

The Impact of ESG Performance on Corporate Financial Performance: Evidence from Global Listed Companies

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Abstract

Corporate sustainability has emerged as a central concern for investors, managers, and policymakers seeking to understand the drivers of long-term financial value creation. This study empirically examines the relationship between Environmental, Social, and Governance (ESG) performance and corporate financial performance (CFP) among globally listed companies. Drawing on stakeholder theory (Freeman, 1984) and the resource-based view (Barney, 1991), the study employs two complementary datasets — a cross-industry sample of 731 publicly listed firms and a focused sample of 30 Dow Jones Industrial Average constituents — to test three theoretically derived hypotheses using Ordinary Least Squares (OLS) regression analysis. Financial performance is operationalized through price-to-earnings (P/E), price-to-book (P/B), and debt-to-equity (D/E) ratios. Results reveal a significant positive association between aggregate ESG performance and market-based valuation indicators, with the environmental pillar emerging as the strongest individual predictor of both P/E ($\beta = 1.312$, $p < 0.001$) and P/B ratios ($\beta = 0.144$, $p < 0.01$). Robustness checks using the Dow 30 dataset confirm these findings ($R^2 = 0.287$, $p = 0.002$). No significant relationship is detected between ESG scores and leverage. These findings contribute to the



growing empirical consensus that sustainability investment is broadly compatible with – and in many cases supportive of – superior financial performance, with important implications for ESG-oriented investment strategy and corporate governance practice.

1. Introduction

The connection between a company's sustainability and profitability has been a subject of academic study for more than 50 years. Starting from Carroll's (1979) conceptual model of corporate social performance, and formalizing the relationship between social and financial outcomes, Preston and O'Bannon (1997), the academic discussion has moved away from merely asking the question, "Does it pay?" toward a much more sophisticated question: How, when, and under what conditions do sustainability investments lead to financial value? Today this discussion is happening as part of the Environmental, Social, and Governance (ESG) criteria, which is the triple bottom line with which investors, regulators, and corporate managers evaluate non-financial performance.

ESG as a formal concept came to the forefront of the financial mainstream in 2004 with the release of the United Nations Global Compact's groundbreaking Who Cares Wins

report, which made an explicit argument for incorporating environmental, social and governance factors into analysis of the capital markets (United Nations Global Compact, 2004). The environmental dimension reflects a company's relationship with the environment (e.g., carbon emissions, energy consumption, biodiversity affect, waste production). Social includes labor, employee health and safety, diversity and inclusion, supply chain and community relations. The governance dimension focuses on the mechanisms for directing and controlling firms: independence of the boards, compensation of executives, and rights of shareholders as well as transparency in financial and non-financial disclosure. These three pillars combine to form – in foundational terms – what Freeman (1984) called "the responsibilities of the firm" towards the wider stakeholder community.

There has been a very quick and widespread institutionalisation of ESG. As of 2020, sustainable investments worldwide will have grown to \$35 trillion, more than 36%



of all assets under management in major markets (Global Sustainable Investment Alliance 2021). Large institutional investors, sovereign wealth funds, and pension funds have increasingly incorporated ESG into their fiduciary frameworks, not only for ethical reasons but because of an accumulating body of evidence that suggests sustainability performance could be a proxy for management quality, and long-term value creation (Eccles et al., 2014; Whelan et al., 2021; Kashif et al., 2024). This change is a significant change in the way that the financial markets value corporate behavior.

However, there is still a relatively diverse academic literature on the ESG-financial performance relationship. The largest synthesis, to date, was a meta-analysis of more than 2,200 empirical studies performed by Friede et al. (2015) which revealed an average of around 90% of studies showed a non-negative correlation between ESG and financial performance, with the majority of studies showing a positive correlation. Likewise, after examining 132 studies published in high quality journals, Alshehhi et al. (2018) concluded that 78% of the studies indicated positive correlation between sustainability practices and the financial performance of the companies. But a non-trivial minority of studies find neutral or even negative results and Barnett and Salomon (2006) have proven

that the relationship can be curvilinear, meaning that the financial performance of sustainability-investors may initially decrease with more social screening and then improve as the amount of social screening increases, indicating that the relationship is more complex than suggested by the linear model.

One key methodological challenge the literature faces is the lack of agreement among the providers of ESG rating, thereby creating high uncertainty in measurement. Berg et al. (2022) examined ratings provided by six of the largest ESG rating providers and found that, on average, the ratings assigned by different providers of these ratings correlated at only 0.54, which is much lower than credit ratings. This difference (which the authors split into scope (38%), measurement (56%) and weighting (6%)) makes research and investment decisions even more difficult because the results of various research using one rating system may not be repeatable using another. To overcome this issue, this paper relies on datasets which not only reflect one single perspective on ESG ratings, but rather a combination of rater perspectives, which decreases the reliance on one specific ESG rating methodology.

