Can Corporate Consciousness Attract Capital? Meta-Analysing the Link Between Corporate Sustainability and Access to Finance

Kishan Kumar Goel[1], Ritu Sapra[2], Neeraj Sehrawat[3], Amit Kumar *[4], Minakshi Paliwal[5] and Praveen S K

Abstract

Purpose- In imperfect capital markets, companies' ability to access financing depends on various idiosyncratic factors, including corporate sustainability (CS). Despite much work on this relationship, mixed results under differing contexts and empirical techniques have necessitated their synthesis and comparison. Hence, this study undertakes a meta-analysis of the extant empirical findings.

Design/methodology/approach- A meta-analysis of 83 effect sizes from 55 global studies representing a total sample of 134,428 firms is performed using the Hedges-Olkin (HOMA) procedure. First, an overall effect size is established, after which a sub-group analysis using categorical moderators is undertaken to investigate causes of heterogeneity based on methodological and contextual study-level moderators.

Findings- CS has a significant negative impact on financial constraints, evidencing that CS helps alleviate market frictions and eases corporates' access to capital. The sub-group moderator analyses revealed that weaker country-level ESG ecosystems and lower degrees of financial market development strengthen the relationship; that the relationship is strengthened over longer time periods; that financial constraint indices remain the most prominent measures of access to finance; and finally, that results vary across different measures of CS.

Practical Implications- The study findings indicate that inculcating a culture of sustainability in companies can be financially strengthening for corporate managements. Further, financial market participants should be motivated to consider CS while undertaking investment decisions.

Social Implications- The present study strengthens the business case for companies to contribute towards the United Nations Sustainable Development Goals (SDGs), notably SDG goal 12.6.

Originality- Adopting a rigorous and transparent methodology, this study is a unique attempt to quantitatively consolidate insights on the CS-financial constraints link and explores numerous moderators that may inform decision-makers and guide future work on the topic.

Keywords: ESG, financial constraints, CSR, meta-analysis, corporate finance, sustainability

[1] Department of Commerce, University of Delhi, New Delhi-110007. Email: kishankgoel@gmail.com
[2] Department of Commerce, University of Delhi, New Delhi-110007. Email: rsapra@commerce.du.ac.in
[3] Department of Management Studies, Shaheed Sukhdev College of Business Studies, University of Delhi, New Delhi-110089. Email: nrjsehrawat@sscbsdu.ac.in
[4] Department of Financial Studies, Shaheed Sukhdev College of Business Studies, University of Delhi, New Delhi-110089. *Corresponding Author. Email: amit.catlog@sscbsdu.ac.in
[5] Department of Commerce, Daulat Ram College, University of Delhi, New Delhi-110007. Email: minakshipaliwal@dr.du.ac.in

1. INTRODUCTION

Business sustainability is understood as the integration of environmental and social considerations into mainstream management and strategy. In recent times, immense interest from investors, corporate executives, and researchers has led to extensive investigations into the extent, nature, and direction of the relation between corporate finance and CSR, ESG, and sustainability[6] (Coelho et al., 2023; Gillan et al., 2021; Jayachandran et al., 2024). The incorporation of social responsibility into corporate strategy is increasingly being seen as a means of developing sustainable competitive advantage, long term success, and growth (Alniacik *et al.*, 2011). Hence, corporations in recent times have experienced growing pressure to 'do good' on sustainability issues (Huang, 2021).

A prominent stream of work in this area is the impact of sustainability factors on financial decision-making, including its impact on investment decisions and the engagement of capital market participants with company managements (Crowther & Seifi, 2021). The manner in which corporations raise financing from capital markets is changing, with firms' ability to address environmental, social, and corporate governance issues increasingly impacting not only their financial performance, but also their access to, and terms of financing (Deloitte, 2021).

Financial constraints refer to the inability of firms to access requisite funds from capital markets for the purpose of investing in NPV-positive projects, and are of immense strategic importance (Cheng *et al.*, 2014). The study of 'financial constraints', alternatively known as 'access to finance' occupies an important place in the corporate finance literature, even more so in developing economies (Agyei-Boapeah and Machokoto, 2018). The ability to mobilize needed capital is an imperative for firm survival, growth and profitability; however, often, due to imperfect financial markets, firms may face idiosyncratic market frictions that alter their ability to raise finance (Kumar and Ranjani, 2018). Among these firm-specific factors, various studies have looked at the role of corporate sustainability performance and reporting on firms' ability to raise finance. Yet despite these studies, the area remains unresolved, with empirical work proposing both positive and negative relationships. On the one hand, studies argue that sustainability initiatives may aggravate financial constraints since they utilize otherwise useful resources (Bhandari and Javakhadze, 2017) while also being susceptible to overinvestment (Hmaittane *et al.*, 2020); while on the other hand, CS has been shown to improve access to financing by alleviating informational asymmetries and agency costs (Cheng *et al.*, 2014; Samet *et al.*, 2018).

It is in this light that the present study attempts to answer: *does corporate sustainability impact the ability to access finance?* This is achieved through synthesizing the extant literature by using systematic procedures for the searching, screening, and coding of information from relevant research studies, and the examination of an overall effect using meta-analytic procedures. Additionally, sources of variance in the findings among the included studies are investigated using sub-group analysis to account for study-level methodological, and contextual factors.

This study is relevant in the context of a volatile and complex business landscape where firms are expected to address complex needs from a variety of stakeholders (Fender *et al.*, 2020). The United Nations' Sustainable Development Goals (SDGs) are an integrated framework of 169 targets clustered under 17 goals aimed at solving pertinent global environmental and social challenges as adopted by the United Nations General Assembly (Hernández-Orozco *et al.*, 2022; UN, 2016). Acknowledging the 2030 target for the achievement of the SDGs, involvement in sustainable action is emerging as a central concern for companies across the globe (Singhal, 2023). Contributing to this discourse, the present work

[6] In line with the extant literature (Singhania and Chadha, 2023) for the purpose of this paper unless otherwise specified, the term 'sustainability' has been used as an umbrella to include concepts such as 'ESG' and 'CSR'.

is among the first of its kind to integrate findings from disparate research work on the CS-financial constraints area, contributing to the discourse on the value-relevance of CS in promoting long-term success.

The remainder of this paper is organized as follows: Section 2 gives a brief background of the extant literature and develops the hypotheses to be investigated; Section 3 presents the methodology of the meta-analytic study; Section 4 presents the results and findings; and finally, Section 5 concludes.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Theoretical Framework

This study primarily draws from stakeholder theory, based on the seminal work of Freeman (1984). Stakeholder views attempt to redefine the manner in which businesses, business processes, and the business environment are perceived to reflect a system based on relationships between various interconnected stakeholders (Freeman *et al.*, 2010). This is in contention with the shareholder perspective, which places sole emphasis on creating value for shareholders or owners (Friedman, 1970). Acknowledging wide-ranging parties interested in the organizations' activities, the stakeholder theory naturally provides a basis for sustainability concerns, attempting to draw a synthesis between economic motives and social ones (Peng and Isa, 2020). Stakeholder engagement has been invariably found to positively impact financial outcomes (Cheng *et al.*, 2014), and has been used extensively as one of the most emphasised theoretical bases for framing the social responsibility—corporate finance link (Coelho *et al.*, 2023). More specifically, to the extent that financial market participants value social responsibility and sustainability initiatives, stakeholders such as investors may use markets to incentivise corporate responsibility (Agyei-Boapeah *et al.*, 2023). This provides the opportunity for companies to strategically utilize sustainability to differentiate themselves, gain trust, and reap capital market advantages (Siegel and Vitaliano, 2007). Given findings that stakeholder value is positively associated with shareholder value, the stakeholder perspective offers a sound theoretical basis for analysing the impact of CS on financial constraints.

2.2 Corporate sustainability and financial constraints

Corporate sustainability has been the subject of research interest in the social sciences since the mid-1900s, but it was not until after the World Wars in the 1950s that the term 'CSR' was coined in the seminal work of Bowen (1953), and that its linkages with corporate finance drew attention (Carroll, 2009; Friede *et al.*, 2015). Although originally seen as a part of CSR, sustainability has grown to attain larger popularity amongst business and academic communities, given views that it more aptly addresses the core idea of adopting a stakeholder orientation for enhancing long-term success while also escaping the unrelenting burden towards society often assumed in relation to CSR obligations (Carroll, 2021). More recently, with the adoption of the UN SDGs, interest in 'ESG', the acronym first coined in the 2004 report, has grown. ("Who Cares Wins-The Global Compact Connecting Financial Markets to a Changing World.", 2004) has skyrocketed. This rise was further catalysed by the Covid-19 crisis (Fender *et al.*, 2020), and by the realization that since ESG explicitly states its concerns, it represents a less abstract notion than CSR (Huang, 2021). Given that both CSR and ESG represent frameworks to achieve sustainability and are highly related concepts, various studies use sustainability as a general term to include both (Rudžionienė and Brazdžius, 2023; Singhania and Chadha, 2023).

The premise behind mainstreaming sustainability in business is based on the argument that fulfilling social expectations is integral to the long-term interests of companies (Chang & Yu, 2024), and that stakeholder considerations can reduce the risk of undesirable legal or regulatory action (Freeman, 1984). On the other hand, some scholars argue that social

responsibility is contrary to firm objectives (Friedman, 1970), that managers may indulge in self-interested behaviour and overinvest in it to hide inefficiencies, and that it leads to cost stickiness (Habib, 2019). These contrarian views led to a proliferation in research (Carroll, 2021; Coelho *et al.*, 2023; Gillan *et al.*, 2021; Huang, 2021). Attempting to consolidate findings from these numerous studies, numerous meta-analytic studies have looked at the relationship between CS's financial performance. Friede et al. (2015) examined more than 2000 individual studies and found that over 90 per cent posit a positive relationship between sustainability and financial performance. Khan (2022) bifurcates the sustainability disclosure and firm performance literature into three themes based on bibliometric techniques and subsequently meta-analysed. The study found a positive relationship between firm characteristics and sustainability performance, and a positive yet insignificant relation between sustainability disclosure and financial performance. Other meta-analytic studies on the corporate sustainability-financial performance link include the paper by Wang et al. (2016), who find a strong positive relation, and the study by Orlitzky et al. (2003), who also find a positive link with varying strength depending on how corporate social performance is measured.

Hence, much work to date has looked at how sustainability impacts financial variables. However, no existing review or meta-analysis has yet examined the impact on financial constraints, an essential aspect of corporate financial strategy.

