

Influence of environmental social governance (ESG) disclosure on the financial performance (FP) of real estate investment trusts (REITs): A review



Olumide Samson Ola^{ab}   | Mohd Lizam^a 

^aDepartment of Real Estate Management, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, Johor, Malaysia.

^bDepartment of Estate Management, Faculty of Environmental Sciences, University of Jos, Plateau State, Nigeria.

Abstract Environmental, social and governance (ESG) reporting has become a central lens for assessing value creation and risk in real estate capital markets. This systematic review synthesises empirical evidence on the linkages between ESG disclosure and the financial performance (FP) of real estate investment trusts (REITs) over 2016–2024. A transparent protocol guided by ROSES and PICOC was applied to studies retrieved from Scopus, Web of Science and Google Scholar, with quality appraisal using MMAT. After screening 8,766 records, 28 studies covering 38 countries were retained for content analysis. The evidence indicates a predominantly positive association between ESG disclosure and FP: approximately two-thirds of reviewed studies ($\approx 68\%$) report favourable links across accounting- and market-based metrics, while about 16% report negative and 16% mixed effects. The “social” and “governance” pillars are most frequently and substantively disclosed, whereas the “environmental” pillar is least reported and, in several studies, exhibits non-linear or initially adverse financial effects before turning positive at higher ESG intensities. Geographically, evidence is concentrated in developed markets (the United States, the United Kingdom, and Australia), with limited but emerging coverage in Asia and persistent gaps in Africa. Methodologically, linear panel regressions dominate, though a subset employs non-linear specifications (e.g., U-shaped relationships) that help reconcile disparate findings by highlighting threshold effects and short-run cost frictions. Overall, the balance of evidence supports ESG disclosure as a value-enhancing strategy for REITs, particularly via social and governance dimensions, while underscoring the need for deeper, sector-specific analyses of environmental investments, standardised disclosure metrics, and expanded coverage of under-studied regions. These insights inform investors, managers and policymakers seeking to align sustainability reporting with financial outcomes in listed real estate.

Keywords: CSR, ESG-REIT, SDG, value creation, sustainable investment

1. Introduction

The real estate sector has a substantial environmental footprint, accounting for roughly 40% of global energy consumption (Morri et al., 2021). In response, successive sustainability frameworks—responsible property investment (RPI), corporate social responsibility (CSR), and, more recently, environmental, social and governance (ESG)—have been advanced to guide practice and investor evaluation. Although real estate investment trusts (REITs) were originally structured to deliver risk-adjusted returns from income-producing property, sustainability considerations are increasingly integrated alongside traditional profit objectives. Scholars and policymakers therefore encourage REITs to move beyond narrow shareholder-value maximisation by adopting CSR practices and disclosing ESG performance in ways aligned with the Sustainable Development Goals (Nollet et al., 2016). Many jurisdictions now promote or require ESG reporting, prompting REITs to measure, manage, and communicate their environmental and social externalities (Feng & Wu, 2023). Perceptions within the socially responsible investment community remain varied; some evidence suggests REITs are viewed as less aligned with socially responsible investing than open-ended funds (Bilgehan, 2021). Notwithstanding these perceptions, ESG adoption and disclosure in the REIT sector have expanded markedly since the mid-2000s, and a growing empirical literature examines links between ESG activities and both financial and non-financial outcomes, particularly in the United States, the United Kingdom, China, and Australia (Erol et al., 2023; Feng & Wu, 2023; Morri et al., 2021).

Recently, research has attributed the growing importance of ESG disclosure and its impact on firms, including REITs, to increasing regulatory requirements and investor expectations. While the Institutional investors are increasingly demanding ESG and climate risk disclosures on one hand, they are also actively engaging with portfolio companies to improve transparency, which is a testament to the increasing demand for sustainable investment (Ilhan et al., 2023). The increasing trend is becoming more encompassing as it extends beyond environmental to include governance and social factors, with climate change risk



assessment becoming a key focus (Matos, 2020). This has contingent the capacity and ability of REITs to attract long-term capital upon their ability to integrate ESG practices into strategic decision-making and disclose such reports credibly.

The linkage between the ESG disclosure and the financial performance of REITs can be viewed through the lens of both the Efficient Market Hypothesis (EMH) and the Stakeholder Theory, respectively. When viewed through the perspective of Efficient Market Theory, the semi-strong form of the EMH posits that financial markets quickly and accurately reflect all publicly available information in stock prices (Fama, 1970). Under this framework, the ESG initiatives of REITs would be immediately reflected in their market value if investors found such information relevant and credible. Stakeholder theory, on the other hand, posits that firms create long-term value by addressing the interests of multiple stakeholders, not just shareholders (Freeman, 2010). By disclosing ESG initiatives, REITs will strengthen trust and legitimacy among investors, tenants, regulators, and communities, which will lead to an increase in their financial resilience. Nevertheless, the degree to which these theoretical benefits translate into measurable financial outcomes in the REIT sector remains contested, warranting empirical clarification.

ESG disclosure has become widespread as firms—including REITs—face regulatory and stakeholder pressure to report on corporate responsibility initiatives, climate-change mitigation, and contributions to sustainable cities and communities, consistent with SDGs 11 and 13. In tandem, a substantial empirical literature has examined whether—and to what extent—such disclosure influences the financial performance (FP) of listed equities, including REITs.

Despite expanding literature, important research gaps persist. Recent studies on the relationship between ESG disclosure and financial performance in the real estate sector, particularly for REITs, have yielded inconsistent outcomes. Studies have, however, consistently shown that social factors have positive effects on REIT performance, while environmental factors have significant but unclear impacts (Zheng & Lee, 2025). In other instances, while the environmental pillar is well-researched, social and governance aspects require further investigation (Robinson & McIntosh, 2022). In another study, positive links were found between environmental factors and financial performance, but negative associations with governance factors (Morri et al., 2024). These mixed findings highlight the complexity of ESG impacts in real estate and underscore the need for further research to clarify the ESG-performance nexus in this sector

This review synthesises global evidence to identify points of convergence and divergence, and to draw sector-specific implications for REITs. We compare methodological approaches, ESG disclosure measures, FP metrics, and regional contexts to appraise the direction and robustness of reported effects. By integrating findings across countries and study designs, the review offers an informed assessment of the relationship between ESG disclosure and REIT financial performance and outlines priorities for future research and policy.

2. Methodology

This study used a transparent and rigorous methodology to conduct this systematic literature review. Following the guidelines of the ROSES, we initiated the SLR process by formulating a research question via the PICOC method. The PICOC, which represents the “Problem or Population, Sample, Intervention, Comparison (if any), Outcome, and Context”, was utilised to develop a suitable approach for document retrieval through identification, screening, and eligibility assessment for inclusion, as shown in Table 1. We evaluated each selected paper's quality on the basis of the criteria established by Hong et al. (2018).