This paper contributes to the literature in three particular ways. It first explores the ESG-financial



performance link with an extensive, cross-industry, and globally representative sample of publicly listed companies, consisting of more than 700 firms from various industry and geographic segments. Second, it breaks down the three components of ESG – environmental (E), social (S), and governance (G), to see how they each predict financial performance, and provides a more detailed understanding of which sustainability elements are more likely to impact financial results. Third, it uses two complementary datasets (the ESG Ratings and Stock Data for Dow 30 Companies dataset and the Public Company ESG Ratings Dataset) to offer both large sample evidence and a focused analysis of blue-chip companies. The theory used in this study to formulate and test the hypotheses is based on the empirical stakeholder theory of Freeman (1984) which was extended by Khan et al. (2016) and Eccles et al. (2014).

The rest of this paper goes like this. The theoretical and empirical literature related to the problem is reviewed in section 2. The methodology of the research, data and variables are described in section 3. In Section 4 the empirical results are presented together with a discussion on the result. Conclusions, limitations and suggestions for further study are provided in Section 5.

2. Literature Review

2.1 Theoretical Foundations

ESG research has a number of theoretical roots that overlap. Stakeholder theory has been the most influential, as it was the stakeholder concept that was first articulated and applied in Strategic Management: A Stakeholder Approach (Freeman, 1984). Freeman responded that this is not a company just for the benefit of the shareholders, but rather a collection of relationships across a variety of stakeholder groups—employees, customers, suppliers, communities, regulators, and the natural environment—and it is the responsibility of the company to manage each of these relationships at the same time. The direct implication of this theoretical shift on the ESG-financial performance debate is that if the management of relations with stakeholders reduces conflict, creates reputational capital and improves the efficiency of the company, then the companies that invest in environmental and social performance can derive systematic financial benefits from these investments (Waddock & Graves, 1997; Kashif et al., 2022).

Related is legitimacy theory, which suggests that in the society in which an organization operates, they need to become attuned to the



society's norms and expectations to obtain a license to operate (Suchman, 1995). Companies recognized as good corporate citizens become socially legitimate, thus avoiding the financial risk of regulatory action, consumer boycotts and damage to their reputations. This suggests that there is a complementary explanation for the positive ESG-financial performance relationship: ESG investment could serve as a mechanism of 'reputational insurance' that can mitigate the likelihood and impact of negative social and regulatory outcomes.

A third lens is provided by the resource based view of the firm (Barney, 1991). In this view, a company's ESG attributes, be it its advanced environmental management system, inclusive human capital practices or strong governance, could be resources that are scarce, valuable, imperfectly imitable, and non-substitutable and can lead to a sustained competitive advantage. The monetary benefit of these capabilities is not only in avoiding risks but in innovation, increased productivity and customer and employee satisfaction. The results are also similar to those of Eccles et al. (2014), who describe how companies with a sustainability culture have particular organizational processes—such as stakeholder engagement mechanisms, longer-term executive

incentive structures and increased non-financial disclosure—linked to long-term financial performance.

Agency theory also plays a part in the debate but mainly as a source of counter arguments. The concept of corporate social spending over and above the legal minimum comes from a classical perspective on agency, namely when corporate spending goes over and above what is required by law, then the managers of that company are involved in an agency problem" (Friedman, 1970) which is the direction of corporate resources to a non-profit maximizing activity because of the personal reputational or ethical concerns of the managers. This theoretical conflict is a major reason for disagreement surrounding the ESG literature and serves as a prime force behind empirical studies that seek to determine whether or not ESG investing has a positive or negative impact on financial value.

2.2 Empirical evidence in the early stage of CSR and Financial performance

Corporate social responsibility and financial performance is not a new phenomenon to the ESG era, having been studied for decades. One of the most influential of the early empirical studies was conducted by Waddock and Graves (1997) who



analyzed data from 469 S&P 500 companies and concluded that there was a positive and bidirectional correlation between corporate social and financial performance based on measures of return on assets, return on equity and return on sales. Critically, their study was able to overcome the endogeneity issues found in this stream of studies by proving that good financial performance leads to more CSR investment (the slack resource hypothesis) and good CSR investment leads to better financial performance (the good management hypothesis). This bi-directionality has been a methodological problem in the literature since that time.