In a world devoid of perfect capital markets, it is not uncommon to witness firms unable to access required funding to invest in NPV-positive investments, which drive business success (Almeida and Campello, 2010; Samet *et al.*, 2018). Although these factors are various, they are often idiosyncratic, and as a result, firms may face exclusion from financial markets due to a number of factors (Kumar and Ranjani, 2018). It is increasingly being witnessed that global investors, especially in developed and developing economies, are integrating non-financial considerations such as ESG into their investment decisions (Kawk & Choi, 2015; Kling et al., 2021; Kotsantonis, 2016). Sustainability performance is increasingly being seen as an appealing tool to attract investors and reduce financial constraints (Boubaker et al. 2020), and increasing evidence proves the favourable impact of sustainable practices and non-financial disclosure on overall financial performance (Banerjee et al., 2020; Dhaliwal et al., 2011; García-Sánchez et al., 2019; Zhao & Xiao, 2019). Hence, this study first investigates the evidence on the impact of CS on financial constraints, hypothesizing a significant relationship:

Hypothesis 1 (H1): *There exists a significant association between CS and financial constraints*

In addition, despite the fact that CSR and ESG connote highly similar concepts regarding a company's sustainability performance (Kaźmierczak, 2022), there do exist some identifiable differences in their characterizations. While CSR refers more to companies' responsibilities and obligations, ESG represents a framework for assessing corporate actions aimed at addressing performance, and the demands of stakeholders and shareholders (Park *et al.*, 2023). Therefore, in addition to the overall effect of sustainability, a breakdown of the overall relation is attempted, in which the studies are classified as having either a CSR focus or an ESG focus. The following hypotheses are framed:

Hypothesis 2 (H2): *There exists a significant association between ESG and financial constraints*

Hypothesis 3 (H3): *There exists a significant association between CSR and financial constraints*

2.3 Contextual moderators

In addition to overall assessments, this study also considers it crucial to examine the potential variance in results stemming from differing study contexts. Therefore, this study takes into account two pertinent contextual moderators to uncover these differences:

First, the level of financial constraints confronted by firms may be influenced by the level of economic and financial market development of the country in which the firm operates (Kumar *et al.*, 2023; Kumar and Ranjani, 2018) Although research indicates that financial constraints are largely encountered due to firm-specific factors (Silva and Carreira, 2012), it has also been argued that the level of financial constraints faced by firms may be influenced by the level of financial constraints of a country and the level of development of its financial markets (Singhania and Chadha, 2023). Hence, it is expected that the degree to which sustainability can alleviate (or aggravate) financial constraints is influenced by financial market development in a nation. Thus, it is hypothesized:

Hypothesis 4 (H4): *The level of financial sector development in the study region moderates the association between CS and financial constraints*

On a similar note, the degree to which a country engages in sustainable development goals (SDGs) is expected to be a determinant of the level to which companies operating there will focus their attention to such issues. Studies have indicated that the country's SDG performance is linked with improved CS disclosure and transparency (Hoang *et al.*, 2023). Firms' attention to sustainability issues will also be influenced by the governmental, legal, and regulatory environment around sustainability topics (Campbell, 2007; Singhania and Chadha, 2023). Hence, it is hypothesized that:

Hypothesis 5 (H5): *The extent of ESG reporting and performance in the study region moderates the association between CS and financial constraints*

2.4 Methodological moderators

It is common for meta-analyses to consider moderation in the central relationship based on differences in the methodologies adopted by the sample studies (Oduro *et al.*, 2022). Addressing this, first, it is observed that the impact of CS on firms' finances has been found to increase over time (Whelan *et al.*, 2021) and that it has immense managerial implications in the long run (Fafaliou *et al.*, 2022). Hence, this study proposes that the length of the time period studied will have an impact on the hypothesized relationship.

Second, studies to date have presented various arguments for or against the available measures of financial constraints used in research. Despite much churn, this issue is greatly due to the absence of any single directly observable balance sheet item, which measures firms' level of financial constraints (Silva and Carreira, 2012). While financial constraints indices have been proposed and used by various authors, novel approaches have begun to emerge questioning their prevalence. Therefore, this study examines the moderating impact of the choice of financial constraints measure on the overall link between sustainability and financial constraints.

Third, the manner in which sustainability is scored, calculated, initially reported, and subsequently updated impacts perceptions on firms' sustainability performance and has a significant impact on ESG-related research. (Sahin *et al.*, 2023). Measures of sustainability are often complex, subjective, and divergent (Berg *et al.*, 2022). Therefore, this study analyses the differences in study findings based on the type of measure employed for measuring or proxying CS. Based on these methodological moderators, the following hypotheses are defined:

Hypothesis 6 (H6): *The length of the studied time period moderates the association between CS and financial constraints*

Hypothesis 7 (H7): *The measure used for financial constraints moderates the association between CS and financial constraints*

Hypothesis 8 (H8): *The measure used for CS moderates the association between CS and financial constraints*

Figure 1 graphically represents the research framework and hypotheses for this study. The figure depicts the central relationship between CS and financial constraints which is further

broken down into CSR and ESG. Subsequently, the moderating impact of contextual moderators and methodological moderators is assessed.

3. METHODOLOGY

Strong upward growth in finance research has begun to necessitate techniques such as meta-analyses which are capable of summarizing findings empirically (Geyer-Klingeberg *et al.*, 2020). Meta-analysis, is a statistical technique of analysing past studies to synthesize findings and provide a basis for empirical insights to inform practice and policy (Borenstein, 2009). The following sections describe the procedures adopted in this study.

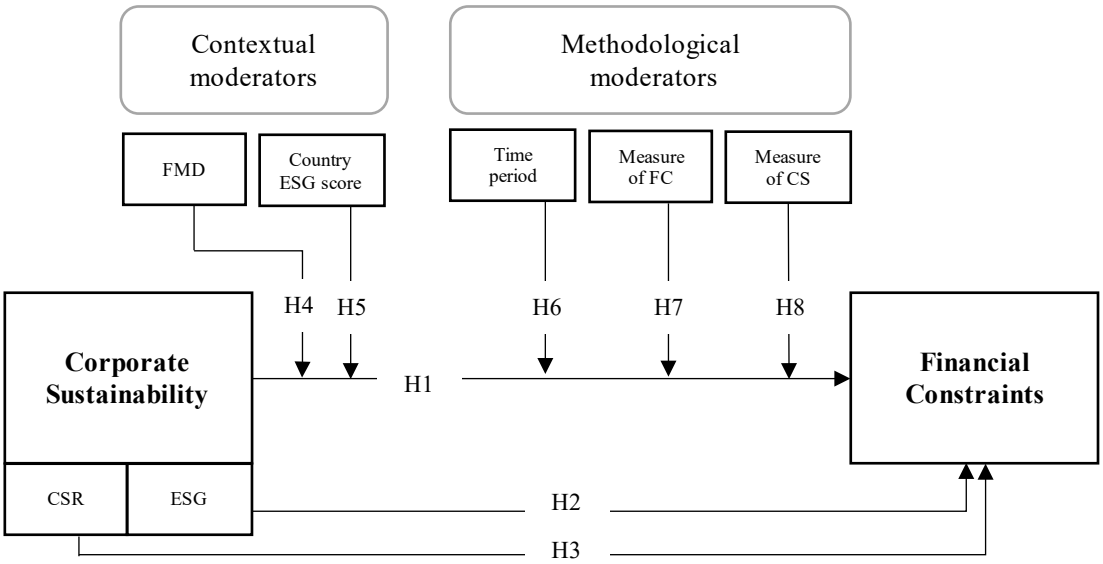

Figure 1: Conceptual framework of the study
Note: 'FMD' stands for Financial Market Development Index; 'FC' stands for financial constraints; 'CS' stands for Corporate Sustainability

3.1 Sampling

A systematic procedure for searching relevant literature was employed. The literature search was conducted in the Scopus and Web of Science databases. The search string employed was *(("CSR" OR "ESG" OR "SOCIAL* RESPONSIB*" OR "SUSTAINAB*") AND ("ACCESS TO FINANC*" OR "ACCESS TO CAPITAL" OR "FINANCI* CONSTRAIN*" OR "CAPTAL CONSTRAIN*") AND ("FIRM" OR "CORPORAT*" OR "COMPAN*" OR "ENTERPRISE"))*. Boolean operators including '*', 'AND', 'OR', and parentheses were used to enhance search quality. A flowchart following the PRISMA guidelines (Page *et al.*, 2021) depicting the selection of relevant studies is given in Figure 2. A total of 1801 documents were obtained, from which duplicates were removed, and which were screened based on titles, abstracts, and subsequently assessed for relevance to the topic, leading to a pool of 83 documents. Subsequently, the reference sections of the selected documents were examined to identify any other relevant studies in a 'backward reference searching' procedure. Additionally, manual searches were conducted in Google Scholar, given its known ability to adequately search

unpublished or 'grey' literature (Haddaway *et al.*, 2015). This led to the addition of 16 studies, bringing the total to 99 papers.

The exclusion/inclusion criteria used for assessing the documents were as follows. First, only studies published in English were considered. Second, studies using qualitative methodologies, those which did not mention beta coefficients and /or without a correlation matrix of key variables, those in which the sample size was not mentioned, and those studies

