ESG and Stock Performance: A Systematic Review of Heterogeneous Effects, Measurement Challenges, and Investment Implications

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ABSTRACT

Environmental, Social, and Governance (ESG) factors have become increasingly influential in investment decision-making and corporate strategy. However, empirical evidence regarding the relationship between ESG performance and stock returns remains mixed and sometimes contradictory. This study synthesizes findings from 234 empirical studies examining ESG–financial performance relationships, focusing on measurement approaches and contextual moderating factors. The findings indicate that ESG integration is generally associated with neutral to moderately positive financial outcomes, primarily through enhanced risk management, reputational advantages, and crisis resilience. However, substantial inconsistencies arise due to methodological differences among ESG rating agencies and contextual factors such as regional institutional environments, sectoral characteristics, and market conditions. Developed markets typically exhibit stronger ESG–financial performance relationships compared with emerging markets, while sector-specific ESG materiality determines which ESG pillars influence financial outcomes. Overall, the evidence suggests that ESG effects on stock performance are highly context-dependent rather than universally positive. The study highlights the importance of standardized ESG measurement frameworks and context-sensitive investment strategies for improving the reliability and practical relevance of ESG research.

Keywords: ESG performance, stock returns, sustainable investment, ESG measurement, financial performance

INTRODUCTION

The Rise of ESG in Financial Markets

Environmental, Social, and Governance (ESG) considerations have transformed from niche ethical concerns to mainstream investment criteria over the past two decades. Global ESG assets under management have surpassed trillions of dollars, with exponential growth in ESG-related funds across developed and emerging markets (Fidanza, 2025; Gupta, 2025). This dramatic shift reflects multiple converging forces such as increasing regulatory pressures worldwide, growing investor demand for transparency and sustainability, and mounting evidence that ESG factors contribute to long-term value creation and risk mitigation (Zhytar, 2025; Saci & Khalifa, 2025).

Despite this widespread adoption, empirical evidence on the ESG–financial performance relationship remains mixed and sometimes contradictory. Several factors contribute to these inconsistencies (Chen et al., 2023). First, ESG measurement methodologies vary widely across rating providers, leading to significant discrepancies in ESG scores assigned to the same firms. Second, ESG performance may interact with regional institutional environments, industry characteristics, and market conditions, producing heterogeneous outcomes across different contexts.

The integration of ESG factors into investment decisions is now widely theorized to affect financial performance through several mechanisms such as improved risk management, enhanced corporate reputation, stronger stakeholder relationships, regulatory compliance, and operational efficiency (Chen et al., 2023; Gong, n.d.). During crisis periods notably the COVID-19 pandemic firms with robust ESG profiles have demonstrated greater resilience, lower volatility, and better access to capital (Ma, 2024; Meier et al., 2024; Deb, 2025).

This study synthesizes existing literature to examine the empirical relationship between ESG performance and stock returns while identifying key contextual moderators influencing this relationship

LITERATURE REVIEW

A large body of literature has examined whether ESG performance contributes to firm financial outcomes. Many studies find that ESG integration is associated with neutral to moderately positive financial performance, particularly when measured using risk-adjusted metrics such as Sharpe ratios or long-term returns. Meta-analytic research suggests that ESG effects on stock performance are generally modest but positive.

However, empirical findings remain inconsistent. One major explanation for these discrepancies is variation in ESG measurement methodologies. ESG ratings are typically provided by third-party agencies such as MSCI, Bloomberg, Refinitiv, and Sustainalytics, each using distinct scoring models and weighting systems. As a result, companies often receive significantly different ESG scores depending on the rating provider used, which can lead to divergent research conclusions (Fidanza, 2025; Gupta, 2025; Juthi et al., 2024).

The Persistence of Contradictory Evidence

Despite the widespread adoption of ESG in investment practices and the theoretical support for its potential benefits, the empirical relationship between ESG performance and stock returns remains surprisingly contested. While numerous studies report positive correlations between high ESG scores and improved financial outcomes, others find mixed, neutral, or even negative effects (Siddiqui et al., 2024; Friede et al., 2015).

Measurement inconsistencies: Different ESG rating agencies (MSCI, Bloomberg, Refinitiv, Sustainalytics) produce divergent scores for the same firms, leading to conflicting empirical results depending on which data source researchers employ (Fidanza, 2025; Tabur & Bildik, n.d.; Jin et al., 2024).

Regional heterogeneity: Developed markets typically show stronger positive ESG-financial links than emerging economies, where institutional contexts, regulatory maturity, and data quality vary substantially (Deb, 2025; Siddiqui et al., 2024; Azizah & Haron, 2025).

Sectoral specificity: The materiality of ESG factors differs dramatically across industries environmental concerns dominate in energy and manufacturing, governance matters more in financial services, and social factors prove critical in technology and consumer sectors (Tutar et al., 2025; Hogenmuller et al., n.d.; Cristea et al., 2025).

Pillar-level divergence: The environmental, social, and governance components often exhibit distinct and sometimes opposing relationships with financial performance, yet many studies aggregate them into composite scores that obscure these dynamics (Siddiqui et al., 2024; Gül & Altuntaş, 2024; Gonçalves & Barros, 2023).

Temporal variation: ESG effects appear more pronounced during crises than in stable periods, suggesting that ESG functions partly as downside protection rather than consistent alpha generator (Ma, 2024; Berkman & Tirodkar, n.d.; Atz et al., 2021).

