo, O. S. (2018).	0.96 [0.22, 1.70]	0.84
Zahid, M., Rahman, H. U., Khan, M., Ali, W., & Shad, F. (2020).	0.91 [0.17, 1.65]	0.84
Brammer, S., Brooks, C., & Pavelin, S. (2006).	0.41 [0.14, 0.68]	2.96
Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011).	0.01 [-0.05, 0.07]	4.68
Rajput, N., Batra, G., & Pathak, R. (2012).	0.39 [0.26, 0.51]	4.24
Hussain, N. (2015).	0.45 [0.25, 0.65]	3.59
Goel, P., & Misra, R. (2017).	0.26 [0.07, 0.44]	3.75
Hoang Thi Viet Ha , Vu Thi Thuy Van, Dang Ngoc Hung (2019)	0.17 [0.05, 0.28]	4.31
Van Linh, N., Hung, D. N., Dang, T. B., Van, V. T. T., & Anh, N. T. M. (2019)	0.23 [0.11, 0.34]	4.32
Buallay, A. M. (2020).	0.18 [0.05, 0.31]	4.20
Heterogeneity: τ^2 = 0.02, I^2 = 84.64%, H^2 = 6.51	0.27 [0.19, 0.35]	
Test of $\theta_i = \theta_j$: Q(16) = 103.89, p = 0.00		
Overall	0.29 [0.21, 0.36]	
Heterogeneity: τ^2 = 0.03, I^2 = 87.53%, H^2 = 8.02		
Test of $\theta_i = \theta_j$: Q(29) = 173.73, p = 0.00		
Test of group differences: $Q_b(1)$ = 0.68, p = 0.41		
Random-effects REML model		

Note: 1 — Publication in ISI/Scopus-listed journal; 0 — Other publications.
Source: Authors' compilation.

Table A.5. The forest plot chart presenting the relationship between sustainability reporting and financial performance



Source: Authors' compilation.