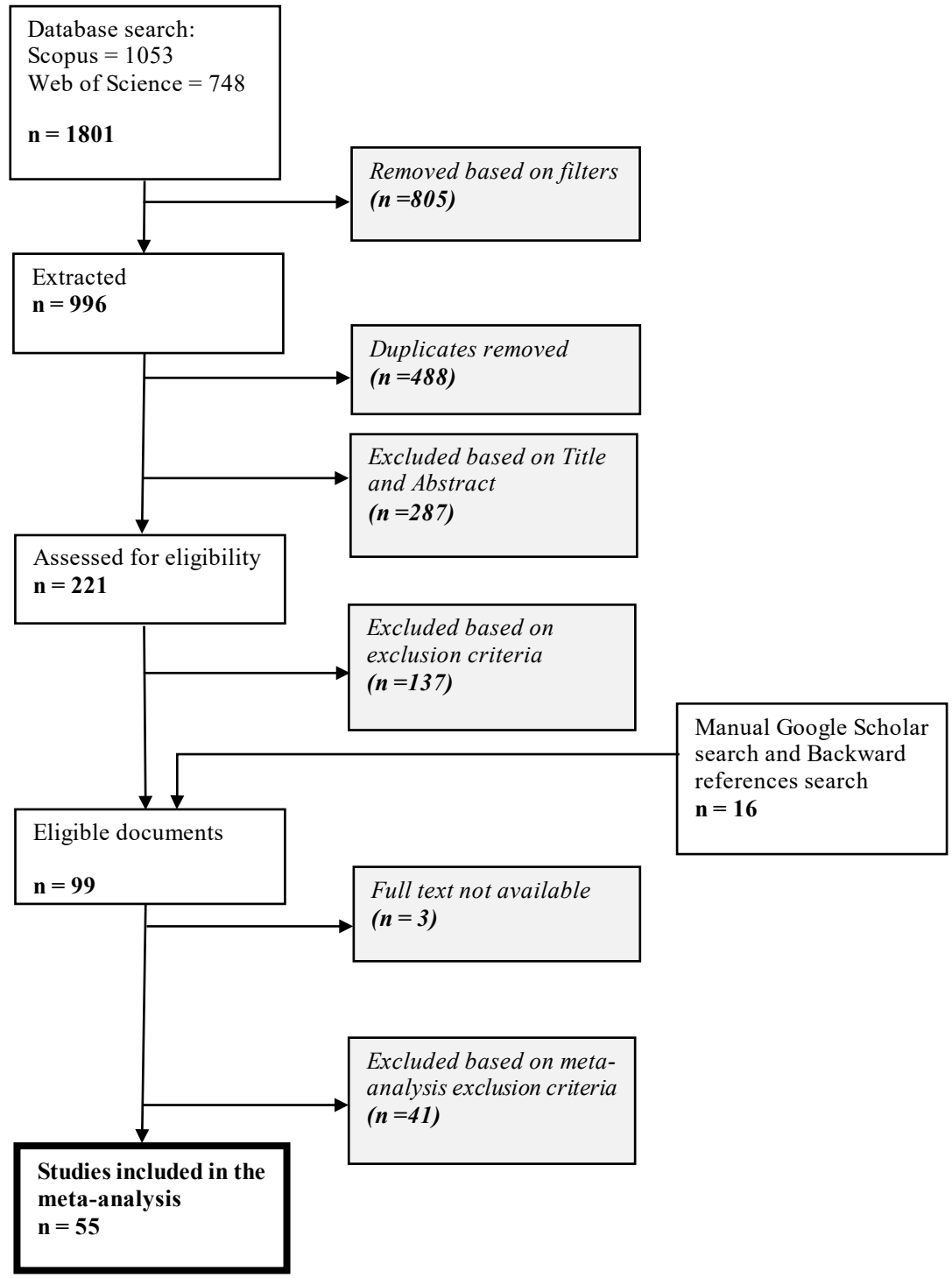

Figure 2: Flowchart depicting document selection procedure following PRISMA guidelines

using SEM or non-regression methodologies were excluded due to meta-analytic requirements. Third and finally, only studies where CS and financial constraints constituted major variables were included.

It may be noted that no restriction on year of publication, region of study, or type of document was applied. The article selection procedure included grey literature as well, given that this aids in comprehensiveness while conducting a meta-analysis.

The full texts of 3 articles were not available. After assessing the remaining 96 documents for the availability of meta-analytic data as mentioned in the inclusion/exclusion criteria above, 41 documents could not be included, leaving a final sample of 55 studies.

3.2 Coding

Once the final documents addressing the impact of CS on financial constraints were listed, a code sheet was prepared to collect pertinent data for meta-analytic procedures.

The effect size is the quantification of the magnitude of a relationship between variables. For the computation of the overall effect size in a meta-analysis, at least one effect size from each included study must be identified from summary statistics, on the basis of which they are then synthesized based on sample size to produce an overall effect (Cooper *et al.*, 2009).

Following past meta-analyses (Galama and Scholtens, 2021; Gurler, 2024; Singhania and Gupta, 2024), for the purpose of this study the Pearson correlation coefficients were used as the effect sizes and drawn from the sample of primary studies. For those studies that did not provide a correlation matrix, the formula and procedure suggested by Peterson & Brown (2005) for the conversion of Beta coefficients into Pearson correlation coefficients was employed. The formula used was:

$$r = 0.98ß + 0.05\lambda$$

[where, r = partial correlation coefficient; ß = reported beta coefficient; and, λ assumes the value of 1 if ß is non-negative, and 0 otherwise].

Two conflicting objectives must be considered in the case when one of the included studies reports more than one effect size. The first objective is to include a maximum number of effect sizes to increase meta-analytic results, and the other relates to maintaining sample independence with the aim of avoiding biases resulting from over-representation of certain samples due to the inclusion of more than one effect size in the pool (Hunter *et al.*, 1984). This study emphasized the objective of maintaining statistical independence and only included effect sizes based on unique samples, or where a different variable altogether was assessed (Galama and Scholtens, 2021). Hence, when 'ESG' and 'Environmental', 'Social', and 'Governance' factors were all analysed separately, this study only included the overall ESG effect, since the individual pillars were merely sub-samples. Their inclusion would lead to study over-representation. Additionally, following the recommendation of Stanley & Doucouliagos (2012), when the same relationship was analysed under different models, only the model with the highest R^2 was considered.

Following this procedure, the final sample consisted of 55 studies, generating 83 effect sizes (k = 83) based on a total sample size of 134,428 firms (N = 134,428). A forest plot depicting the included studies and their effect sizes is given in Figure 3.

In addition to data relating to effect sizes and sample sizes, further information was also coded to facilitate sub-group moderator analyses. The focus of each effect—whether ESG or CSR— was coded, along with the region of the study, the time period of the sample, as well as the type and source of data for each of the key variables, including ESG or CSR or sustainability, and financial constraints. Subsequently, since this study also aimed to uncover the moderating impact of contextual ESG and financial constraints, country-level data were obtained relating to national sustainability performance and financial market development.

Following Singhania & Chadha (2023), country-level data for ESG policies was obtained from the Carrots and Sticks database, which is a freely available database of the number of identifiable voluntary or non-voluntary policies promoting ESG in the respective country ("Carrots and Sticks Database", n.d.). Studies whose regional focus was a single country were ranked according to the number of policies identified through this database. Studies pertaining to countries with policies ranging from 0-33 were classified as 'Low', those ranging from 34-66 as 'Medium', and those above 67 as 'High'. Next, also following the work of Singhania & Chadha (2023), it was hypothesized that countries with a higher level of financial market development will be more inclined to consider sustainability initiatives and hence enjoy fewer financing constraints. As a proxy for this, data was obtained from the International Monetary Fund's (IMF) Data portal wherein the IMF constructs a Financial Development Index which "summarizes how developed financial institutions and financial markets are in terms of their depth (size and liquidity), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues and the level of activity of capital markets" (IMF Data, n.d.). Single country studies with countries having an index value from 0.33 to 0.66 were coded as 'Moderate', and those above 0.67 were coded as 'High'. Since no study pertained to a region that had an index score below 0.33, no category for 'Low' was included.

3.3 Meta-analytical procedure

The meta-analysis was conducted using the Meta-Essentials Package (Version 1.5). For the subgroup analysis, studies were categorized based on contextual factors, including the level of development of financial markets, and the level of ESG reporting and performance at the national level; as well as methodological moderators, including: time period studied, measure of financial constraints, measure of CS, and the type of effect size. Additionally, the studies were bifurcated based on whether they focussed on ESG or CSR.

Following various past studies (Galama and Scholtens, 2021; Oduro *et al.*, 2022; Singhania and Gupta, 2024), the random effects Hedges and Olkin's Meta Analysis (HOMA) approach was used to calculate the average effect size. Given that a high degree of heterogeneity was found in the studies, this is the most appropriate course in order to account for individual study-level characteristics (Gurler, 2024) . Prior to the calculation of the summary effects, the effect sizes are transformed to standardized normal metrics by using Fisher's z-transformation to address skewness (Hedges and Olkin, 1985). This procedure gives weight to more significant results (Oduro *et al.*, 2022).

For the moderator analysis, since the moderators were of a categorical nature (dummy coded), sub-group analysis was deemed fit. The between-study variance technique posited by Geyskens et al. (2009) was used, in which a significant $Q_{between}$ indicates that the moderator explains the heterogeneity (Wilson and Lipsey, 2001).

To check for publication bias, the Failsafe-N test proposed by Rosenthal (1979) is employed, which calculates the number of studies that would have to be included in the pool of primary in order to result in an insignificant overall effect size from the meta-analysis (Stanley and Doucouliagos, 2012).

#	Study name	Correlation	CI Lower limit	CI Upper limit	Weight
1	(Agoraki et al., 2023)	-0.03	-0.08	0.01	1.31%
2	(Agoraki et al., 2023)	-0.11	-0.16	-0.07	1.31%
3	(Agyei-Boapeah et al., 2023)	-0.04	-0.09	0.02	1.29%
4	(Agyei-Boapeah et al., 2023)	-0.09	-0.15	-0.03	1.29%
5	(Agyei-Boapeah et al., 2023)	-0.02	-0.08	0.03	1.29%
6	(Agyei-Boapeah et al., 2023)	-0.14	-0.19	-0.08	1.29%
7	(Ajward & Takehara, 2014)	-0.04	-0.12	0.04	1.21%
8	(AlHares et al., 2023)	-0.01	-0.24	0.22	0.69%
9	(Anri & Utama, 2024)	-0.02	-0.31	0.26	0.55%
10	(Anwar et al., 2019)	-0.25	-0.49	0.02	0.58%
11	(Attig et al., 2014)	-0.00	-0.04	0.03	1.33%
12	(B. Cheng et al., 2014)	-0.45	-0.53	-0.36	1.12%
13	(B. Cheng et al., 2014)	-0.02	-0.13	0.09	1.12%
14	(B. Cheng et al., 2014)	-0.08	-0.19	0.03	1.12%
15	(B. Cheng et al., 2014)	-0.18	-0.28	-0.07	1.12%
16	(Banerjee et al., 2020)	-0.03	-0.08	0.01	1.32%
17	(Bhandari & Javakhadze, 2017)	0.06	-0.02	0.13	1.24%
18	(Bolin & Rana, 2021)	-0.09	-0.19	0.01	1.15%
19	(Bolin & Rana, 2021)	-0.59	-0.65	-0.52	1.15%
20	(Bolin & Rana, 2021)	-0.19	-0.28	-0.09	1.15%
21	(Carey et al., 2021)	-0.13	-0.16	-0.09	1.33%
22	(Chang & Yu, 2024)	-0.21	-0.25	-0.16	1.31%
23	(Chang & Yu, 2024)	-0.13	-0.18	-0.09	1.31%
24	(Choi & Kawk, 2015)	-0.10	-0.21	0.00	1.13%
25	(Choi & Kawk, 2015)	-0.29	-0.39	-0.19	1.13%
26	(D. Zhang, 2022b)	0.02	-0.03	0.07	1.31%
27	(D. Zhang, 2022b)	-0.07	-0.11	-0.02	1.31%
28	(D. Zhang, 2022b)	-0.01	-0.05	0.03	1.32%
29	(D. Zhang, 2022b)	-0.05	-0.09	-0.01	1.32%
30	(Du et al., 2023)	0.27	0.07	0.44	0.80%
31	(Fafaliou et al., 2022)	-0.02	-0.07	0.03	1.30%
32	(Fafaliou et al., 2022)	-0.04	-0.09	0.01	1.30%
33	(Fafaliou et al., 2022)	-0.13	-0.18	-0.08	1.30%
34	(Farooq & Noor, 2023)	-0.08	-0.24	0.09	0.90%
35	(García-Sánchez et al., 2019)	-0.02	-0.07	0.04	1.28%
36	(García-Sánchez et al., 2019)	-0.03	-0.08	0.03	1.28%
37	(García-Sánchez et al., 2019)	-0.01	-0.07	0.05	1.28%
38	(Guo et al., 2023)	-0.23	-0.30	-0.16	1.23%
39	(Hao & Wu, 2024)	-0.19	-0.26	-0.12	1.24%
40	(He et al., 2023)	0.00	-0.05	0.05	1.30%
41	(Hmaittane et al., 2020)	0.02	-0.22	0.27	0.65%
42	(Hu, 2023)	-0.02	-0.06	0.02	1.33%
43	(Huang et al., 2023)	-0.02	-0.07	0.04	1.29%
44	(J. Li et al., 2022)	0.00	-0.11	0.11	1.12%
45	(J. Li et al., 2022)	-0.02	-0.19	0.14	0.91%