Table 1 PICOC table of study scope.

Concept	Definition	SLR application
Population/Sample	The company (REITS)	REITs own and manage various income-producing properties, necessitating research on ESG disclosure and REITs' “Financial Performance
Intervention	ESG Disclosure	The availability of ESG information is crucial for investors. We will conduct a systematic literature review to determine ESG–REITs' financial performance disclosure.
Comparison	NON	
Outcome	Increased/decreased financial performance	We reviewed articles related to ESG- REITs to determine the methodology used to come up with positive/negative financial performance literature.
Context	Globally	The geographical distribution of ESG and Financial performance studies, trends in ESG and financial performance studies

2.1. Formulation of the research question

We followed the PICOC approach developed by Mengist et al. (2020) to develop our research question for this study. With the PICOC, five key ideas were generated: (1) the problem or population/sample, (2) the intervention, (3) the comparison (if one exists), (4) the outcome and (5) the context. Table 1 defines each context. On this basis, we formulate our research question: “What are the outcomes of research trends in ESG disclosure and the financial performance of REITs across the world?”

The three key terms concerning the research inquiries are “ESG”, “ESG disclosure”, and “Financial Performance” (FP). An online lexicon was used to find alternative expressions for these words. To enhance our search, we consider closely related terms such as “CSR”, “SDG”, “effect”, “awareness”, “consequences”, “firm performance”, “financial result”, and “financial outcome”. We used search techniques such as field code functions, phrase searching, wildcards, truncation, and Boolean operators to analyse these keywords in the three chosen databases. The study utilised databases of Web of Science, Scopus as well as Google Scholar because of their extensive coverage of high-quality, peer-reviewed research literature. While the Scopus and Web of Science databases are known for their detailed indexing of various reputable multidisciplinary academic journals, Google Scholar, even though it does not have publisher lists or journal types, is nevertheless a valuable resource for accessing citations not included in other databases (Yang & Meho, 2006). The screening of articles was performed on the basis of the already established inclusion and exclusion criteria set in Table 2.

The initial search generated 8,766 articles from the three databases. (Scopus, 7721; Web of Science, 961 and Google Scholar 84). Duplicate articles were removed, and exclusion criteria were applied, resulting in 1388 articles. On the basis of the titles and abstracts, 163 articles remained. The main body reading and removal of duplicate articles left 43 articles. After critical evaluation and quality assessment, 37 articles remained. Finally, 28 articles from 2016--2024 were relevant for the final assessment and content analysis. The key findings were identified and linked among selected studies to identify the convergence and divergence in their conclusions. The flow diagram for the systematic search is presented in Figure 1.

Table 2 Inclusion and exclusion criteria.

Criteria	Decision
when the article is peer-reviewed and scientific	Included
The language is English	Included
If the keywords exist as a whole, as a title, or in an abstract section	Included
The article that addressed at least one ESG indicator	Included
Articles that addressed financial performance indicators	Included
Duplicated papers within the search documented	Excluded
Review paper or meta-analysis paper	Excluded
A paper published before 2016	Excluded
Book chapter	Excluded
Technical reports and online presentations	Excluded

Source: Adapted and modified from Mengist et al. (2020).

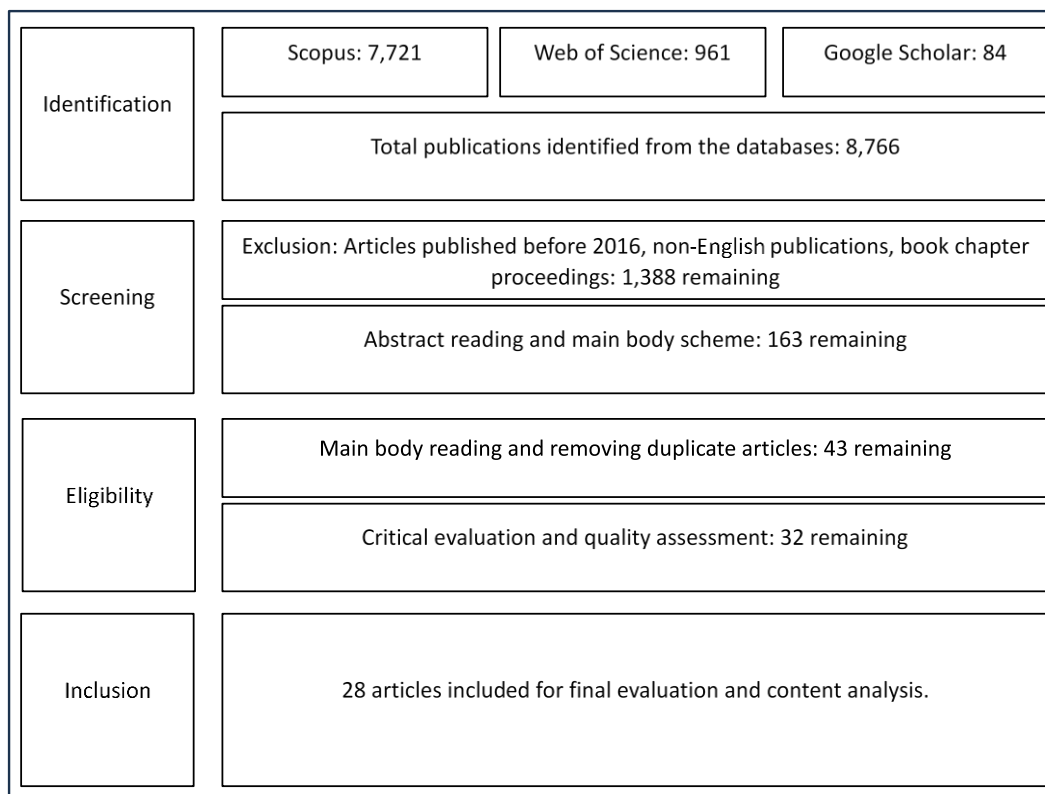


Figure 1 Flow diagram of the database search for publications for systematic review.

Source: Adapted and modified from Mengist et al. (2020).



3. Results and Discussion

Studies worldwide linking ESG to the financial performance of REITs have gained special recognition across many organisations, such as the United Nations, government parastatals and corporate organisations around the globe. This is because findings and recommendations from previous studies have positively served as blueprints for many governments, the United Nations and corporate organisations to ascertain their sustainability activities. Many of these studies were reviewed to link their methodologies and findings, and their outcomes are as follows:

Morri et al. (2021) examined the association between REITs' environmental intensity ("greenness") and financial performance across 12 European countries. Financial performance was proxied by return on equity (ROE) and return on assets (ROA), and the authors estimated ordinary least squares (OLS) models. The results indicate a positive association between greenness and accounting-based performance, suggesting that European REITs with stronger environmental profiles tend to achieve superior ROE and ROA. These findings are broadly consistent with prior evidence (Alareeni & Hamdan, 2020; Brounen & Marcato, 2018; Feng & Wu, 2023).