The Need for Synthesis

These persistent contradictions create significant challenges for investors constructing ESG portfolios, for

corporate managers allocating resources to sustainability initiatives, and for policymakers designing effective ESG regulations (Mangla, 2024; Irianto et al., 2025). Without a clear understanding of when, where, and how ESG affects stock performance, stakeholders cannot make informed decisions about ESG integration.

Previous reviews have addressed aspects of these questions (Friede et al., 2015; Atz et al., 2021; Narula et al., 2024), but the literature has expanded rapidly since 2020, incorporating new methodologies (machine learning, causal inference), new contexts (COVID-19 crisis, emerging markets), and new concerns (greenwashing, rating divergence). What is now needed is a comprehensive synthesis that is, a systematic integration and analysis of the accumulated evidence that moves beyond summarizing individual findings to explain *why* results differ across studies and to identify the conditions under which ESG affects stock performance. Such a synthesis is essential for resolving apparent contradictions and offering actionable guidance.

Research Questions (RQ) and Contribution

This systematic review addresses two interconnected research questions:

RQ1: What is the empirical evidence on the relationship between ESG performance and stock returns, and how does this vary by measurement approach?

RQ2 How do regional institutional contexts, sectoral characteristics, and market conditions influence the relationship between ESG and financial performance?

The review makes three primary contributions to sustainable finance literature. First, it provides the most comprehensive synthesis to date of ESG–stock performance research, incorporating studies published through 2025 and systematically analyzing sources of heterogeneity in the relationship between ESG and stock returns. Second, it develops an integrated theoretical framework that reconciles apparently contradictory findings by specifying the conditions under which ESG affects stock performance. Third, it offers a prioritized research agenda and practical implications for investors navigating the complex ESG landscape.

THEORETICAL FRAMEWORK

This review is guided by an integrated theoretical framework drawing on stakeholder theory, institutional theory, and signaling theory. Stakeholder theory (Freeman, 1984) suggests that firms aligning their practices with broader stakeholder interests including employees, customers, communities, and environmental advocates will experience enhanced long-term performance through improved relationships, reduced conflict, and stronger legitimacy. ESG integration represents a concrete manifestation of stakeholder orientation.

Institutional theory (DiMaggio & Powell, 1983; Scott, 2014) explains why ESG effects vary across regions: different institutional environments regulatory frameworks, normative expectations, cultural-cognitive structures shape both the meaning of ESG practices and their consequences for firms. In developed markets with strong institutions, ESG signals genuine commitment; in weaker institutional contexts, ESG may represent symbolic compliance or face implementation challenges.

Signaling theory (Spence, 1973) illuminates the role of ESG disclosure and ratings: firms use ESG reporting to signal their quality and sustainability to investors, reducing information asymmetry. However, signaling effectiveness depends on disclosure credibility, which varies with regulatory enforcement and audit mechanisms.

Together, these theories suggest that ESG effects on stock performance should be understood as contingent on: (a) the materiality of ESG factors to firm operations, (b) the institutional context in which firms operate, (c) the credibility of ESG signals, and (d) the time horizon over which effects are measured.

RESEARCH METHODOLOGY

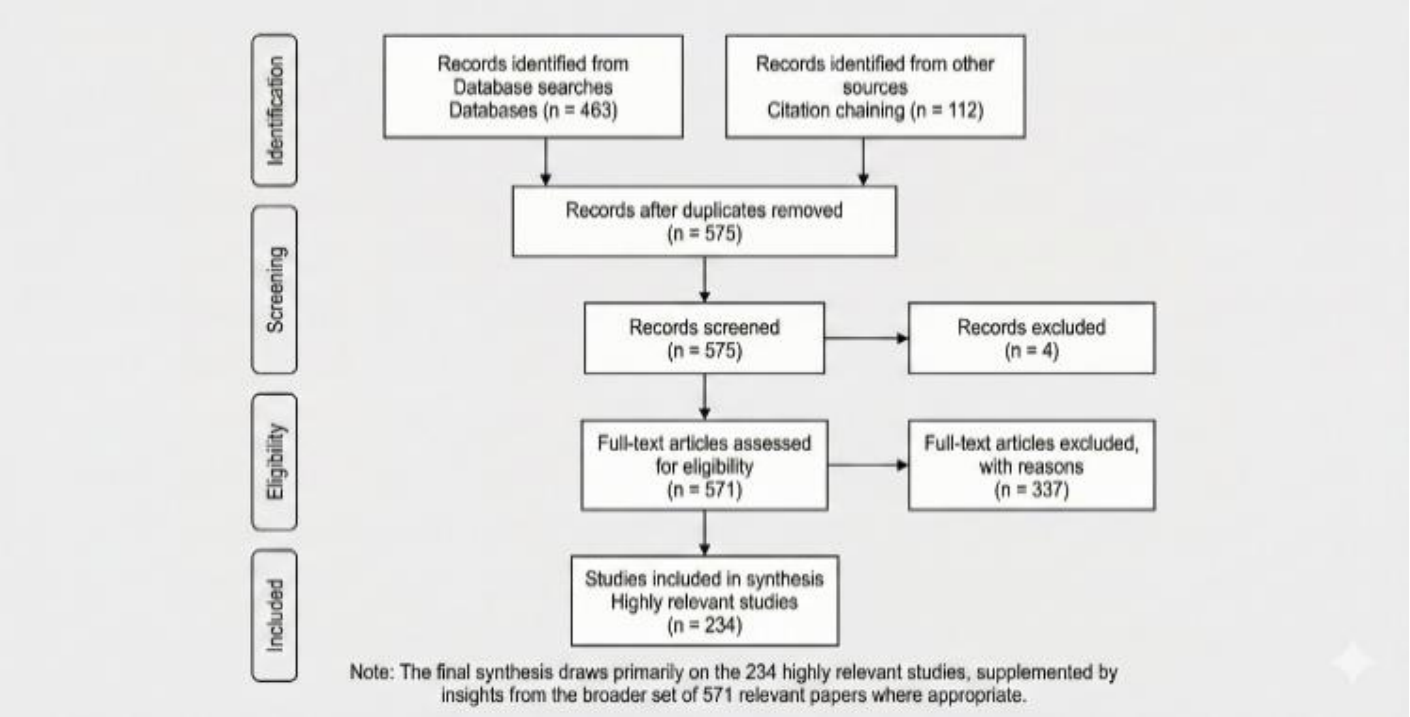
This paper presents a systematic literature review of empirical research on ESG performance and stock returns, following established systematic review guidelines to ensure transparency and methodological rigor.