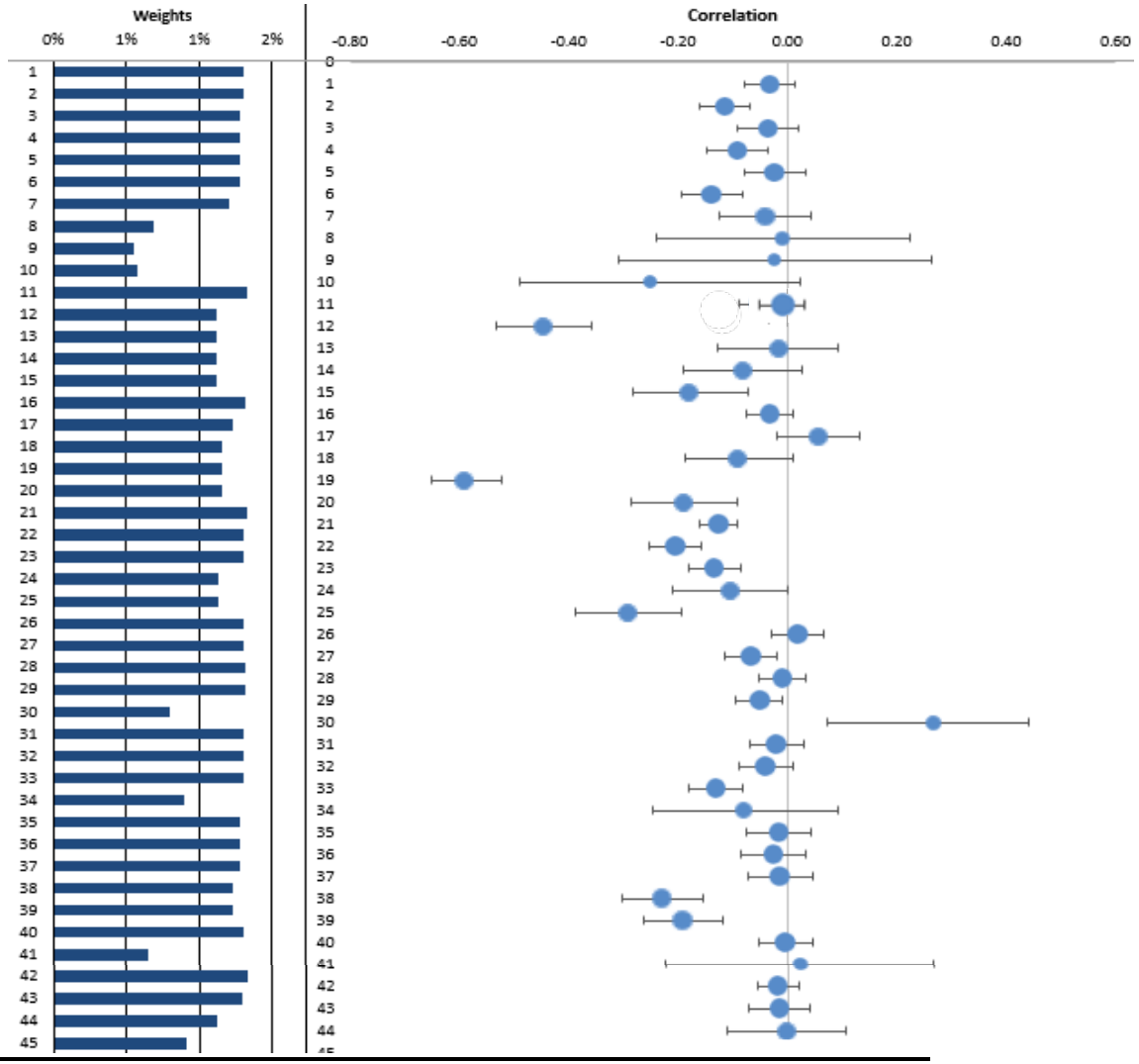

Figure 3: Forest plot of included studies

46	(J.-J. Li et al., 2021)	-0.16	-0.23	-0.09	1.26%
47	(Kumar et al., 2023)	-0.25	-0.30	-0.21	1.30%
48	(Lai & Zhang, 2022)	-0.02	-0.10	0.06	1.23%
49	(Meng et al., 2022)	-0.32	-0.40	-0.24	1.19%
50	(N. Liu et al., 2019)	-0.12	-0.21	-0.02	1.17%
51	(N. Liu et al., 2019)	0.00	-0.10	0.09	1.17%
52	(P. J. Liu et al., 2022)	-0.12	-0.22	-0.02	1.14%
53	(P. J. Liu et al., 2022)	-0.07	-0.17	0.03	1.14%
54	(Qian, 2024)	-0.01	-0.04	0.03	1.33%
55	(Samet & Jarboui, 2017)	0.00	-0.10	0.10	1.16%
56	(Samet et al., 2018)	0.00	-0.10	0.10	1.16%
57	(Song & Deng, 2023)	-0.37	-0.40	-0.33	1.32%
58	(Sun et al., 2022)	-0.05	-0.13	0.03	1.21%
59	(Tang, 2022)	-0.01	-0.16	0.14	0.98%
60	(Tseng, 2022)	-0.01	-0.23	0.20	0.74%
61	(W. Li et al., 2020)	-0.15	-0.22	-0.07	1.23%
62	(Wang & Li, 2023)	-0.24	-0.29	-0.19	1.30%
63	(Wei et al., 2024)	-0.18	-0.26	-0.09	1.19%
64	(Wu et al., 2023)	-0.33	-0.40	-0.26	1.23%
65	(X. Bai et al., 2022)	-0.01	-0.05	0.02	1.33%
66	(X. Bai et al., 2022)	-0.40	-0.42	-0.37	1.33%
67	(Xiaoyu, 2023)	-0.02	-0.06	0.02	1.32%
68	(Y. Li, 2024)	-0.01	-0.05	0.03	1.33%
69	(Y. Li, 2024)	-0.08	-0.12	-0.04	1.32%
70	(Y. Xu & Zhu, 2024)	-0.07	-0.14	0.00	1.25%
71	(Yu, 2023)	-0.13	-0.16	-0.09	1.32%
72	(Yu, 2023)	-0.01	-0.04	0.03	1.33%
73	(Yu, 2023)	-0.43	-0.48	-0.38	1.27%
74	(Z. Li et al., 2021)	-0.01	-0.08	0.06	1.25%
75	(Z. Liu et al., 2021)	-0.16	-0.20	-0.11	1.31%
76	(Zhang & Lucey, 2022)	-0.02	-0.03	-0.01	1.36%
77	(Zhang et al., 2020)	-0.14	-0.19	-0.10	1.31%
78	(Zhang et al., 2020)	-0.37	-0.41	-0.33	1.31%
79	(Zhang et al., 2020)	-0.26	-0.31	-0.22	1.31%
80	(Zhang et al., 2021)	-0.01	-0.08	0.07	1.24%
81	(Zhang et al., 2023)	0.00	-0.03	0.02	1.34%
82	(Zhang et al., 2023)	-0.04	-0.07	-0.01	1.34%
83	(Zhao & Xiao, 2019)	-0.25	-0.29	-0.20	1.31%

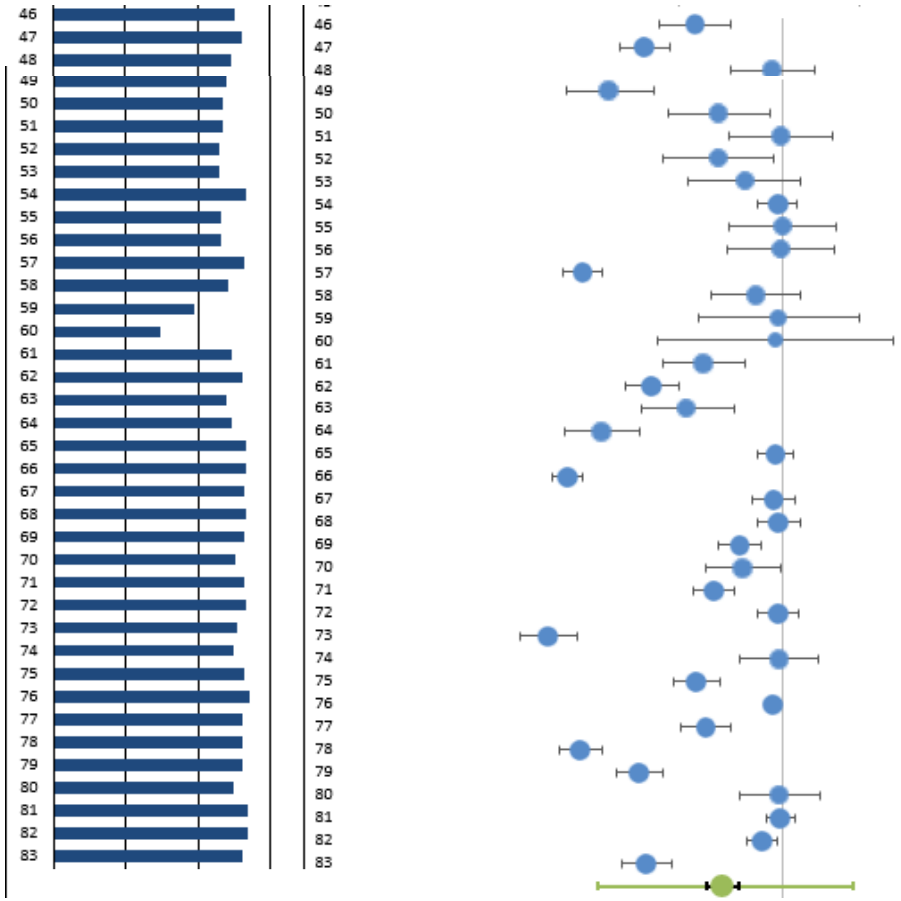

Figure 3 continued…

4. RESULTS

4.1 Descriptive characteristics of included studies

Figure 4 presents a graphical representation of key characteristics that describe the included studies. From the database and reference searches, 55 documents that were relevant to the topic and that fulfilled the meta-analytic requirements were studied. Having coded them for various characteristics, sub-groups were formed for moderator analyses.