Using a broader UK corporate sample, Nollet et al. (2016) investigated linear and non-linear links between ESG performance and corporate financial performance (CFP) with dynamic panel data techniques. The linear specification yielded a significant negative association between the social pillar and return on capital, mirroring results reported for Latin America by Dugue-Grisales and Aguilera-Caracuel (2021). However, when non-linearity was modelled, a U-shaped relationship emerged, implying that while ESG investments—particularly in social initiatives—may be associated with lower returns at low levels, the relationship turns positive beyond a threshold. This non-linear pattern aligns with evidence from Malaysia (Shabbir et al., 2020).

Another study by Feng and Wu (2023) examined the relationship between ESG disclosure and REIT debt financing with respect to firm value in China. The information recorded in the S&P Global as provided by the Global Real Estate Sustainability Benchmark (GRESB), was used to examine the relationship between REITs' financial flexibility, as indicated by the ratio of nonsecured debt to total debt and long-term debt to total debt. The study employed a regression model and conducted t t-tests to determine whether the relationship was significant. The findings indicate that REITs with greater ESG disclosure levels tend to have reduced debt costs, improved credit ratings, and a higher ratio of unsecured debt to total debt. In essence, the study demonstrated a positive link between ESG disclosure and firm value, which is influenced by the financing of REIT debt. This finding aligns with similar studies conducted by Brounen & Marcato (2018) in the U.S. and Albitar et al. (2020) in the UK. In the same vein, Brounen and Marcato (2018) employed panel regression to analyse the linkage between ESG disclosures and REITs in the U.S. market between 2011 and 2018 via ESG data from the Thomson Reuters and KLD databases. The analysis focused on firm-specific returns within an asset pricing framework, utilising a five-factor model as a reference point. The findings revealed that higher ESG ratings are positively linked to improved performance of REITs in public real estate markets; this suggests that ESG factors play a significant positive role in investment outcomes. This result is consistent with the linear findings of Morri et al. (2024), who reported that the positive association between ESG disclosure and corporate financial performance (CFP) improved corporate business growth. In a multinational inquiry, Erol et al. (2023) investigated the empirical link between ESG investing and the financial performance of REITs in Australia, the UK, the US, Japan and Canada. The study utilised the PVAR-Granger causality model and a fixed-effects panel data model from the dataset of 234 ESG-rated REITs across the selected countries from 2003--2019. The outcome of the analysis shows that the S-investing components of ESG have a significant positive relationship with the FP of REITs. Nonetheless, the investigation did not delve into the impact of environmental (E) and governance (G) investing in ESGs on the financial performance of REITs. The positive outcome of S investing aligns with the research of Wellalage et al. (2022), where the disclosure of environmental efficiency has a positive correlation with financial indicators only across Asian countries.

Park (2017) investigated 175 emerging Korean firms from 2010--2012 via panel regression analysis. The results showed that CSR has positive effects on long-term firm performance and provides direct and indirect value to firms through positive feedback on their reputation. The positive association in this research is consistent with the research of Nollet et al. (2016) and Pu (2023), where the linear model produced a positive association between ESG performance and corporate financial performance. Another similar study was carried out by Duque-Grisales and Aguilera-Caracuel (2021) to determine the relationship between ESG scores and the financial performance (FP) of firms in Latin American countries for a period of 5 years (2011--2015). To achieve the study objective, the research used correlation and multiple regression models. The outcome of the research revealed that the score of ESG is significantly negatively associated with the financial performance of Latin American firms. This implies that ESG initiatives place a greater burden on firms in Latin America. Using panel data analysis, Shabbir et al. (2020) analysed the correlation between "Government", which is an ESG subcomponent, and a firm's corporate performance (CP) in Malaysia. The outcome of the research shows that there is a U-shaped association between "G" and companies' performance. The result of the U-shaped association indicated that initially, with an increase in the government score of the ESG subcomponent, firms' FP decreases (negatively related); however, in the long run, it ultimately improves firms' financial performance. This result indicated mixed findings where a negative association was initially found, which was in line with the nonlinear approach (Nollet et al., 2016; Pu, 2023). The findings, however, show a positive association in the long run, which is consistent with the linear approach of Agarwala et al. (2024), Nollet et al. (2016), and Park (2017), where ESG

disclosures positively improved firm financial performance. The focus of the research is, however, on the government aspect of ESG alone without considering the environmental and social aspects of ESG.

Another study of the linkage between corporate sustainability performance (CSP) and corporate firm performance (CFP) performed by Jha and Rangarajan (2020) utilised the Granger causality test for causal linkage analysis from a sample of the top 500 Indian firms for a period of 11 years (2008–2018). The study's outcome returns insignificant results between the variables and, therefore, shows no evidence of a causal linkage between the CSP and CFP of top Indian firms. The outcome of the study literally means that investing in sustainability by Indian firms is not worthwhile, as it does not impact their financial indicators in any way. Alareeni and Hamdan (2020) utilised panel regression analysis (PRG) to analyse the relationship between ESG factors and the performance of listed firms in the US S&P 500 index between 2010 and 2018. The study utilised ROA and ROE as the firm's measure of performance. The results revealed that ESG disclosure maintained a positive association with ROA and ROE, and this finding was therefore consistent with the findings of Brounen and Marcato (2018) and Morri et al. (2021), where positive linkages were found with firm performance. The study of Albitar et al. (2020) also utilised panel data regression analysis to determine the correlation between ESG disclosure and FP in UK firms before and after the implementation of integrated reporting. FP was measured via profitability and stock returns, with a focus on post-IR implementation periods. The results revealed that ESG disclosure has a positive influence on Firm Performance (FP), with stronger effects observed after the implementation of Integrated Reporting (IR). The outcome of the research is similar to that of Mohammad and Wasiuzzaman (2021) in Malaysia, where ESG performance correlates positively with financial performance after controlling for competitive advantage. A study by Bilgehan (2021) used panel data analysis of Pedroni and Kao and ARDL cointegration tests to determine the relationship between stock price and financial failure in Istanbul, Turkey, for a period of 10 years (2010–2019). The research outcome shows mixed findings regarding the relationship, with some indicators showing significant correlations while others do not. Although the outcome of this research contributes to understanding the dynamics between financial failure and stock prices, it does not contribute to ESG REIT research. Research by Mohammad and Wasiuzzaman (2021) utilised both a correlation matrix and cluster regression and probed the effects of firms' ESG disclosure on FP in Bursa, Malaysia. The outcome of this research shows that a unit increase in the ESG discourse of Malaysian firms leads to a corresponding 4% increase in the performance of listed firms. This means that there is a positive ESG–firm performance linkage after competitive advantages have been controlled. This finding is consistent with the work of Albitar et al. (2020), who reported a positive association between ESG disclosure and firm performance after the implementation of Integrated reporting among UK firms.