Relevant studies were identified through searches of major academic databases, including Scopus, Web of Science, SSRN, Google Scholar, and ProQuest. The search covered publications from 2000 to 2025 using keywords related to ESG performance, stock returns, financial performance, and sustainable investment. Studies were included if they provided empirical evidence on ESG–financial performance relationships and focused on equity market outcomes. After screening and relevance assessment, a total of 234 highly relevant studies were selected for analysis.

Screening and Selection Process

Table I presents the PRISMA flow diagram summarizing the election process.

TABLE I: PRISMA flow diagram of study selection process for systematic review of ESG-stock performance literature.



Initial database searches yielded 463 candidate papers from transformed queries. Backward and forward citation chaining identified an additional 112 papers, resulting in 575 total candidate papers. After relevance screening, 571 papers were deemed relevant to the research query, with 234 classified as highly relevant based on relevance scoring criteria. The final synthesis draws primarily on the 234 highly relevant studies, supplemented by insights from the broader set where appropriate.

The quality of the included studies was assessed using adapted criteria from the Mixed Methods Appraisal Tool (MMAQ; Hong et al., 2022). Each study was evaluated based on methodological rigor, including the appropriateness of research design, sample size, and analytical techniques, as well as how effectively it addressed endogeneity and causality concerns. Additional assessment criteria included transparency in ESG measurement and data sources, consideration of contextual factors such as region, sector, and period, and overall quality and replicability of reporting. Based on these criteria, studies were categorized as high, moderate, or low quality, with low-quality studies excluded from the primary synthesis but retained for sensitivity analysis.

A standardized data extraction form was used to collect key information from each study, including bibliographic details, research questions and hypotheses, geographic scope and sample characteristics, ESG measurement approaches, financial performance metrics, methodological techniques, main findings and effect sizes, reported limitations, and funding sources or potential conflicts of interest.

The synthesis of findings followed the six-phase thematic analysis approach proposed by Braun and Clarke (2006), which involved familiarization with the studies, initial coding of findings, development of themes through pattern identification, theme review for coherence, definition and naming of themes, and final report production. To ensure reliability, themes were validated through intercoder reliability checks, where two researchers independently coded a random 20% sample of the studies, achieving an agreement rate exceeding 85%.

DISCUSSION ON RESULTS AND FINDINGS

Literature generally suggests a positive or neutral relationship between ESG performance and stock returns, although the magnitude of the relationship tends to be modest. ESG integration often improves firm performance indirectly by enhancing risk management, operational efficiency, and corporate reputation. However, measurement differences across ESG rating providers significantly influence empirical results; studies using different ESG datasets frequently reach contradictory conclusions because rating agencies employ varying methodologies, scoring scales, and weighting systems.

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Descriptive Overview of Literature

This classifies the analysis of the literature review according to temporal distribution and geographic distribution. The literature demonstrates clear temporal phases as follows:

2010-2015 (Foundational phase): Early studies explored basic ESG-financial performance links, often producing mixed evidence. Research focused on whether ESG integration added value or merely reflected non-financial preferences.