The first contextual moderator relates to country ESG, i.e., sustainability focus, and was based on the Carrots and Sticks database. Single-country studies focussing on countries with 'Moderate' performance comprised a significant majority with 49 effect sizes, while those with 'Low' and 'High' performance were observed 5 and 6 times respectively. The second contextual moderator analysed was the level of financial market development which served as an indication of access, efficiency and inclusiveness of capital markets. No study in a single country related to 'Low' levels of financial development, indicating a significant gap. Again, the 'Moderate' level dominated, with 48 effect sizes and only six from 'regions with 'High' development. Next, study methodology-level moderators were examined. A significant majority of effect sizes were based on studies looking at the relationship between sustainability and financial constraints over relatively longer time periods, greater than 5 years. Coming to the measures used for financial constraints, the KZ index, WW index, and SA index are used in 69 effect sizes, with the KZ index being used the most. Among the different measures used for sustainability, both the Thomson Reuters Refinitiv ESG scores, and China-specific scores including ESG scores predominantly from the CSMAR, Hexun, and WIND databases, are used in 20 effect sizes each. Interestingly, dummies are also used in 12 effect sizes. Finally, from the total 83 effect sizes, 48 were Pearson correlation coefficients obtained from correlation matrices reported in the primary studies, while the remaining 35 were partial correlation coefficients derived from beta coefficients using the formula by (Peterson and Brown, 2005).

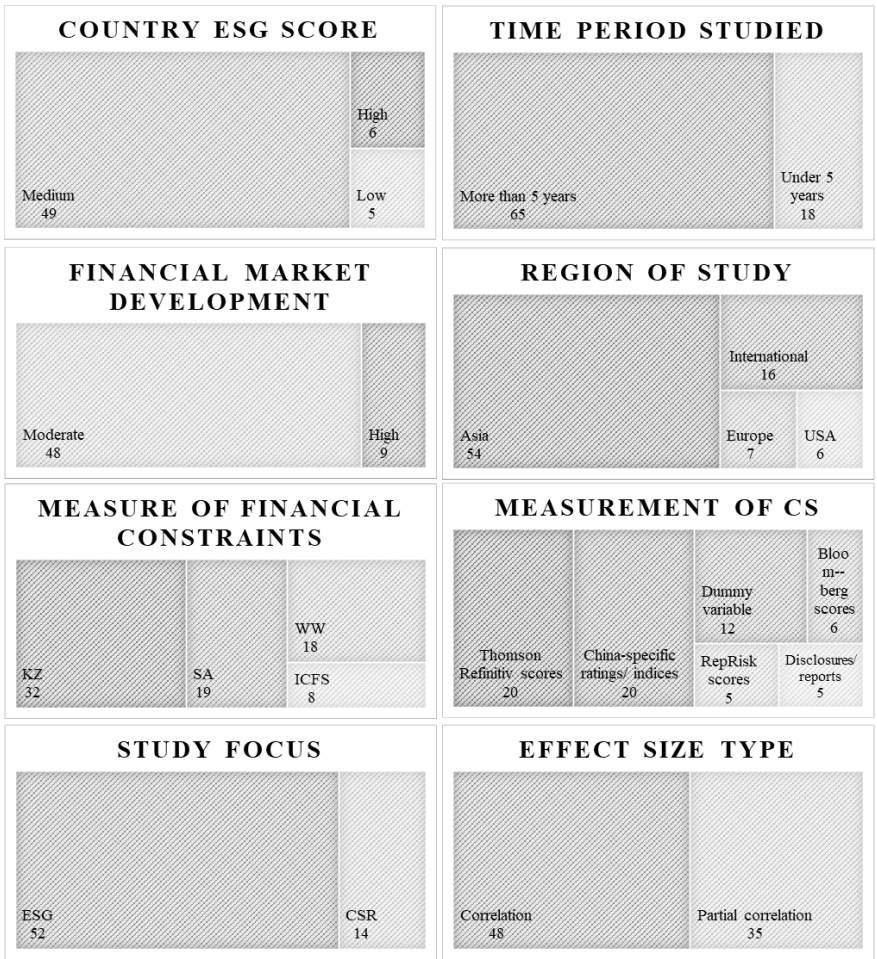

Figure 4: Descriptive characteristics of the included studies

4.2 Main effects, heterogeneity, and publication bias

Table 1 reports the findings for the main relationship between overall CS and financial constraints (FC), and the separate relationships of ESG and CSR with financial constraints.

A random effects meta-analysis was

performed on the 83 effect sizes comprising a cumulative sample size of 134,428 firms. The impact of CS reporting and performance on financial constraints was found to have a statistically significant negative effect (r= -0.11, p=0.000). This indicates that CS initiatives can alleviate financial constraints in companies and are hence strategically relevant in enabling firms' access to financing (Carey *et al.*, 2021; Cheng *et al.*, 2014; Choi and Kawk, 2015).

Next, the relationship is decomposed by segregating studies focussing on ESG and those focussing on CSR. Both ESG and CSR were found to have identical statistically significant negative linkages to financial constraints (r= -0.10, p= 0.000) confirming the value-relevance of CS and validating H2 and H3. The between study variance using the Q statistic was calculated for the two sub-groups of ESG and CSR. However, the p-value of the between study variance was 0.952 indicating an insignificant difference. Therefore, studies conceptualizing CS as either ESG or CSR appear to find similar findings. This confirms that both terms represent highly similar concepts (Kaźmierczak, 2022).

Publication bias reflects the probability that statistically significant results are more likely to be published (Rothstein *et al.*, 2005). To check for the presence of publication bias, the Fail-safe N statistic proposed by (Rosenthal, 1979) was computed, which represents the number of insignificant studies that must be included to make the resulting effect insignificant. If the calculated statistic exceeds the critical value computed as 5k+10, where k is the number of effect sizes, then it is assumed that publication bias is absent (Galama and Scholtens, 2021). As can be seen in Table 1, the Fail-safe N statistic for the main relationship is significantly larger than the critical value, and hence publication bias may be ruled out.

Next, the heterogeneity test was conducted. Heterogeneity tests are done to examine whether the 'true' underlying effect is in fact influenced by contextual and other factors, which necessitates the further investigation of moderators and effect sizes within the resulting sub-groups (Hirsch *et al.*, 2023; Stanley and Doucouliagos, 2012). The I^2 metric (Higgins *et al.*, 2003) is a test of homogeneity which is useful in identifying whether or not variance in studies can be further investigated, since the more the value diverges from 0, the more likely it is that moderators analyses can explain the variance (Borenstein, 2009). The calculated I^2 value came out to be 95.73 per cent, indicating significant heterogeneity. Hence, the assumption of homogeneity was rejected (Gallardo-Vázquez *et al.*, 2019) and moderators were identified and analysed in a sub-group analysis.

Hypothesized relationship	k	N	Effect size	p-value	95% CI		I^2(%)	Publication bias	
					Low	High		Fail-safe N	Critical value
1. CS and FC	83	134428	-0.11	0.000	-0.14	-0.08	95.73	1736	425
2. ESG and FC	52	102710	-0.10	0.000	-0.15	-0.06	96.50	550	260
3. CSR and FC	14	11837	-0.10	0.000	-0.16	-0.04	88.54	41	80

Table 1: Meta-analysis results (Random effects)
Note: (1) 'CS' stands for Corporate Sustainability; 'FC' stands for financial constraints
(2) Critical value of publication buas is calculated as 5k+10

4.3 Moderator analysis

As the test for heterogeneity revealed significant explainable variance a sub-group analysis of potential moderators was undertaken, the findings for which are given in Table 2.

First, coming to the contextual moderators, the sub-group analysis was conducted including only single-country studies for which data was available. The first contextual moderator was the level of financial development of the region under consideration. A total of 57 effect sizes were used for this analysis, of which 48 were classified as 'moderate' and 9 'high' based on the Financial Market Index developed by the IMF. The effect size for the 'high'

category (r = -0.06, p= 0.068) was found to be lower than that of the 'moderate' category (r= -0.12, p= 0.000) indicating that the negative effect of sustainability on financial constraints is stronger in developing regions than in developed ones. The Q-statistic was significant at the 10 percent significance level (Qbetween = 2.89, p 0.089), indicating that the level of financial market development does, in fact, moderate the main relationship. Similarly, for the next moderator, which was the level of ESG focus in a country as estimated by the number of policies in place based on data from the Carrot and Sticks database, 60 effect sizes were analysed. The results indicated that countries with 'high' scores showed a weak and insignificant negative impact (r= -0.03, p= 0.294). 'Moderate' countries showed a significant negative impact (r= -0.12, p= 0.000) and those in the 'low' category had the strongest significant negative impact (r= -0.16, p= 0.002). The variance analysis was significant ($Q_{between}$ = 9.21, p= 0.010). Thus, hypotheses 4 and 5 stand validated.

Both these moderators taken together indicate that the level of access to finance in a country as well as the strength of the ESG ecosystem both are inversely related to the impact of CS on financial constraints. In sum, these factors are more relevant in countries where financial markets and the sustainability regulations are weaker. These results are in line with those of Manrique & Martí-Ballester (2017) who found that the positive impact of environmental performance on financial performance was stronger for a sample of developing nations than developed countries, as well as Chen et al. (2023) and Sandberg et al. (2023) who suggest that the positive impact of ESG on financial performance may be stronger in countries with less developed financial markets (Bai and Kim, 2024).