A study by Tahmid et al. (2022) focused primarily linking ESG initiatives impact on firm performance and value. The study utilised a linear generalised least squares (GLS) and fixed effect (FE) model for hypothesis testing on 12-year panel datasets (2008–2020) derived from a dataset of 180 listed firms from 10 economic sectors across 22 European countries. The outcome of the multi-EU country study shows that there is a positive association between ESG initiatives and both firm performance and values across 180 listed firms from 22 EU countries. This finding agrees with similar studies conducted across different countries and firms by Morri et al. (2021) across 12 EU countries and Prabawati and Rahmawati (2022) across ASEAN countries, where ESG disclosures were found to improve firm financial performance. In their research, via panel data regression analysis, Giannopoulos et al. (2022) investigated whether there exists a form of linkage between ESG initiatives and the financial performance of listed companies in Norway for a period of 10 years (2010–2019). The study obtained ESG scores from Thomson Reuters Eikon and utilised ROA and TOBI's Q as proxies for financial performance (FP). The outcomes of the study revealed mixed findings. Whereas findings from Tobin's Q have indicated a strong, positive significant relationship between ESG initiatives and financial performance, the result from ROA shows a negative association between the two phenomena. The mixed findings can be a result of the application of different financial metrics in the same research. This mixed finding is, however, consistent with research by Agarwala et al. (2024) in India, Pu (2023) in China and Shabbir et al. (2020) in Malaysia, where the findings returned mixed results. Using panel regression analysis, Pu (2023) examined the relationship between ESG activities and corporate performance (CF) in 232 Chinese firms for a period of 9 years (2012–2020). The outcome of the analysis showed an inverse U-shaped relationship between these two phenomena. The U-shaped relationship translated into both positive and negative associations. This study implies that initially, there will be a negative association between ESG activities and 232 listed Chinese firms until a certain threshold is reached; thereafter, the relationship will become positive. These mixed findings in this research are consistent with similar research with a U-shaped relationship (Agarwala et al., 2024; Nollet et al, 2016; Shabbir et al., 2020)

The study of how environmental efficiency (EE) influences the financial performance (FP) of SMEs across 13 Asian countries was performed by Wellalage et al. (2022). To achieve the study objective, a 10-year panel data regression analysis spanning the period 2011–2020 was used. Although the findings revealed a positive relationship between EE and FP, they are consistent with the findings of Erol et al. (2023), who reported that investing in ESG positively correlated with FB. The study, however, cannot be said to be fully ESG related, as the social (S) and governance (G) aspects of ESG were not discussed. Notably, environmental efficiency (EE) is only an aspect of the E of an ESG. In another study, Chen and Xie (2022) applied the difference-in-differences (DID) technique to analyse the impact of ESG disclosure on corporate financial performance (CFP) in China for 20 years (2000 and 2020). To solve the problem of endogeneity observed in the data, a staggered difference-in-differences (DID) technique was applied, coupled with the parallel trend test (PTT) and Goodman-Bacon decomposition (G-BD). The findings not

only reveal a positive association between ESG disclosure and CFP but also a favourable effect between the two variables. This finding, therefore, is consistent with similar research (Alareeni & Hamdan, 2020; Albitar et al., 2020; Brounen, & Marcato, 2018; Feng & Wu, 2023; Morri et al., 2021). Prabawati and Rahmawati (2022) investigated the link between ESG scores and firm values in selected Asian countries for 11 years (2010–2020) by employing panel regression analysis to establish the relationships among the variables. The outcome of the regression reveals a significant positive relationship between ESG scores and firms' values. This finding is therefore consistent with other similar cross-country studies (Morri et al., 2024; Morri et al., 2021; Prabawati and Rahmawati, 2022). Another study by Kumar and Firoso (2022) employed ordinary least squares (OLS) multivariate regression to examine whether ESG disclosures from a corporate sustainability perspective significantly influenced accounting-based FP values in the UK between 2011 and 2020. The study outcome revealed a positive association between ESG disclosure and a firm's FP measured by accounting-based metrics. This outcome agreed with the findings of similar studies performed in the U.S. and China (Devine et al., 2023; Wang & Jin, 2023).

Using a dynamic panel data (DPD) regression technique, Agarwala et al. (2024) carried out a study in India to determine the relationship (linear and nonlinear) between ESG disclosure among 305 listed companies on the NSE and the FP. The disaggregated ESG study outcome shows a positive linear association between social (S) and governance (G) and all the performance indicators. This outcome is consistent with similar research by Erol et al. (2023) and Wellalage et al. (2022), where disclosure of S investing and environmental efficiency (EE) has a positive association with the financial performance of firms in the USA, the UK, Australia, Canada, Japan and ASIAN countries. The outcome of the environmental (E) subcomponent has a U-shaped relationship with market performance indicators. The U-shaped outcome means that investment in the environmental component of ESG in the short run will yield a negative outcome on the firm's FP, whereas the table will eventually turn in the long run. This outcome is consistent with previous studies (Nollet et al., 2016; Pu, 2023; Shabbir et al., 2020), where a mixed result with a U-shaped relationship was found. In another study, Rosley et al. (2023) employed a fixed effect model to analyse the correlations between ESG disclosure and Company Performance (CP) in Malaysia's Top 100 Index for a period of 6 years (2014–2020). The study outcome of the panel regression analysis showed mixed results, with government disclosure having a significant positive association with CP, whereas ROA did not positively correlate with the social and environmental components of ESG. This means that environmental and social factors do not substantially impact the performance of companies in the Bursa Malaysia Top 100 Index. Findings from this research are in agreement with previous studies by Agarwala et al. (2024) that produced similarly mixed findings in India. In a similar sustainability study, Mohanty et al. (2023) examined the relationship between corporate sustainability reporting (CSR) as an ESG factor and FP in the emerging economy of India. In this study, a regression analysis was used to determine the influence of CSR on firm performance using ROA and the market-book ratio (MBR) as FP indicators. The study outcome showed a positive and significant relationship between the CSR and FP indicators, which is consistent with the findings of previous studies (Alareeni & Hamdan, 2020; Albitar et al., 2020; Wang & Jin., 2023) in the U.S., the UK and China.