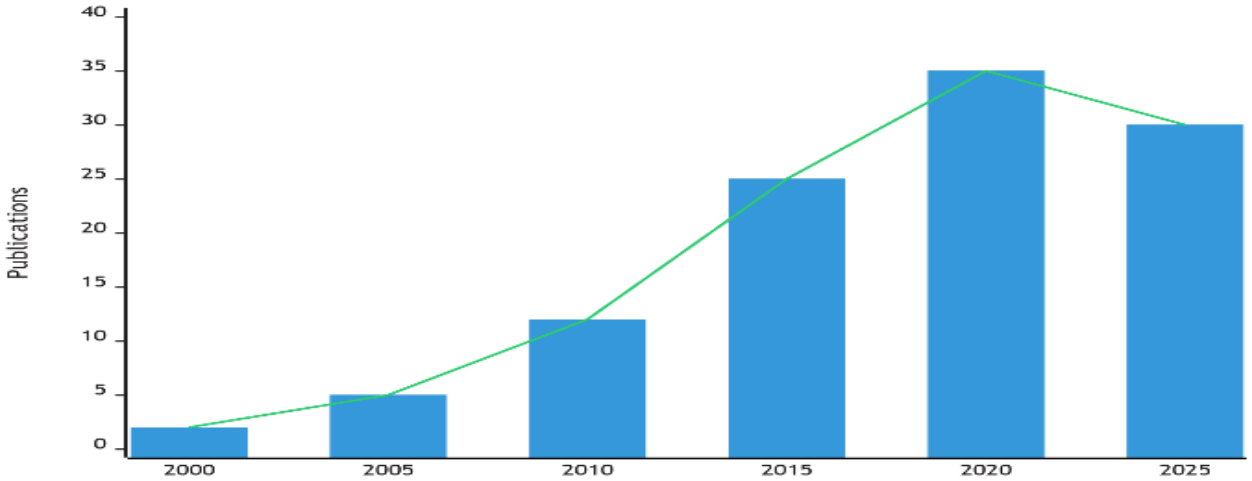
2016-2019 (Integration phase): Attention shifted to incorporating ESG criteria into portfolio construction and asset pricing models. Studies examined whether ESG screening affected risk-adjusted returns, introducing concepts like ESG-efficient frontiers and smart beta strategies.

2020-2023 (Crisis and analytics phase): The COVID-19 pandemic generated substantial research on ESG's role during crises. Methodological advances incorporated machine learning, sentiment analysis, and nonlinear modelling. Disclosure quality and rating inconsistencies gained prominence.

2024-2025 (Standardization phase): Recent literature emphasizes ESG reporting standardization, greenwashing concerns, and technological integration. Regional and sectoral disparities receive increased attention.

Overall, the figure shows accelerating research output after 2015, with methodological shifts from foundational work (2010-2015) to portfolio integration studies (2016-2019), crisis analysis (2020-2023), and recent focus on standardization and technology (2024-2025). Table II illustrates the evolution of ESG-stock performance research from 2000 to 2025.

TABLE II: Temporal Evolution of ESG-Stock Performance Research (2000–2025)



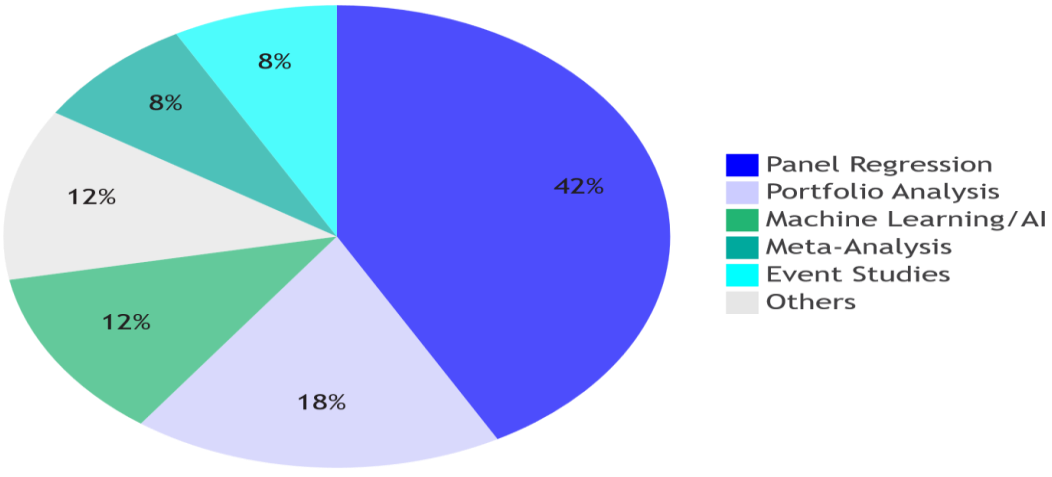
Methodological Approaches

The methodological approaches used in ESG–stock performance research have evolved significantly over time. Earlier studies primarily relied on simple panel regression models, while more recent research employs a range of advanced analytical techniques. These include advanced econometric methods such as two-stage least squares (2SLS) to address endogeneity issues, quantile regression to capture nonlinear relationships, and difference-in-differences models to evaluate policy impacts. In addition, machine learning techniques, including random forests, gradient boosting (XGBoost), and neural networks, are increasingly used for pattern detection and predictive analysis (Juthi et al., 2024; Dash et al., 2024; Jagyasi & Raut, 2023).

Portfolio optimization approaches have also been applied, such as mean-variance optimization with ESG constraints, Black-Litterman models, and factor models (Serban et al., 2025; Cao & Wirjanto, 2023). Furthermore, time-series methods, including wavelet analysis, connectedness measures, and regime-switching models, have been adopted to analyze dynamic relationships in ESG and financial performance (Esparcia & Gubareva, 2024). Table III presents the distribution of methodological approaches across included studies.

Table III: Methodological approaches employed in 234 highly relevant studies. Panel regression (including fixed effects, random effects, and GMM) dominates the literature (42%), followed by portfolio analysis (18%), machine learning/AI (12%), meta-analysis (8%), and event studies (8%). Emerging methods include natural language processing of ESG disclosures and sentiment analysis.