Next, methodological moderators pertaining to research designs adopted in the primary studies were analysed. The first such moderator was the time period studied. All 83 effect sizes were classified based on whether the underlying sample was for a period of up to 5 years or more. The findings indicate that studies examining longer time periods show a stronger negative effect (r = -0.12, p = 0.000) than shorter time periods (r = -0.06, p = 0.023). The variance analysis was significant ($Q_{between}$ = 5.05, p= 0.025) indicating that the sub-groups did in fact differ in their effects, validating Hypothesis 6. Next, sub-group analyses based on the variable measurement techniques for CS and access to finance were conducted. For the measurement of firms' access to finance, four sub-groups comprising the top 4 measurement techniques were coded, which accounted for 77 out of the 83 effect sizes. Studies using the KZ index were found to have the strongest negative effect (r = -0.13, p= 0.000), followed by the WW index (r = -0.12, p= 0.003), and the SA index (r = -0.11, p= 0.000). Investment to cash flow sensitivity, which, prior to the development of the KZ index (Kaplan and Zingales, 1997), constituted an extensively used early proxy for financial constraints, is found to have a small and insignificant negative impact (r= -0.02, p = 0.360). Hypothesis 7 stood validated given that the Q-test showed significant variance ($Q_{between}$ = 18.60, p= 0.000). Finally, the moderator relating to the measure of sustainability was analysed. Although a variety of measurement techniques were used, sub-groups were formed for those appearing in 5 or more effect sizes, representing 68 of the total 83 effects. Studies which used firm disclosures and reports to proxy for sustainability reported the strongest negative aggregate effect (r= -0.22, p = 0.000), followed by studies using dummies (r= -0.15, p = 0.000). More frequently used measures such as the Thomson Refinitiv ESG scores (r= -0.11, p = 0.005) and China-specific ratings and indices (r= -0.10, p = 0.003) reported significant negative effects, which were more in line with the aggregate effect of -0.11. The variance analysis was significant ($Q_{between}$ = 14.38, p= 0.026) implying that the manner of measuring CS did in fact impact the overall link.

Finally, a robustness check was conducted to check for differences between whether the effect sizes were Pearson product correlations or partial correlations. Although the variance analysis reported a significant value ($Q_{between}$ = 5.24, p= 0.022), implying differences in the sub-

groups, both results— for Correlations (r= -0.08, p = 0.000), and for Partial correlations (r= -0.15, p = 0.000)— were negative and significant and in line with the overall findings.

5. CONCLUSION

Perceptions that the sustainability-financial performance relationship remains inconclusive continue to persist in the extant literature (Gallardo-Vázquez *et al.*, 2019). One reason for this may be the broad focus of studies, which fail to capture specific relationships. There is a need to deepen the understanding of how social responsibility plays a role in corporate finance by delving into more fine-grained research problems (Benlemlih, 2017). It is in this context that this study attempted to address the specific question of how corporate sustainability impacts the ability to access financial resources.

The past literature has produced various insights on the ability of corporate sustainability to improve access to finances (Liang and Chen, 2024). However, no study to date has quantitatively consolidated these studies to identify an underlying trend as well as delve into various moderators that may influence this link. Acknowledging this gap, this study systematically obtains 55 individual empirical studies and uses rigorous meta-analytic techniques to identify a significant negative influence of sustainability reporting and action on corporations' financial constraints. These findings are consistent with numerous past studies (Cheng *et al.*, 2014; García-Sánchez *et al.*, 2019; Samet *et al.*, 2018) which indicates that integrating sustainability concerns into mainstream business can provide tangible financial benefits in improved access to funding, which in turn can be used for various profitable investments and thus enhance firm performance. Also, the meta-analysis found that much as expected, studies which focus on sustainability in the form of either 'ESG', or 'CSR', lead to identical results, suggesting the close relation and interchangeability of these terms.

Addressing heterogeneity among study contexts and analytical techniques, this study uncovers various moderators through a sub-group analysis. It was discovered that in countries where financial market development is lower than in developed regions and where sustainability concerns are moderate, this relationship is stronger. This finding is significant as it proves that corporate action and reporting are essential indicators in the absence of superior institutional mechanisms to facilitate capital flows, and where ESG considerations are prevalent. This is indicative of a substitution effect, wherein companies can substitute for deficiencies in the external landscape with their own sustainability performance to cater to conscious investors, and supports the work of Priem and Gabellone (2024) who found that firm-level ESG can substitute for weaker legal environments and reduce the cost of capital.

Additionally, this meta-analysis uncovered differences in the methodological approach to analysing the sustainability-financial constraints link, to find that: first, the relationship is found to be stronger in studies which assess longer time periods—re-affirming that corporate sustainability's relevance grows in the longer-term; second, that despite criticism the KZ, SA, and WW indices remain the most popular choices for measuring access to finance producing results more in sync with overall findings; and finally, that there exists high variability in results obtained based on different measures of corporate sustainability.

In sum, while study characteristics and contextual aspects show variance, all effect sizes indicated a negative impact of sustainability on financial frictions, strengthening the business case for sustainable action.

Moderators/ Subgroups		k	N	Effect size	p-value	95% CI Lower	95% CI Upper	Z	I^2(%)	$Q_{between}$	$p(Q_{between})$	Pseudo R^2(%)
Contextual Moderators	***Financial Market Development:***											
	High	9	9512	-0.06	0.068	-0.14	0.02	-1.82	83.50	*2.89*	*0.089*	*4.81*
	Moderate	48	73736	-0.12	0.000	-0.16	-0.08	-5.94	96.63			
	Country ESG score:											
	High	6	8257	-0.03	0.294	-0.10	-0.04	-1.05	78.80	*9.21*	*0.010*	*14.74*
	Medium	49	74289	-0.12	0.000	-0.16	-0.08	-5.97	96.57			
	Low	5	926	-0.16	0.002	-0.30	-0.02	-3.12	59.06			
Methodological Moderators	***Time period studied:***											
	More than 5 years	65	85475	-0.12	0.000	-0.16	-0.09	-6.87	95.83	*5.05*	*0.025*	*4.78*
	Under 5 years	18	48953	-0.06	0.023	-0.12	-0.00	-2.28	89.89			
	Measure of Financial Constraints:											
	KZ index	32	43098	-0.13	0.000	-0.18	-0.07	-4.81	95.67	*18.60*	*0.000*	*16.72*
	SA index	19	26694	-0.11	0.000	-0.17	-0.05	-3.96	95.35			
	WW index	18	57240	-0.12	0.003	-0.21	-0.03	-2.94	97.38			
	Investment-cash flow sensitivity	8	5430	-0.02	0.360	-0.06	0.03	-0.92	24.48			
	Measure of Sustainability:											
	Thomson Refinitiv scores	20	45172	-0.11	0.005	-0.19	-0.03	-2.81	92.98	*14.38*	*0.026*	*12.61*
	China-specific ratings/indices	20	42706	-0.10	0.003	-0.17	-0.03	-2.93	97.72			
	Dummy variable	12	14263	-0.15	0.000	-0.22	-0.08	-4.67	93.59			
	Bloomberg scores	6	8361	-0.13	0.095	-0.31	0.07	-1.67	97.34			
	RepRisk scores	5	8216	-0.07	0.003	-0.13	-0.00	-2.93	76.80			
	Firm disclosures and reports	5	2823	-0.22	0.000	-0.33	-0.10	-5.07	70.87			
Robustness Check	***Effect size type:***											
	Correlation	48	99349	-0.08	0.000	-0.11	-0.05	-4.73	95.00	*5.24*	*0.022*	*5.19*
	Partial correlation	35	35079	-0.15	0.000	-0.20	-0.09	-5.41	95.29			

Table 2 Sub-group analysis results
Note: Critical value of publication bias is calculated as 5k+10

Meta-analyses are useful as a basis for future research on the topic (Borenstein, 2009). In this vein, various avenues for future studies were identified through this work. First, as can be observed from the descriptive breakdown of the included studies, a majority consider time periods up to 5 years. Given that benefits from sustainability initiatives are known to grow over longer time periods (Whelan *et al.*, 2021), it is suggested that further work take this into consideration in sample design. Second, in relation to regions studied, few studies look at international samples, and there exists an overwhelming focus on Chinese studies. Future work in the area of financial constraints may look into other developing countries, given their higher vulnerability to environmental and social risks (Sarangi, 2021) which have been largely ignored. A third gap identified is that very few studies consider the varying impact of industry affiliation on the corporate sustainability-financial constraints link, which restricted the ability to conduct industry-level analyses in this study. Since some industries may be unambiguously deemed more susceptible to environmental and social risks, it is suggested that future work focus on this area to provide more practical insights. Finally, there is scarcely any research on how this relationship operates in times of crises versus non-crises periods, implying a significant gap, given that crises have been found to exacerbate financial constraints (Zhang *et al.*, 2023).

This study possesses the potential to offer numerous insights to policymakers, practitioners, and researchers interested in the field of sustainability, which have been elaborated in the following sections. However, despite these, it is also important to note that this study possesses some limitations. First, this study limits itself to a meta-analysis and sub-group analyses. However, meta-regression analysis (MARA) using continuous moderators are particularly useful in a deeper investigation of heterogeneity and revealing further relationships (Hirsch *et al.*, 2023), and hence, future work may attempt to perform meta-regression analyses. Second, since a correlation coefficient was used, it is not possible to establish a causal relationship (Gurler, 2024).

5.1 Theoretical implications

The present study significantly contributes to the extant literature on sustainability and corporate finance.

First, this is a unique and pioneering attempt to empirically synthesize the existing evidence on the corporate sustainability-financial constraints link. Adopting a rigorous, objective, and transparent methodology with an exhaustive literature search, this meta-analysis is expected to lead to further such studies, which can delve into the deeper

nuances of corporate sustainability and unravel their role in corporate finance.

Second, this study adds to the growing discourse advocating the integration of environmental and social considerations in business and, by providing quantitative evidence, strengthens the business case for sustainable action as a means of attracting financing. This work adds to the prevalent discourse on the potential benefits of engaging in socially conscious behaviours and consolidates findings in order to establish a more coherent field.

Third, this study significantly adds to stakeholder theory and illustrates the interconnectedness of stakeholders and the benefits that can accrue by prioritizing a larger view of the organization (Freeman, 2017; Freeman *et al.*, 2010). This study evidences opposition to traditional shareholder views, which paint sustainability as a zero-sum activity in which society's gain is essentially shareholders' loss, and demonstrates that financial resources flow towards firms that prioritize broader societal and stakeholder interests.

Finally, this study also adds to the institutional theory according to which businesses operate in a societal context with defined norms, expectations, and practices as developed by social actors (Singhania and Chadha, 2023). Increased social legitimacy by adhering to institutional expectations can boost survival, performance, and market position (Singhania *et al.*, 2024). By delving into the moderating role of country-level ESG and financial market development on the sustainability-financial constraints link, this study contributes to this discourse by highlighting how idiosyncratic factors can overcome the external deficiencies to deliver advantages.