By utilising US market data, Devine et al. (2023) explore the causal linkage between sustainability disclosure and FP in real estate by distinguishing between private and public real estate companies in the U.S. This study employs panel regression analysis to scrutinise the association between sustainability disclosure and financial performance. The outcome of the research showed a positive relationship between sustainability disclosure and FP across both the public and private real estate sectors in the U.S. This finding indicates that entities with increased sustainability disclosure levels tend to achieve superior financial results in the U.S. The study outcome is similar to that of Wang and Jin (2023) in China, who reported a positive association between ESG performance and CSP. Wang and Jin (2023) employed quantitative analysis via a fixed-effects model to determine the kind of association between ESG performance and corporate sustainable development (CSP) in Chinese listed companies from 2011–2020. The outcome of the analysis revealed a positive relationship between ESG performance and CSP is positive. This finding is therefore consistent with a similar study (Devine et al., 2023). In their latest study, Morri et al. (2024) employed a fixed effects regression model to analyse the connection between ESG performance and financial performance within the real estate sector in the U.S., Hong Kong and China via ESG data from 680 publicly listed real estate companies between 2011 and 2018. The study revealed a positive link between ESG disclosure and financial performance in real estate investments. The positive link between ESG disclosure and financial performance found in the present study is in line with the findings of previous similar studies (Morri et al., 2021; Prabawati & Rahmawati, 2022).

Feng et al. (2022) examined the effects of climate risk on commercial real estate, with a specific focus on US REITs. A correlation analysis between US REITs' firm value and level of exposure to climate risk was performed to determine the impact of climate risk factors on commercial real estate. The results show that climate risk significantly negatively impacts commercial real estate performance, as evidenced by decreases in property values, rental income, and occupancy rates in areas prone to climate-related hazards. This study highlights the urgent need for real estate investors and policymakers to incorporate climate risk considerations into investment decisions and regulatory frameworks. ESG metrics were not studied but rather single out the environmental aspects of ESGs.

On the basis of these studies, the influence of ESG (environmental, social, and governance) disclosure has generally been found to be positive. While some studies reported negative effects and others presented mixed results using similar methodologies, only one study, conducted by Jha and Rangarajan (2020), found no evidence of either a positive or negative

relationship between ESG disclosure and financial performance. This lack of relationship could be attributed to differences in the methodologies employed.

3.1. Summary of empirical studies

A summary of the empirical findings and methodologies used across various countries and continents is presented. Table 3 presents a summary of articles with positive ESG REIT financial performance outcomes. Table 4 presents a summary of articles with negative and insignificant ESG-financial performance outcomes, whereas Table 5 presents a summary of reviewed articles with mixed findings concerning the ESG-financial performance relationship. In Table 6, a summary of the empirical studies across different countries with negative, positive and mixed findings is presented.

Table 3 Articles with positive ESG REITs financial performance outcome.

Authors	Objective	Methodology	Key findings	Country	Outcome
Giannopoulos, et al., 2022	Investigate the linkage between ESG initiatives, and the financial performance of companies listed in Norway	Panel data regression analysis	Tobin's Q have a strong positive significant relationship between ESG initiatives and financial performance, ROA shows a negative association	Norway	Positive
Erol et al., 2023	To investigate the empirical link between ESG investing and the Financial Performance (FP) of REITs in developed economies.	PVAR-Granger causality model and a fixed-effects panel data model were used on the dataset of 234 ESG-rated REITs across the selected countries	S investing of ESG positively correlates with REITs' FP in developed economies. While E and G investing were not examined	USA, the UK, Australia, Canada, Japan	positive with S investing
Feng & Wu, 2023	To determine the relationship between ESG disclosure and REIT debt financing of firm value in China	The study employed a regression model and conducted a t test statistics to determine the significance of the relationship	The study showed there is a positive link between ESG disclosure and firm value.	Different countries in Asian	Positive firm value,
Prabawati, & Rahmawati, 2022	To investigate the link between ESG scores and firm values in selected Asian countries	Regression analysis was used, and firm values using TOBIN Q.	The outcome of the regression shows a significant positive relationship between ESG scores and firms 'values	ASEAN region	Positive
Mohanty et al., 2023	To study the connection between CSR as an ESG factor and financial performance (FP) in the emerging economy of India	Regression analysis was performed to measure the influence of CSR on firm performance using ROA and Market-Book Ratio MBR as FP indicators	The result showed that CSR has a positive relationship with FP indicators.	India	Positive.
Chen & Xie, 2022	To analyse the impact of ESG disclosure on Corporate Financial Performance CFP) in China.	A staggered Difference-in-Differences (DID) technique	A positive association between ESG disclosure and CFP	China	Positive
Albitar et al., 2020	To determine the correlation between ESG disclosure and FP in UK firms	Panel data regression models. FP was measured using profitability and stock return focusing on post-IR implementation periods.	ESG disclosure positively influences firm performance, with stronger effects observed after the implementation of Integrated Reporting.	UK	Positive
Morri et al., 2021	To investigate the relationship between the REITs' "greenness" and FP across 12 European countries	ROE and ROA were used as proxies for measuring REITs FP and Ordinary Least Squares (OLS) regression was performed.	The study's outcome shows a positive correlation between greenness and FP.	12 European countries	Positive

Alareeni & Hamdan, 2020	To investigate the relationship between ESG factors and the performance of listed firms in the US S&P 500 index	Panel regression analysis.	A positive correlation between ESG factors and firm performance,	United States (US)	Positive
Wang & Jin, 2023	To probe the relationship between ESG performance and Corporate Sustainable Development Performance (CSP) in China	A fixed-effects model with Chinese A-share listed companies from 2011 to 2020	There exists a positive relationship between ESG performance and CSP	China	Positive
Brounen, & Marcato, 2018	To examine the relationship between ESG scores and effects in REIT markets.	Regressions on both total and partial returns for the firm I (return) over the 2011-2018 period were performed. ,	The findings show that higher ESG ratings positively improved REIT's performance, especially in public real estate markets	US	Positive
Devine et al., 2023	To determine the causal linkage that exists between sustainability disclosure and financial performance in real estate domain,	Panel regression analysis	There exists a positive relationship between sustainability disclosure and Financial Performance (FP) across both public and private real estate sectors in the US. ,	US	Positive
Mohammad & Wasiuzzaman, 2021	To investigate the effects of firms' ESG disclosures on <i>Firm Performance</i> (FP)in Bursa Malaysia	Correlation matrix and cluster regression analysis	There is a positive relationship between ESG disclosure and firm performance after competitive advantages have been controlled	Malaysia	Positive across firms
Kumar & Firozo, 2022	Examine whether accounting-based FP values ESG disclosures from a corporate sustainability perspective	OLS multivariate regression	A positive relationship between ESG disclosures and accounting-based FP,	India	Positive
Wellalage et al., 2022	To determine the influence of Environmental Efficiency (EF) on Firm Finance (FF)	Panel Regression analysis	Environmental efficiency improved firm performance	Asian countries	Positive
Morri et al., 2024	To analyse the connection between ESG performance and Financial Performance (FP) within the real estate sector	fixed effects regression model	ESG disclosure improved firm performance	US, Hong Kong and China	Positive

Table 4 Articles with negative and insignificant ESG-financial performance outcomes.