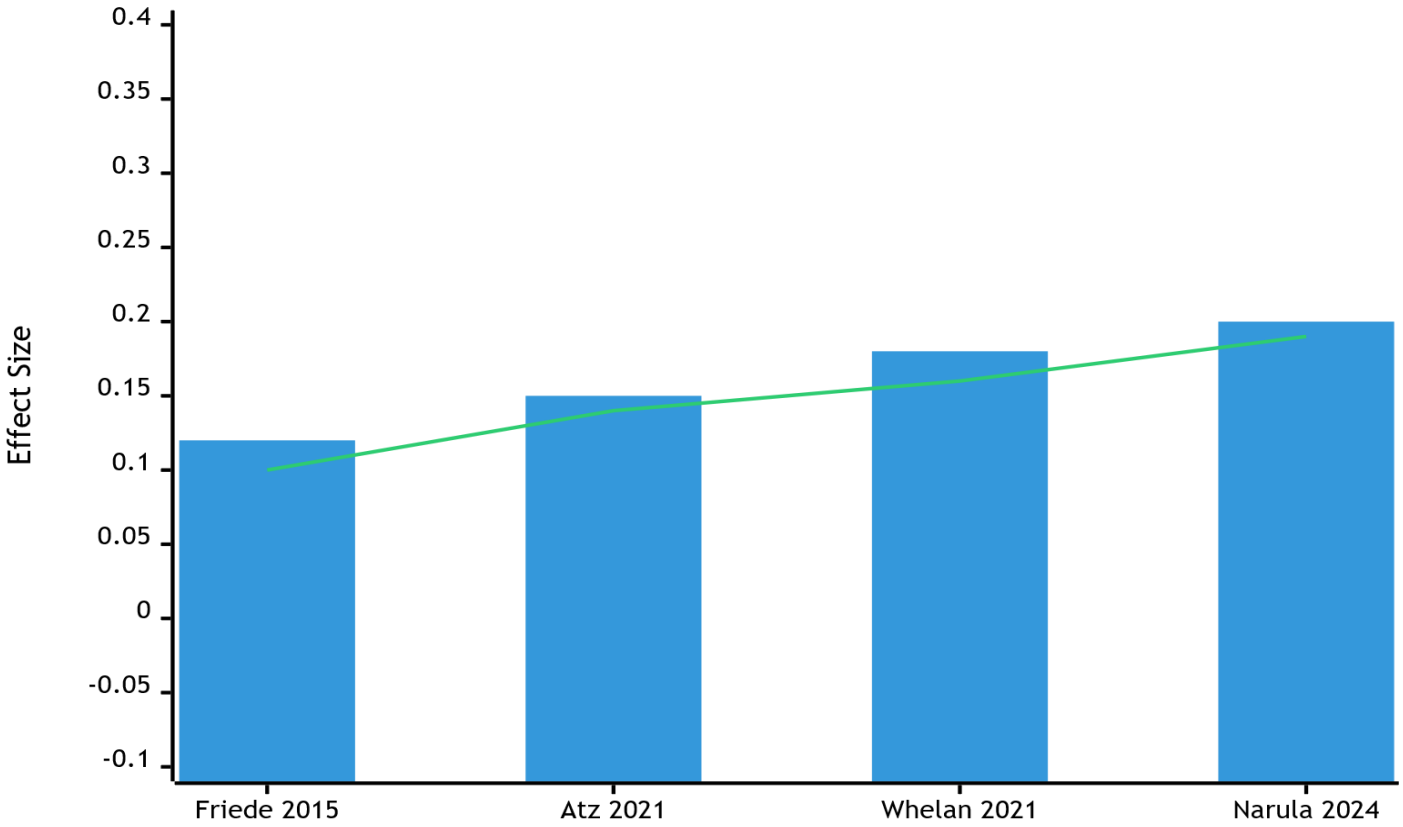
TABLE III: Methodological Approaches in ESG-Stock Performance Research



ESG and Stock Performance: Central Tendencies and Heterogeneity

Approximately 50 studies (21% of the highly relevant sample) find a positive or neutral relationship between ESG performance and financial metrics such as stock returns, profitability, and risk-adjusted returns (Fidanza, 2025; Deb, 2025; Morina & Dinaj, 2024). Table IV synthesizes findings across major meta-analyses. It displays effect sizes (correlation coefficients or standardized mean differences) from major meta-analyses published 2015-2025. Most estimates cluster in the 0.10-0.20 range, indicating modest positive associations. Confidence intervals narrow over time as sample sizes increase. However, these central tendencies mask substantial heterogeneity. The relationship is rarely uniformly positive or negative; rather, it varies systematically with context.