5.2 Practical implications

Apart from contributing to academic theory and the research field, this study also offers relevant practical insights that can help inform policy and managerial practice.

First and foremost, with the 2030 deadline for achieving the UN SDGs drawing ever closer, the present business environment can be characterised by one with rapidly expanding regulatory and strategic interest in sustainable action (Castilla-Polo *et al.*, 2024). In special reference to SDG 12, which relates to 'responsible consumption and production', target 12.6 aims to *'encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle'* (UN DESA, 2024). It is clear that the present study directly relates to this aim and acts as an

impetus for firms to fervently participate in furthering sustainable objectives, which will offer a win-win scenario. This can especially be achieved by adopting integrative strategic sustainability initiatives that prioritize issues based on stakeholder needs (Singhal, 2023).

Second, growing instances of environmental risks (Zheng *et al.*, 2024) as well as the persistence of several social challenges and massive corporate governance failures, have highlighted the vulnerability of businesses to hazards originating beyond the traditional business environment (Kumar and Rajan, 2021). In such a context, the relevance of engaging with stakeholders and integrating sustainability is at a peak. This study informs corporate managers and practitioners regarding the potential benefits of engaging in sustainability issues beyond the risk-mitigating potential and validates the belief that sustainability is a real differentiator and means of attracting funding in capital markets.

Hence, the present study offers much in the manner of consolidating diverse research studies and synthesizing them to extract meaning and future direction. The present work is expected to act as a motivator to advance sustainability action, policy, and discourse, as well as lay the basis for future work in the area.

REFERENCES

Agyei-Boapeah, H., Ciftci, N., Kalimilo Malagila, J., Brodmann, J. and Fosu, S. (2023), "Environmental performance and financial constraints in emerging markets", *Accounting Forum*, Vol. 84 No. 4, pp. 1–33, doi: 10.1080/01559982.2023.2169893.

Agyei-Boapeah, H. and Machokoto, M. (2018), "Allocation of internally generated corporate cash flow in Africa", *Journal of Accounting in Emerging Economies*, Vol. 8 No. 4, pp. 495–513, doi: https://doi.org/10.1108/JAEE-10-2017-0099.

Almeida, H. and Campello, M. (2010), "Financing Frictions and the Substitution Between Internal and External Funds", *Journal of Financial and Quantitative Analysis*, Vol. 45 No. 3, pp. 589–622, doi: https://doi.org/10.1017/S0022109010000177.

Alniacik, U., Alniacik, E. and Genc, N. (2011), "How corporate social responsibility information influences stakeholders' intentions", *Corporate Social Responsibility and Environmental Management*, Vol. 18 No. 4, pp. 234–245, doi: 10.1002/csr.245.

Bai, H. and Kim, J. (2024), "Do ESG Practices Promote Financial Performance? Comparison of English, Chinese, and Korean Papers Through Bibliometric and Meta-Analysis", *Sustainability*, Vol. 16 No. 22, doi: https://doi.org/10.3390/su16229810.

Benlemlih, M. (2017), "Corporate social responsibility and firm financing decisions: A literature review", *Journal of Multinational Financial Management*, Vol. 42–43, pp. 1–10, doi: 10.1016/j.mulfin.2017.10.004.

Berg, F., Kölbel, J.F. and Rigobon, R. (2022), "Aggregate Confusion: The Divergence of ESG Ratings", *Review of Finance*, Vol. 26 No. 6, pp. 1315–1344, doi: 10.1093/rof/rfac033.

Bhandari, A. and Javakhadze, D. (2017), "Corporate Social Responsibility and Capital Allocation Efficiency", *Journal of Corporate Finance*, Vol. 43, pp. 354–377, doi: http://dx.doi.org/10.1016/j.jcorpfin.2017.01.012.

Borenstein, M. (Ed.). (2009), *Introduction to Meta-Analysis*, John Wiley & Sons, Chichester, U.K.

Bowen, H.R. (1953), *Social Responsibilites of the Businessman*, Harper & Brothers.

Campbell, J.L. (2007), "Why would corporations behave in socially responsible ways? an institutional theory of corporate social responsibility", *Academy of Management Review*, Vol. 32 No. 3, pp. 946–967, doi: 10.5465/amr.2007.25275684.

Carey, P., Khan, A., Mihret, D.G. and Muttakin, M.B. (2021), "Voluntary sustainability assurance, capital constraint and cost of debt: International evidence", *International Journal of Auditing*, Vol. 25 No. 2, pp. 351–372, doi: 10.1111/ijau.12223.

Carroll, A.B. (2009), "A History of Corporate Social Responsibility: Concepts and Practices", in Crane, A., Matten, D., McWilliams, A., Moon, J. and Siegel, D.S. (Eds.), *The Oxford Handbook of Corporate Social Responsibility*, 1st ed., Oxford University Press, pp. 19–46, doi: 10.1093/oxfordhb/9780199211593.003.0002.

Carroll, A.B. (2021), "Corporate Social Responsibility: Perspectives on the CSR Construct's Development and Future", *Business & Society*, Vol. 60 No. 6, pp. 1258–1278, doi: 10.1177/00076503211001765.

"Carrots and Sticks Database". (n.d.). , available at: https://www.carrotsandsticks.net/.

Castilla-Polo, F., García-Martínez, G., Guerrero-Baena, M.D. and Polo-Garrido, F. (2024), "The cooperative ESG disclosure index: an empirical approach", *Environment, Development and Sustainability*, pp. 1–26, doi: https://doi.org/10.1007/s10668-024-04719-x.

Chen, S., Song, Y. and Gao, P. (2023), "Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance", *Journal of Environmental Management*, Vol. 345, p. 118829, doi: https://doi.org/10.1016/j.jenvman.2023.118829.

Cheng, B., Ioannou, I. and Serafeim, G. (2014), "Corporate social responsibility and access to finance", *Strategic Management Journal*, Vol. 35 No. 1, pp. 1–23, doi: 10.1002/smj.2131.

Choi, S.B. and Kawk, Y.M. (2015), "Corporate social responsibility and financial constraints: Evidence from Korean firms", *Global Business and Finance Review*, Vol. 20 No. 2, pp. 15–26, doi: 10.17549/gbfr.2015.20.2.15.

Coelho, R., Jayantilal, S. and Ferreira, J.J. (2023), "The impact of social responsibility on corporate financial performance: A systematic literature review", *Corporate Social Responsibility and Environmental Management*, Vol. 30 No. 4, pp. 1535–1560, doi: 10.1002/csr.2446.

Cooper, H.M., Hedges, L.V. and Valentine, J.C. (Eds.). (2009), *The Handbook of Research Synthesis and Meta-Analysis*, 2. ed., Russell Sage Foundation, New York.

Fafaliou, I., Giaka, M., Konstantios, D. and Polemis, M. (2022), "Firms' ESG reputational risk and market longevity: A firm-level analysis

for the United States", *Journal Of Business Research*, Vol. 149, pp. 161–177, doi: 10.1016/j.jbusres.2022.05.010.

Fender, R., Stammers, R. and Urwin, R. (2020), "Future of Sustainability in Investment Management: From Ideas to Reality", CFA Institute.

Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Pitman, Boston.

Freeman, R.E. (2017), "The New Story of Business: Towards a More Responsible Capitalism", *Business and Society Review*, Vol. 122 No. 3, pp. 449–465, doi: 10.1111/basr.12123.

Freeman, R.E., Parmar, B.L. and Harrison, J.S. (2010), *Stakeholder Theory: The State of the Art*, Vol. 99, Management Faculty Publications.

Friede, G., Busch, T. and Bassen, A. (2015), "ESG and financial performance: aggregated evidence from more than 2000 empirical studies", *Journal of Sustainable Finance & Investment*, Vol. 5 No. 4, pp. 210–233, doi: 10.1080/20430795.2015.1118917.

Friedman, M. (1970), "The social responsibility of business is to increase its profits", *New York Times Magazine*, 13 September, pp. 122–126.

Galama, J.T. and Scholtens, B. (2021), "A meta-analysis of the relationship between companies' greenhouse gas emissions and financial performance", *Environmental Research Letters*, Vol. 16 No. 4, p. 043006, doi: 10.1088/1748-9326/abdf08.

Gallardo-Vázquez, D., Barroso-Méndez, M.J., Pajuelo-Moreno, M.L. and Sánchez-Meca, J. (2019), "Corporate Social Responsibility Disclosure and Performance: A Meta-Analytic Approach", *Sustainability*, Vol. 11 No. 4, p. 1115, doi: 10.3390/su11041115.

García-Sánchez, I.-M., Hussain, N., Martínez-Ferrero, J. and Ruiz-Barbadillo, E. (2019), "Impact of disclosure and assurance quality of corporate sustainability reports on access to finance", *Corporate Social Responsibility and Environmental Management*, John Wiley and Sons Ltd, Vol. 26 No. 4, pp. 832–848, doi: 10.1002/csr.1724.

Geyer-Klingeberg, J., Hang, M. and Rathgeber, A. (2020), "Meta-analysis in finance research: Opportunities, challenges, and contemporary applications", *International Review of Financial Analysis*, Vol. 71, p. 101524, doi: 10.1016/j.irfa.2020.101524.

Gillan, S.L., Koch, A. and Starks, L.T. (2021), "Firms and social responsibility: A review of ESG and CSR research in corporate finance", *Journal of Corporate Finance*, Vol. 66, p. 101889, doi: 10.1016/j.jcorpfin.2021.101889.

Gurler, H.E. (2024), "The impact of corporate social responsibility on green innovation: do industry, data type and region matter? a meta-

analysis research", *Environment, Development and Sustainability*, pp. 1–27, doi: https://doi.org/10.1007/s10668-024-05277-y.

Haddaway, N.R., Collins, A.M., Coughlin, D. and Kirk, S. (2015), "The role of Google Scholar in evidence reviews and its applicability to grey literature searching", *PloS One*, Public Library of Science San Francisco, CA USA, Vol. 10 No. 9, p. e0138237, doi: https://doi.org/10.1371/journal.pone.0138237.

Hedges, L. and Olkin, I. (1985), *Statistical Methods for Meta-Analysis*, Academic Press, New York.

Hernández-Orozco, E., Lobos-Alva, I., Cardenas-Vélez, M., Purkey, D., Nilsson, M. and Martin, P. (2022), "The application of soft systems thinking in SDG interaction studies: a comparison between SDG interactions at national and subnational levels in Colombia", *Environment, Development and Sustainability*, pp. 1–35, doi: https://doi.org/10.1007/s10668-021-01808-z.

Higgins, J., Thompson, S.G., Deeks, J.J. and Altman, D.G. (2003), "Measuring inconsistency in meta-analyses", *BMJ*, Vol. 327, pp. 557–560, doi: https://doi.org/10.1136/bmj.327.7414.557.