Authors	Objective	Methodology	Findings	Country	Outcome
Feng et al., (2022)	To gauge the effects of climate risk on US commercial REITs.	correlation analysis was performed between US REITs' firm value and level of exposure to climate risk.	The effect of Climate risk on commercial real estate performance is negative and significant as evidenced by decreases in property values,	USA	negative to climate risk

Duque-Grisales & Aguilera-Caracuel, 2021	To investigate the relationship between ESG scores and financial performance (FP) of firms in Latin American	Correlation and Multiple regression analysis model	rental income, and occupancy rates ESG score has a significant negative correlation with the Financial Performance of Latin America	Brazil, Chile, Colombia, Mexico and Peru	negative
Jha & Rangarajan, 2020	To study the linkage between "Corporate Sustainability Performance" (CSP) and "Corporate Firm Performance" (CFP)	Granger causality test	The outcome of the study shows insignificant results and shows there is no evidence of a causal linkage between CSP and CFP of top Indian firms	India	No evidence

Table 5 Articles with mixed results of ESG-financial performance outcome.

	Objective	Methodology	Findings	Country	Outcome
Nollet et al., 2016	To determine the associations (linear and nonlinear) between Corporate Financial Performance (CFP) and ESG	Dynamic panel data analysis	The linear model from the study shows there is a significant negative relationship while the nonlinear model however returned a U-shaped	UK	Mixed result
Shabbir et al., 2020	To analyse the correlation between "Government" - a component of ESG and a firm's Corporate Performance (CP).	Panel data regression analysis	The outcome of the research shows that there is a U-shaped association between the "G" and corporate' performance	Malaysia	Mixed result
Pu, 2023	To examine the relationship between ESG activities and Corporate Performance (CP) of Chinese firm	Panel regression analysis	The outcome of the research shows that there is a U-shaped association between ESG activities and Corporate Performance (CP)	China	Mixed result
Erol et al., 2023	To empirically investigate the link between ESG investing and the REIT's FP	PVAR-Granger causality model and a fixed-effects panel data model	The outcome of the analysis shows that S-investing components of ESG have a significant positive linkage with REITs FP	USA, Australia, UK, Canada Japan.	Mixed result
Rosley et al., 2023	To analyse the correlations between ESG disclosure and Company Performance (CP)in Malaysia.	Fixed effects regression model	The analysis shows mixed results with government disclosure having a significant positive association with CP whereas ROA did not positively correlate with social and environmental components of ESG	Malaysia	Mixed
Bilgehan, 2021	To determine the relationship between stock price and financial failure of REITs in Istanbul Turkey .	Panel data analysis of Pedroni and Kao and ARDL cointegration tests	The outcome shows mixed findings. Some indicators show significant correlations while others do not	Turkey	mixed findings for financial failure
Omokhomion, 2023	To determine the relationship between REIT's Corporate Governance (CG) and investment decisions.	OLS, fixed effect and Random effect regression	The outcome shows a positive correlation between Integrated Corporate Governance Index (ICGI) and ROA and ROE in the UK but not in SA and Nigeria	United Kingdom, South Africa, Nigeria	mixed result



Table 6 Empirical studies with negative, positive and mixed results across countries.

Continents/countries	Number of Studies	Positive outcome	Negative outcome	Mixed outcome
USA	07	06	01	00
China	04	03	00	01
India	02	02	00	00
Japan	01	01	00	00
Malaysia	03	02	00	01
UK	05	03	00	02
Brazil	01	00	01	00
Chile	01	00	01	00
Colombia	01	00	01	00
Peru	01	00	01	00
Hong Kong	01	00	01	00
Australia	02	02	00	00
Canada	02	02	00	00
Nigeria	01	00	00	01
South Africa	01	00	00	01
Norway	01	01	00	00
Asian countries	03	03	00	00
12 European countries	01	01	00	00
Total (%)	38(100)	26 (68.4%)	6(15.8)	6(15.8)

3.2. Research trend and implications of empirical findings

The empirical review of recent studies from 2016 to date has revealed different outcomes, and the reasons for the divergence and convergence in the findings are explained. The outcome of the review revealed positive, negative and mixed results from studies that cut across 38 countries worldwide. The trend of the research shows that the U.S. leads with 7 studies, 6 of which show a positive association, the UK with 5 studies, 3 of which show a positive relationship, and China with 4 studies, 3 of which also show a positive relationship between ESG disclosure and FP. A trend from similar studies in Malaysia also indicates that 2 out of 3 studies show a positive association. Overall, the outcome of the review revealed a positive relationship between various ESG studies and various metrics used in measuring FP. This is evident from 17 studies out of the 28 (60.7%) studies, and a positive association was recorded from 26 countries out of 38 globally. When the cross-country nature of some of the research was considered, approximately 68.4% of the studies presented a positive relationship (Alareeni & Hamdan, 2020; Albitar et al., 2020; Brounen & Marcato, 2018; Chen & Zie, 2022; Devine et al., 2023; Feng & Wu, 2023; Giannopoulos et al., 2022; Kumar & Firozo, 2022; Morri, et al., 2021; Morri et al., 2024; Mohammad and Wasiuzzaman, 2021; Tahmid et al., 2022; Mohanty et al., 2023; Wang & Jin., 2023; Wellalage et al., 2022). A review on the basis of the methodology adopted in most of the articles shows that the majority of the studies utilised a mostly linear approach to arrive at either a positive or negative association between various ESG and FP studies (Agarwala et al., 2024; Bilgehan, 2021; Brounen & Marcato, 2018; Devine et al., 2023; Erol et al., 2023; Feng & Wu, 2023; Mohammad & Wasiuzzaman, 2021; Morri et al., 2024; Mohanty et al., 2023; Rosley et al., 2023; Park, 2017; Wang & Jin, 2023; Wellalage et al., 2022). Notably, only a few studies have utilised both linear and nonlinear approaches to identify positive relationships in their mixed findings (Agarwala et al., 2024; Nollet et al., 2016; Park, 2017; Pu, 2023; Shabbir et al., 2020). By implication, ESG disclosure, irrespective of methodology, improved the financial performance of firms. In other words, an empirical study of application ESG disclosure across 26 countries has significantly improved a firm's heritage, boosted the company's reputation and eventually improved its credibility and confidentiality, thus positively impacting the FP of the firms.