TABLE IV: Meta-Analytic Findings on ESG-Stock Return Relationships



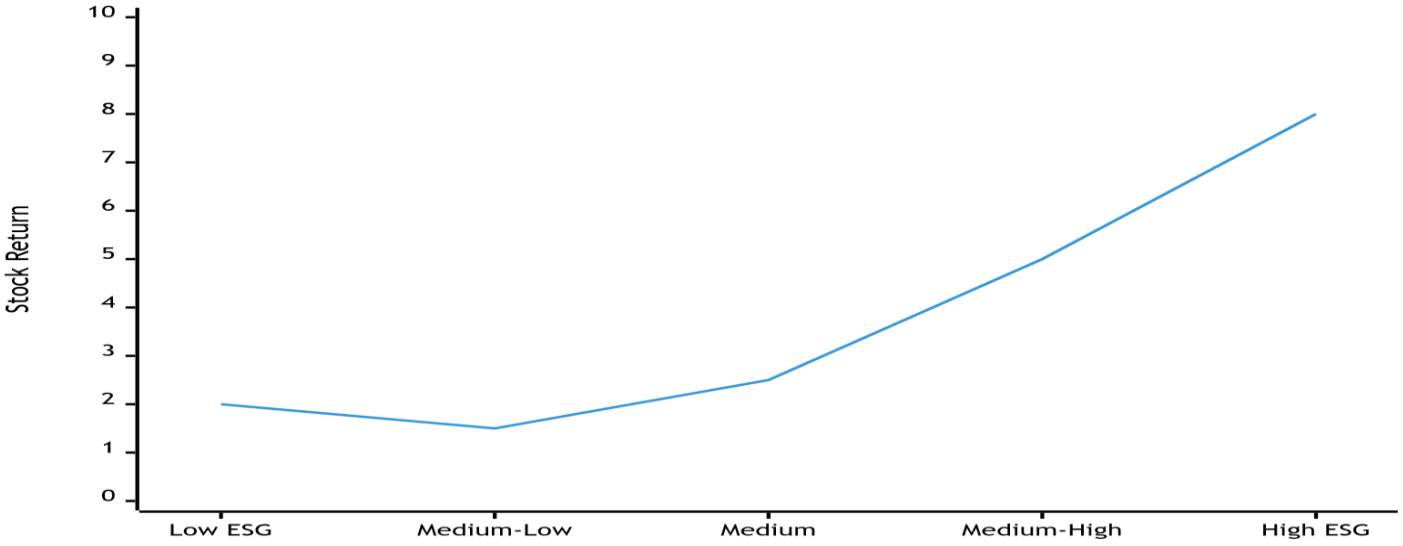
Non-Linear Relationships

Research also identifies non-linear relationships between ESG performance and financial outcomes. Firms at low ESG levels may experience limited financial benefits from initial ESG improvements, while firms achieving high ESG performance tend to generate stronger financial outcomes through improved stakeholder relationships and reduced regulatory risks.

Several studies document non-linear or U-shaped relationships between ESG scores and financial outcomes (Siddiqui et al., 2024; Wang & Sonenshine, 2025). Hypothetical illustration of non-linear ESG-stock return relationships. At low ESG levels, improvements yield marginal returns; moderate ESG levels may involve transition costs that temporarily depress returns; high ESG levels produce positive returns through enhanced stakeholder relationships and risk mitigation. The exact shape varies by industry, region, and time horizon.

The non-linearity finding has important implications which suggest that ESG improvements at very low levels may yield limited immediate financial benefits, the middle range may involve costly transitions that temporarily depress returns, only sustained, high-level ESG performance generates consistent positive returns and studies assuming linear relationships may mis-specify the true effect. Table V illustrates this pattern.

TABLE V: Non-Linear ESG-Stock Return Relationships



Contextual Moderators of ESG–Financial Performance

The ESG–stock performance relationship varies significantly across regions, sectors, and market conditions.

Regional Differences

Developed markets, particularly in North America and Europe, generally demonstrate stronger positive ESG–financial performance relationships due to stronger regulatory frameworks, higher disclosure standards, and greater investor awareness of sustainability issues. In contrast, emerging markets often show mixed or weaker ESG effects due to lower data quality, weaker regulatory enforcement, and limited ESG disclosure practices.

The stronger positive associations between ESG performance and financial outcomes in developed markets can be attributed to several structural advantages. These include mature institutional environments that support effective ESG implementation and enforcement, higher-quality ESG data resulting from established reporting requirements, greater investor awareness and demand for sustainability-related information, and stronger governance infrastructures that enable ESG policies to translate into measurable outcomes.

Additionally, the longer history of ESG adoption in developed economies allows firms to absorb transition costs over time and realize long-term benefits. In contrast, emerging markets face several challenges that may limit the effectiveness of ESG initiatives, including gaps in data quality, fragmented regulatory frameworks, varying levels of investor awareness, and institutional environments that may not fully support the implementation of ESG practices (Bhatia, 2024; Azizah & Haron, 2025; Finogenova & Larkova, 2024). Table VI summarizes regional differences in ESG-financial performance relationships.

TABLE VI: Regional Patterns in ESG-Stock Performance Relationships

Region	Typical Finding	Key Moderators	Representative Studies
United States	Positive to neutral	Strong institutions; mature ESG market; large sample sizes	Dreyer et al. (2023); Serban et al. (2025); Habib & Mourad (2023)
Europe	Generally positive	Strong regulatory frameworks; high ESG awareness; mandatory disclosure	Gonçalves & Barros (2023); Asteriou et al. (2023); Cristea et al. (2025)

Japan	Positive emerging	Government ESG initiatives; institutional investor pressure	Yoshida et al. (2024)
China	Mixed; context-dependent	State ownership; regulatory environment; rapid evolution	Wang & Zhang (2024); Feng et al. (2022)
India	Mixed; governance dominates	Institutional reforms needed; data quality challenges	Parikh et al. (2023); SINGH & Singh (2024); Shrimal et al. (2024)
Southeast Asia	Positive but variable	Emerging adoption; regulatory gaps	Azizah & Haron (2025); Yoshida et al. (2024)
Latin America	Emerging evidence	Institutional variation; growing attention	Useche et al. (2024); González et al. (2023)
Middle East	Nascent; sector-specific	Oil/gas dominance; Shariah considerations	Hussain et al. (2024)