Hirsch, S., Petersen, T., Koppenberg, M. and Hartmann, M. (2023), "CSR and firm profitability: Evidence from a meta-regression analysis", *Journal of Economic Surveys*, Vol. 37 No. 3, pp. 993–1032, doi: 10.1111/joes.12523.

Hmaittane, A., M'Zali, B. and Mnsari, M. (2020), "The Impact of Corporate Social Responsibility on Oil and Gas Firms' Access to Finance", *Journal of Accounting and Finance*, Vol. 20 No. 1, doi: 10.33423/jaf.v20i1.2741.

Hoang, T.H.V., Pham, L. and Nguyen, T.T.P. (2023), "Does country sustainability improve firm ESG reporting transparency? The moderating role of firm industry and CSR engagement", *Economic Modelling*, Vol. 125, p. 106351, doi: 10.1016/j.econmod.2023.106351.

Huang, D.Z.X. (2021), "Environmental, social and governance (ESG) activity and firm performance: a review and consolidation", *Accounting & Finance*, Vol. 61 No. 1, pp. 335–360, doi: 10.1111/acfi.12569.

Hunter, J.E., Schmidt, F.L., Jackson, G.B. and Feldman, J.M. (1984), "Review of Meta-Analysis: Cumulating Research Findings across Studies", *The Academy of Management Review*, Academy of Management, Vol. 9 No. 1, pp. 165–166, doi: 10.2307/258247.

IMF Data. (n.d.). "Financial Development Index Database", available at: https://data.imf.org/?sk=f8032e80-b36c-43b1-ac26-493c5b1cd33b.

Kaplan, S.N. and Zingales, L. (1997), "Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?", *The Quarterly Journal of Economics*, Vol. 112 No. 1, pp. 169–215, doi: 10.1162/003355397555163.

Kaźmierczak, M. (2022), "A literature review on the difference between CSR and ESG", *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*, Politechnika Śląska. Wydawnictwo Politechniki Śląskiej, No. 162, pp. 275-289, doi: http://dx.doi.org/10.29119/1641-3466.2022.162.16.

Khan, M.A. (2022), "ESG disclosure and firm performance: A bibliometric and meta analysis", *Research in International Business and Finance*, Vol. 61, p. 101668, doi: https://doi.org/10.1016/j.ribaf.2022.101668.

Kumar, K., Kumari, R., Poonia, A. and Kumar, R. (2023), "Factors influencing corporate sustainability disclosure practices: empirical evidence from Indian National Stock Exchange", *Journal of Financial Reporting and Accounting*, Vol. 21 No. 2, pp. 300–321, doi: 10.1108/JFRA-01-2021-0023.

Kumar, R. and Rajan, M. (2021), *Outlast: How ESG Can Benefit Your Business*, HarperCollins India.

Kumar, S. and Ranjani, K.S. (2018), "Financial constraints and investment decisions of listed Indian manufacturing firms", *Financial Innovation*, Vol. 4 No. 1, p. 6, doi: 10.1186/s40854-018-0090-4.

Liang, X. and Chen, X.C. (2024), "Mandatory corporate social responsibility disclosure and financial constraints: Evidence from China", *International Review of Economics & Finance*, Vol. 89, pp. 954–974, doi: 10.1016/j.iref.2023.08.011.

Manrique, S. and Martí-Ballester, C.-P. (2017), "Analyzing the effect of corporate environmental performance on corporate financial performance in developed and developing countries", *Sustainability*, Vol. 9 No. 11, p. 1957, doi: https://doi.org/10.3390/su9111957.

Oduro, S., Adhal Nguar, K.D., De Nisco, A., Alharthi, R.H.E., Maccario, G. and Bruno, L. (2022), "Corporate social responsibility and SME performance: a meta-analysis", *Marketing Intelligence & Planning*, Vol. 40 No. 2, pp. 184–204, doi: 10.1108/MIP-05-2021-0145.

Orlitzky, M., Schmidt, F.L. and Rynes, S.L. (2003), "Corporate social and financial performance: a meta-analysis", *Organization Studies*, Vol. 24 No. 3, pp. 403–441, doi: https://doi.org/10.1177/0170840603024003910.

Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., Shamseer, L., *et al.* (2021), "The PRISMA 2020 statement: an updated guideline for reporting systematic reviews", *Systematic Reviews*, Vol. 10 No. 1, p. 89, doi: 10.1186/s13643-021-01626-4.

Park, J.G., Park, K., Noh, H. and Kim, Y.G. (2023), "Characterization of CSR, ESG, and corporate citizenship through a text mining-based review of literature", *Sustainability*, Vol. 15 No. 5, p. 3892, doi: https://doi.org/10.3390/su15053892.

Peng, L.S. and Isa, M. (2020), "Environmental, Social and Governance (ESG) Practices and Performance in Shariah Firms: Agency or Stakeholder Theory?", *Asian Academy of Management Journal of Accounting and Finance*, Vol. 16 No. 1, pp. 1–34, doi: 10.21315/aamjaf2020.16.1.1.

Peterson, R.A. and Brown, S.P. (2005), "On the Use of Beta Coefficients in Meta-Analysis.", *Journal of Applied Psychology*, Vol. 90 No. 1, pp. 175–181, doi: 10.1037/0021-9010.90.1.175.

Priem, R. and Gabellone, A. (2024), "The impact of a firm's ESG score on its cost of capital: can a high ESG score serve as a substitute for a weaker legal environment", *Sustainability Accounting, Management and Policy Journal*, Vol. 15 No. 3, pp. 676–703, doi: https://doi.org/10.1108/SAMPJ-05-2023-0254.

Rosenthal, R. (1979), "The file drawer problem and tolerance for null results.", *Psychological Bulletin*, Vol. 86 No. 3, p. 638, doi: https://psycnet.apa.org/doi/10.1037/0033-2909.86.3.638.

Rothstein, H.R., Sutton, A.J. and Borenstein, M. (Eds.). (2005), *Publication Bias in Meta-Analysis: Prevention, Assessment and Adjustments*, Vol. 72, John Wiley & Sons.

Rudžionienė, K. and Brazdžius, Š. (2023), "Cost and Benefits of Sustainability Reporting: Literature Review", *Sustainable Performance in Business Organisations and Institutions: Measurement, Reporting and Management*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, p. 56, doi: 10.15611/2023.83.1.03.

Sahin, Ö., Bax, K., Paterlini, S. and Czado, C. (2023), "The pitfalls of (non-definitive) Environmental, Social, and Governance scoring methodology", *Global Finance Journal*, Vol. 56, p. 100780, doi: 10.1016/j.gfj.2022.100780.

Samet, M., Mouakhar, K. and Jarboui, A. (2018), "Exploring the relationship between CSR performance and financial constraints: empirical evidence from European firms", *Review of Social*

Economy, Vol. 76 No. 4, pp. 480–508, doi: 10.1080/00346764.2018.1480795.

Sandberg, H., Alnoor, A. and Tiberius, V. (2023), "Environmental, social, and governance ratings and financial performance: Evidence from the European food industry", *Business Strategy and the Environment*, Vol. 32 No. 4, pp. 2471–2489, doi: https://doi.org/10.1002/bse.3259.

Sarangi, G.K. (2021), "Resurgence of ESG investments in India: Toward a sustainable economy", ADBI Working Paper, No. 1284.

Siegel, D.S. and Vitaliano, D.F. (2007), "An empirical analysis of the strategic use of corporate social responsibility", *Journal of Economics and Management Strategy*, Vol. 16 No. 3, pp. 773–792, doi: 10.1111/j.1530-9134.2007.00157.x.

Silva, F. and Carreira, C. (2012), "Measuring firms´ financial constraints: a rough guide", *Notas Económicas*, No. 36, doi: 10.14195/2183-203X_36_2.

Singhal, N. (2023), "Stakeholders sustainable development goals (SDGs) prioritization", *Business Strategy and Development*, Vol. 6 No. 4, pp. 986–990, doi: 10.1002/bsd2.292.

Singhania, M. and Chadha, G. (2023), "Impact of debt on sustainability reporting: a meta-analysis of the moderating role of country characteristics", *Journal of Accounting Literature*, doi: 10.1108/JAL-09-2022-0099.

Singhania, M. and Gupta, D. (2024), "Impact of Environmental, Social and Governance (ESG) disclosure on firm risk: A meta-analytical review", *Corporate Social Responsibility And Environmental Management*, doi: 10.1002/csr.2725.

Singhania, S., Arora, A. and Sardana, V. (2024), "A win-win situation: uncovering the relationship between CSR reporting and financial performance in Indian companies", *International Journal of Law and Management*, Vol. 66 No. 2, pp. 216–235, doi: 10.1108/IJLMA-05-2023-0126.

Stanley, T.D. and Doucouliagos, H. (2012), *Meta-Regression Analysis in Economics and Business*, Routledge.

UN. (2016), "Transforming our world: The 2030 agenda for sustainable development.", *The 2030 Agenda for Sustainability (Vol. 70)*, available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf.

UN DESA. (2024), "UN Goal 12 Ensure sustainable consumption and production patterns", *UN SDG*, available at: https://sdgs.un.org/goals/goal12 (accessed 24 December 2024).

Wang, Q., Dou, J. and Jia, S. (2016), "A meta-analytic review of corporate social responsibility and corporate financial performance: The moder ating effect of contextual factors", *Business & Society*, Vol. 55 No. 8, pp. 1083–1121, doi: https://doi.org/10.1177/0007650315584317.

Whelan, T., Atz, U., Holt, T.V. and Clark, C. (2021), "ESG and financial performance":, *NYU Stern Center for Sustainable Business and Rockefeller Asset Management.*, doi: https://doi.org/10.1111/j.1745-6622.2003.tb00466.x.

"Who Cares Wins-The Global Compact Connecting Financial Markets to a Changing World." (2004), , UN Global Compact.

Wilson, D.B. and Lipsey, M.W. (2001), "The role of method in treatment effectiveness research: evidence from meta-analysis.", *Psychological Methods*, Vol. 6 No. 4, p. 413.

Zhang, D., Wang, C. and Dong, Y. (2023), "How Does Firm ESG Performance Impact Financial Constraints? An Experimental Exploration of the COVID-19 Pandemic", *European Journal of Development Research*, Vol. 35 No. 1, pp. 219–239, doi: 10.1057/s41287-021-00499-6.

Zheng, L., An, Q. and Yang, M. (2024), "Climate change, corporate risk-taking, and financialization: evidence from Chinese A-share non-financial listed companies", *Environment, Development and Sustainability*, pp. 1–24, doi: https://doi.org/10.1007/s10668-024-05045-y.