Research has also revealed a negative correlation between some ESG studies and firms' FP. This trend was observed in the U.S., where out of 7 ESG-FP studies, one was found to have shown a negative association. Other negative ESG-FP associations were found in studies conducted in North American countries such as Columbia, Peru, Chile, Brazil, and Honk-Kong. Overall, the outcome of the review shows that the relationship between ESG disclosure and firm FP has a negative relationship in 6 studies out of the 28 (21.4%) studies and in 6 countries out of 38 globally. When the cross-country nature of some of the studies was considered, approximately 15.8% revealed an antagonistic relationship globally. This implies that ESG disclosure has led to increasing costs for firms, thereby negatively affecting their financial performance. When considering the negative relationship, ESG disclosure activities can be said to have resulted in high costs for firms' expenditures, thereby reducing the return on investment.

Finally, mixed research trends between ESG disclosure and FP were observed from the UK, where out of 5 studies, 2 returned mixed findings; out of 4 studies from China, 1 showed mixed results; and out of 3 from Malaysia, 1 also showed mixed findings. In Africa, the outcome from one study each from South Africa and Nigeria returned mixed findings concerning the

relationship between ESG performance and the FP. This shows that 15.8% of the studies had mixed findings. Notably, most of these studies utilised a nonlinear approach to arrive at mixed findings (Agarwala et al., 2024; Nollet et al., 2016; 2020; Park, 2017; Pu, 2023; Shabbir et al., 2020). Some of these studies (Agarwala et al., 2024; Nollet et al., 2016; Shabbir et al., 2020) also reported an inverse U-shaped relationship between one component of ESG activities and corresponding FP metrics, which implies that the association between ESG activities and FP in the short run will be negative and become positive in the long run after reaching a certain threshold. In other words, an initial application of ESG disclosure generates a negative relationship due to high-cost implications, but in the long run, the application of ESG improves firms' reputation and integrity, thus positively improving financial performance.

4. Conclusion

Studies of ESG disclosure by real estate investment trusts (REITs) and its association with financial performance (FP) are relatively rare compared with those of other corporate finance studies. This has necessitated further studies to empirically determine the relationship between ESG disclosure and its intricacies in real estate investment trusts (REITs) to contribute positively to environmental sustainability. Most of the findings from past studies have concentrated on the effects of ESG disclosure on the corporate financial performance of firms, and none of these studies produced the same results. While some findings were positive, some studies were negative, and some produced mixed results.

Studies that used linear methodology revealed more positive ESG-FP relationship results than negative associations across the studies. Additionally, among the three components of ESG, both social and governance scores have a significant positive relationship with all measures of financial performance across the studies, whereas the environment component that contributes to most global environmental concerns has a significant negative relationship with financial performance. This call for concern is because the issue of climate action being canvassed globally is subsumed under the environmental component of ESGs. Given little or no attention to environmental disclosure by listed companies could cause a serious setback toward meeting SDGs 11 and 12. The nonlinear results observed in some of the review articles have shown a U-shaped relationship between ESG disclosure and FP across some of the studies, indicating that an initial investment in ESG activities does not translate into financial success in the short run but ultimately leads to the improvement of FP in the long run. The negative associations between ESG performance and FP are caused by management inefficiency and the enormous financial burden associated with environmental management, which does not generate immediate returns as expected. Nonetheless, ESG-FP studies have shown that implementing ESG strategies is more advantageous, as it serves as a reputation booster for companies in the long run, thereby improving their market performance. The study revealed that the focus of most existing research on ESG and financial performance relationships has been on general studies that cut across different industries from different countries without being industry specific, which can be called market-wide observations. The study also revealed that African countries are still behind in terms of ESG disclosure and its relationship with corporate firm performance compared with studies from other continents.

This study, therefore, underscores the need to conduct evidence-based research on the intricacies between ESG disclosure and firm financial performance at the micro level. This is particularly important because most of the existing research spans different sectors of the economy and different countries, making it impossible to pinpoint how ESG disclosure affects the financial performance of a sector of the economy at the microlevel. The findings from this review could therefore act as an eye opener that could propel more research, invoke more academic discussion and provide insight for stakeholders in industries to understand more about the intricacies and various dimensions of the relationship between ESG activities and FP in the real estate sector of the economy even now that most countries are putting needed regulatory frameworks in place for seamless ESG reporting for listed firms.

Ethical Considerations

Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

Funding

Communication for this research is made possible through monetary assistance by Universiti Tun Hussein Onn Malaysia and the UTHM Publisher's Office via Publication Fund E15216.

References

- Agarwala, N., Jana, S., & Sahu, T. N. (2024). ESG disclosures and corporate performance: A non-linear and disaggregated approach. *Journal of Cleaner Production*, 437, 140517. <https://doi.org/10.1016/j.jclepro.2022.140517>
- Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance*, 20(7), 1409–1428. <https://doi.org/10.1108/CG-06-2020-0258>