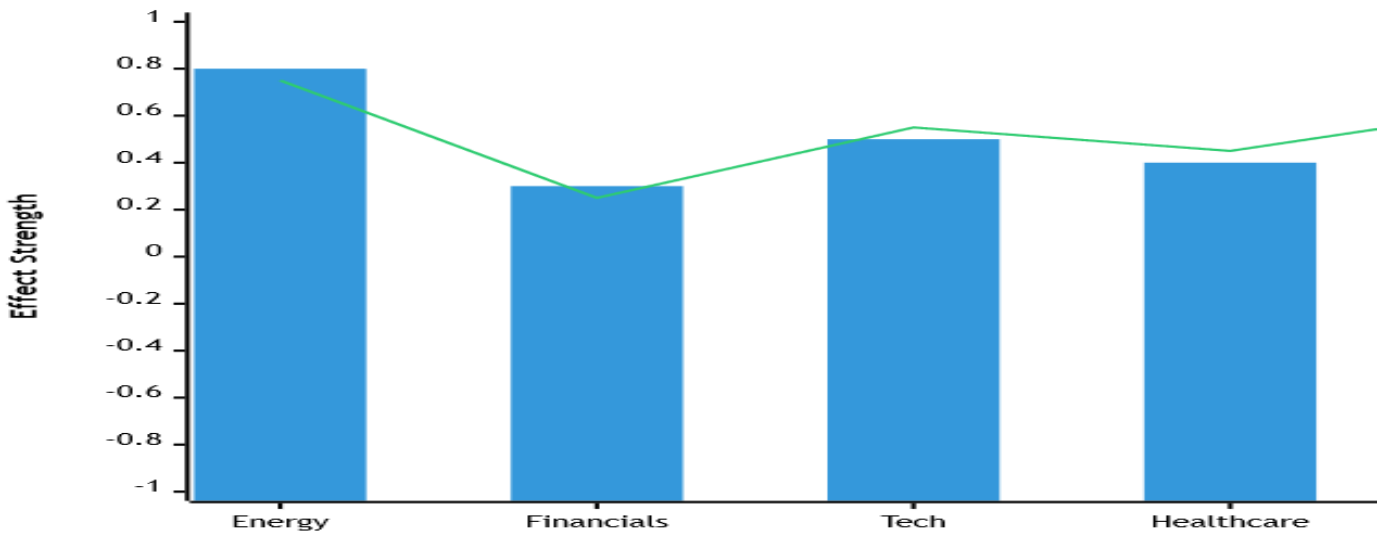
Sectoral Variation in ESG Effects

The relationship between ESG performance and financial outcomes varies significantly across sectors, reflecting the differing materiality of specific ESG factors. Environmental factors are most critical in energy, utilities, and manufacturing, with carbon emissions and resource use strongly influencing financial performance in energy and utilities (Hyusein & Çek, 2024; Horobet et al., 2025), while manufacturing relies on a combination of environmental (pollution, waste) and social (labor practices, safety) considerations, moderated by governance structures (Onomakpo, 2025; Iazzolino et al., 2023).

In financial services, governance is the dominant factor, though environmental and social dimensions are increasingly relevant through lending and investment activities (Loukili & Benli, 2023; Lupu & Criste, 2024; Gangwani & Kashiramka, 2024). Technology firms prioritize social factors such as data privacy and human capital, with governance of AI and emerging technologies gaining importance (Surenthran et al., 2024).

In renewable energy, environmental considerations remain fundamental, while governance structures affect access to capital (Onomakpo, 2025). These patterns highlight the need for materiality-based ESG integration, as one-size-fits-all strategies risk overlooking sector-specific dynamics. Table VII illustrates how ESG effects vary across major economic sectors.

TABLE VII: Sectoral Variation in ESG-Stock Performance Relationships



Market Conditions and Crisis Effects

Market conditions also influence ESG outcomes. During periods of economic crisis, firms with strong ESG performance tend to demonstrate greater resilience, including lower stock volatility and faster recovery.