- Albitar, K., Hussainey, K., Kolade, N., & Gerged, A. M. (2020). ESG disclosure and firm performance before and after IR: The moderating role of governance mechanisms. *International Journal of Accounting & Information Management*, 28(3), 429–444. <https://doi.org/10.1108/IJAIM-09-2019-0108>
- Bilgehan, T. (2021). The nexus between financial failure and stock prices: Panel Pedroni, Panel Kao and Panel ARDL co-integration tests in Turkey REITs. *Финансы: теория и практика*, 25(6), 145–164. <https://doi.org/10.26794/2587-5671-2021-25-6-145-164>
- Brounen, D., & Marcato, G. (2018). Sustainable insights in public real estate performance: ESG scores and effects in REIT markets. *Lawrence Berkeley National Laboratory*. <https://escholarship.org/uc/item/6fh1x6gn>
- Chen, Z., & Xie, G. (2022). ESG disclosure and financial performance: Moderating role of ESG investors. *International Review of Financial Analysis*, 83, 102291. <https://doi.org/10.1016/j.irfa.2022.102291>
- Devine, A., Kok, N., & Wang, C. (2023). Sustainability disclosure and financial performance: The case of private and public real estate. *The Journal of Portfolio Management*, 49(10), 182–202. <https://doi.org/10.3905/jpm.2023.1.429>
- Duque-Grisales, E., & Aguilera-Caracuel, J. (2021). Environmental, social and governance (ESG) scores and financial performance of multinationals: Moderating effects of geographic international diversification and financial slack. *Journal of Business Ethics*, 168(2), 315–334. <https://doi.org/10.1007/s10551-019-04177-w>
- Erol, I., Unal, U., & Coskun, Y. (2023). ESG investing and the financial performance: A panel data analysis of developed REIT markets. *Environmental Science and Pollution Research*, 30(36), 85154–85169. <https://doi.org/10.1007/s11356-023-27791-1>
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, 25(2), 383–417. <https://doi.org/10.2307/2325486>
- Feng, Z., & Wu, Z. (2023). ESG disclosure, REIT debt financing and firm value. *The Journal of Real Estate Finance and Economics*, 67(3), 388–422. <https://doi.org/10.1007/s11146-022-09916-2>
- Feng, Z., Lu-Andrews, R., & Wu, Z. (2022). The impacts of climate risk on commercial real estate: Evidence from REITs. *SSRN*. <https://doi.org/10.2139/ssrn.4284338>
- Feng, Z., Lu-Andrews, R., & Wu, Z. (2024). Commercial real estate in the face of climate risk: Insights from REITs. *Journal of Real Estate Research*, 1–29. <https://doi.org/10.1080/08965803.2024.2352917>
- Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139192675>
- Giannopoulos, G., Fagernes, R. V. K., Elmarzouky, M., & Hossain, K. A. B. M. A. H. (2022). The ESG disclosure and the financial performance of Norwegian listed firms. *Journal of Risk and Financial Management*, 15(6), 237. <https://doi.org/10.3390/jrfm15060237>
- Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., ... & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285–291. <https://doi.org/10.3233/EFI-180221>
- Ilhan, E., Krueger, P., Sautner, Z., & Starks, L. T. (2023). Climate risk disclosure and institutional investors. *The Review of Financial Studies*, 36(7), 2617–2650. [https://doi.org/10.1093/rfs/36\(7\)/2617](https://doi.org/10.1093/rfs/36(7)/2617)
- Jha, M. K., & Rangarajan, K. (2020). Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility*, 5(1), 10. <https://doi.org/10.1186/s41180-020-00039-y>
- Kumar, P., & Firoz, M. (2022). Does accounting-based financial performance value environmental, social and governance (ESG) disclosures? A detailed note on a corporate sustainability perspective. *Australasian Accounting, Business and Finance Journal*, 16(1), 41–72. <https://doi.org/10.14453/aabfj.v16i1.4>
- Matos, P. (2020). *ESG and responsible institutional investing around the world: A critical review*. CFA Institute Research Foundation. <https://doi.org/10.2470/rf.v2020.n1.1>
- Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, 7, 100777. <https://doi.org/10.1016/j.mex.2020.100777>
- Mohammad, W. M., & Wasiuzzaman, S. (2021). Environmental, social and governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, 2, 100015. <https://doi.org/10.1016/j.cesys.2021.100015>
- Mohanty, B., Aashima, Kaushik, M. B., Gehlot, V., & Sharma, S. (2023). Investigating the relationship between corporate sustainability reporting and firm performance: Evidence from emerging economy. *International Journal of Sustainable Development and Planning*, 18(12), 4031–4040. <https://doi.org/10.18280/ijstdp.181234>
- Morri, G., Anconetani, R., & Benfari, L. (2021). Greenness and financial performance of European REITs. *Journal of European Real Estate Research*, 14(1), 40–61. <https://doi.org/10.1108/JERER-03-2020-0021>
- Morri, G., Yang, F., & Colantoni, F. (2024). Green investments, green returns: Exploring the link between ESG factors and financial performance in real estate. *Journal of Property Investment & Finance*, 42(5), 435–452. <https://doi.org/10.1108/JPIF-10-2023-0096>
- Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, 52, 400–407. <https://doi.org/10.1016/j.econmod.2015.09.019>
- Omokhomion, I. (2023). *Real estate investment trusts (REITs) corporate governance and investment decision-making in the United Kingdom, South Africa and Nigeria* (Doctoral dissertation, London South Bank University). London South Bank University. <https://doi.org/10.18744/lbu.941v8>
- Park, S. (2017). Corporate social responsibility, visibility, reputation and financial performance: Empirical analysis on the moderating and mediating variables from Korea. *Social Responsibility Journal*, 13(4), 856–871. <https://doi.org/10.1108/SRJ-01-2017-0012>
- Prabawati, P. I., & Rahmawati, I. P. (2022). The effects of environmental, social, and governance (ESG) scores on firm values in ASEAN member countries. *Jurnal Akuntansi dan Auditing Indonesia*, 26(2), 119–129. <https://doi.org/10.20885/jaai.vol26.iss2.art2>
- Pu, G. (2023). A non-linear assessment of ESG and firm performance relationship: Evidence from China. *Economic Research – Ekonomika Istraživanja*, 36(1), 1–22. <https://doi.org/10.1080/1331677X.2022.2113336>
- Robinson, S., & McIntosh, M. G. (2022). A literature review of environmental, social, and governance (ESG) in commercial real estate. *Journal of Real Estate Literature*, 30(1–2), 54–67. <https://doi.org/10.1080/09277544.2022.2106639>
- Rosley, N. A., Muhammad, K., Ghani, E. K., & Sukmadilaga, C. (2023). Environmental, social, and governance disclosure and firm performance: Evidence from firms listed under the FTSE Bursa Malaysia Top 100 Index. *Edelweiss Applied Science and Technology*, 7(1), 1–18. <https://doi.org/10.33805/2576.8484.2153>

- Shabbir, M. S., Aslam, E., Irshad, A., Bilal, K., Aziz, S., Abbasi, B. A., & Zia, S. (2020). Nexus between corporate social responsibility and financial and non-financial sectors' performance: A non-linear and disaggregated approach. *Environmental Science and Pollution Research*, 27, 39164–39179. <https://doi.org/10.1007/s11356-020-09960-1>
- Tahmid, T., Hoque, M. N., Said, J., Saona, P., & Azad, M. A. K. (2022). Does ESG initiatives yield greater firm value and performance? New evidence from European firms. *Cogent Business & Management*, 9(1), 2144098. <https://doi.org/10.1080/23311975.2022.2144098>
- Wang, X., & Jin, S. (2023). Environmental, social, and governance performance and corporate sustainable development in China. *Journal of Global Business and Trade*, 19(1), 91–107. <https://doi.org/10.2023/jgbt.19.1.91>
- Wellalage, N. H., Kumar, V., Hunjra, A. I., & Al-Faryan, M. A. S. (2022). Environmental performance and firm financing during COVID-19 outbreaks: Evidence from SMEs. *Finance Research Letters*, 47, 102568. <https://doi.org/10.1016/j.frl.2022.102568>
- Yang, K., & Meho, L. I. (2006). Citation analysis: A comparison of Google Scholar, Scopus, and Web of Science. *Proceedings of the American Society for Information Science and Technology*, 43(1), 1–15. <https://doi.org/10.1002/meet.14504301185>
- Zheng, Z., & Lee, C. L. (2025). A meta-analysis of ESG factors in the real estate investment trusts sector: Exploring their impacts on REITs performance. *Engineering, Construction and Architectural Management*. Advance online publication. <https://doi.org/10.1108/ECAM-05-2024-0652>