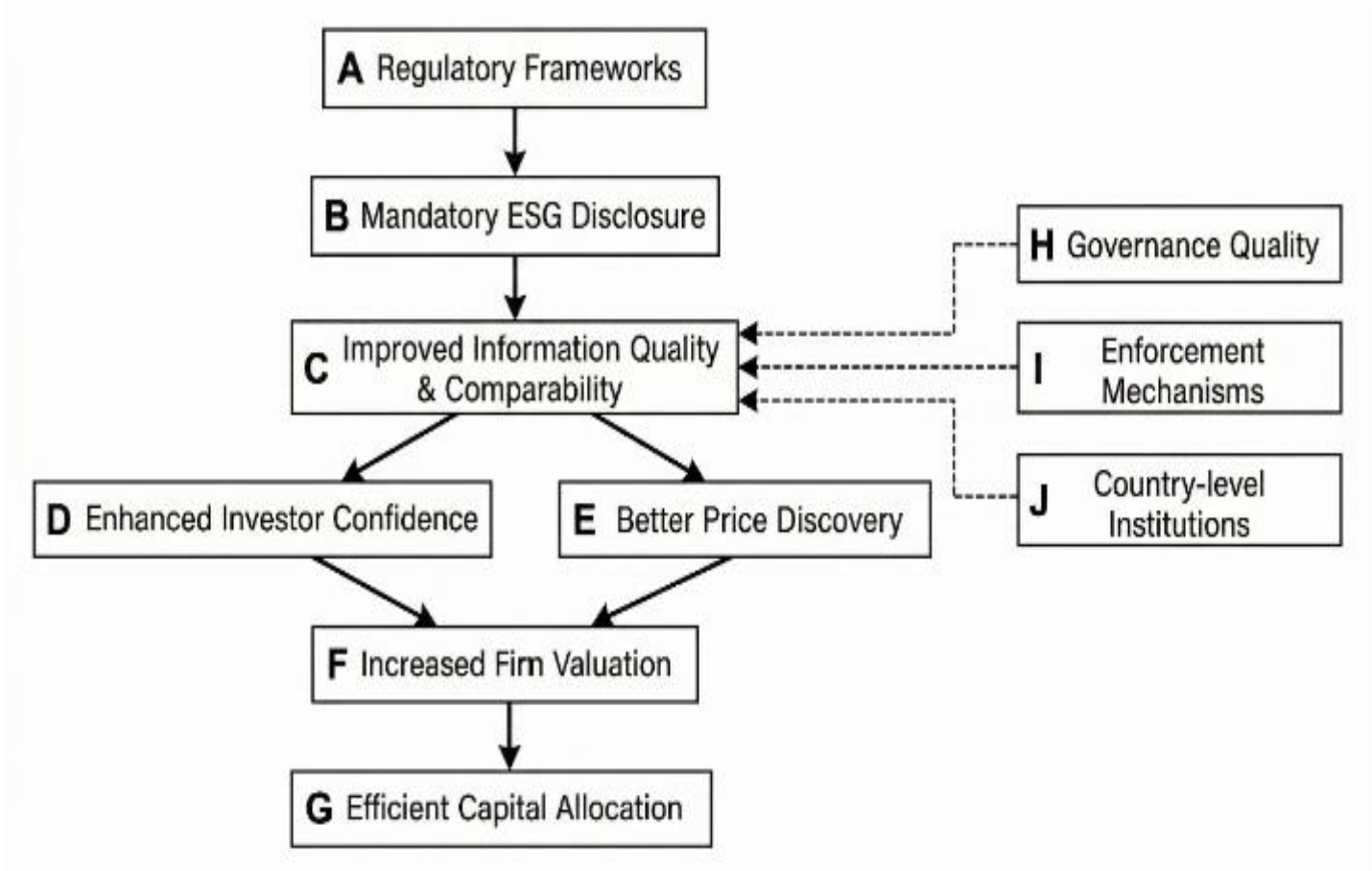
The COVID-19 pandemic provided a natural experiment for examining ESG's role during systemic crises. Forty-five studies in our sample examine crisis-period dynamics, with remarkably consistent findings: firms with strong ESG profiles demonstrated greater stock price resilience, lower volatility, and better operating performance during the pandemic (Ma, 2024; Meier et al., 2024; Habib & Mourad, 2023; Berkman & Tirodkar, n.d.).

Regulatory Effects on ESG–Market Relationships

A growing body of research highlights the impact of regulatory frameworks on ESG-financial performance relationships, showing that mandatory ESG disclosure requirements enhance several key outcomes. Such regulations improve price discovery efficiency, enabling stock prices to more accurately reflect ESG information (Zhang et al., 2023), and bolster investor confidence by reducing uncertainty and information asymmetry through standardized reporting (Pratiwi & Edeh, 2024). Mandatory disclosure also positively influences firm valuation, particularly for companies with strong ESG performance (Lohia & Maji, 2025), and guides capital allocation by directing investments toward better-performing firms (Fidanza, 2025).

Conceptual framework linking ESG regulation to market outcomes. Mandatory disclosure requirements improve information quality and comparability, which enhances investor confidence and price discovery. This, in turn, affects firm valuation and capital allocation as well as strong governance environments. Table VIII illustrates the causal chain from regulation to market outcomes.

TABLE VIII: Regulatory Effects on ESG-Market Relationships



CONCLUSION

This study synthesizes empirical literature examining the relationship between ESG performance and stock returns. The findings indicate that ESG integration is generally associated with neutral to moderately positive financial outcomes, primarily through improved risk management, stakeholder relationships, and crisis resilience.

However, the ESG–financial performance relationship is highly context-dependent. Measurement inconsistencies across ESG rating agencies remain a major source of conflicting findings in the literature. Additionally, regional institutional environments, sector-specific sustainability risks, and market conditions significantly shape ESG outcomes.

Developed markets tend to exhibit stronger ESG–stock performance relationships due to mature regulatory frameworks and higher disclosure standards. Sectoral differences further determine which ESG pillars are most financially material. Finally, ESG benefits are often most visible during periods of economic instability, when strong stakeholder relationships and risk management practices enhance firm resilience.

Future research should prioritize standardization of ESG measurement frameworks, deeper analysis of pillar-specific effects, and greater attention to emerging market contexts. Such efforts will improve the reliability of ESG research and support more effective integration of sustainability considerations into investment decision-making.

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