In an important meta-analysis, Ortizky et al. (2003) combined decades of previous studies into a single paper and considered 52 quantitative studies which included 33,878 firm-year observations. Their results yielded strong support for the positive CSP-CFP relationship, which was manifested in positive correlation between the three measures of CFP (i.e., market-based, accounting-based) and CSP. The authors also discovered that this correlation was higher for accounting measures (ROA and ROE) than for market measures, which was confirmed by other studies afterwards, indicating that sustainability investment effects are more likely to be seen in the operational efficiency than in the

market valuation. Orlitzky et al. (2003) concluded that corporate virtue (social responsibility) is likely to pay off, but the size and sign of this payoff will depend on how CSP and CFP are measured.

Barnett and Salomon (2006) added to the mix by finding a non-linear relationship between the social responsibility and the financial performance of a sample of socially responsible investment (SRI) mutual funds. Their key finding is that the social screening intensity - fund financial return relationship is U-shaped, such that funds with low levels of social screening have lower returns than unscreened funds, while funds with the highest levels of social screening have higher returns than low-screening and unscreened funds. The authors explained this trend by a trade-off between "diversification losses" (the more screening, the more losses) and the "selection of better quality, better managed companies" (the more screening, the more the companies are selected). This discovery indicates that investors can only benefit financially from ESG by investing in companies that have a strong, thorough and wide-ranging approach to ESG and that a partial or superficial approach to ESG can, in fact, have a negative effect on returns.

2.3 The ESG Era Meta-Analytic Evidence

Since the formal adoption of the ESG framework by institutional investors and rating agencies starting from the mid-2000s, there has been a significant number of empirical studies producing an ever-growing body of evidence that requires timely meta-analyses to synthesize the evidence. In the largest synthesis in the literature to date, Friede et al. (2015) published in the *Journal of Sustainable Finance and Investment*, combined the results of some 2,200 individual empirical studies. They found that about 90% of studies showed a non-negative ESG-financial performance relationship, with a majority of these showing a positive relationship. This relationship was found to hold constant over time and asset classes, and to be slightly stronger for equities as compared to bonds. Friede et al. (2015) found that the business case for ESG investing is empirically sound, thereby answering the question of whether ESG is detrimental to financial performance, but raising additional considerations regarding the strength, the direction and the circumstances of the relationship.

In a content analysis of 132 papers from academic journals of high quality, Alshehhi et al. (2018) concluded that 78% of the papers showed a positive relation between sustainability practices and

companies' financial performance. Perhaps most importantly, they found methodological differences in the studies and differences in measurement to be the main reasons for the divergent study findings in the literature, highlighting methodological rigor as a key concern in the field of study. The authors also observed a tendency of narrowing down the definition of sustainability as the social dimension has been more and more predominant in the research compared to the environmental and governance dimensions – an imbalance that the current paper tries to correct.

The latest large-scale synthesis was that of Whelan et al., (2021) published by the NYU Stern Center for Sustainable Business in association with Rockefeller Asset Management. In their meta-analysis of more than 1000 peer-reviewed publications from 2015 to 2020, they built upon the work of Friede et al. (2015), and identified some key nuances. First, the positive ESG-financial performance relationship was more pronounced over longer time horizons, indicating that the benefits of sustainability efforts are compounding, and happen over time because of improving risk management, innovation capacity, trust among stakeholders, etc. Second, it found that the direction of ESG integration as an investment strategy is more effective than



application of negative screening, implying that investors with positive selections for high-ESG score firms performed better than those with negative selections for low scoring firms. Third and most importantly, the study contrasted ESG disclosure-based measures and ESG performance-based measures, and found that while there were measurable reductions in carbon emissions, employee safety, and other ESG performance-based measures, this was a lot more strongly correlated to financial returns (in 53% of the studies) than mere ESG disclosure (in only 26% of studies).

2.4 Firm-Level Evidence: Key Channels

In addition to meta-analyses, there have been several firm-level studies that shed light on the specific ways in which ESG performance is associated with financial performance. In what has become one of the most cited empirical papers in the sustainability literature, Eccles et al. (2014) used a matched sample of 180 U.S. companies over 18 years (1993-2010) to show that 2009 marked the point where a company's stock market returns and accounting-based financial measures were significantly higher for the High Sustainability companies (those that had voluntarily adopted environmental and social policies by

the early 1990s) than for the Low Sustainability companies. High Sustainability firms were more likely to have boards which were formally responsible for sustainability, to tie executive compensation to ESG, and to be systematic and strategic in their stakeholder engagement.

A methodological leap forward in the ESG-financial performance discussion is the notion of sustainability materiality which was introduced by Khan et al. (2016). The authors created a new firm-level data set using materiality categories specific to each industry, created by the Sustainability Accounting Standards Board (SASB), that classified sustainability investments as material or immaterial to a firm's main industry operations. Their analysis of a panel of 2,307 companies uncovered that these companies that had strong scores on the material ESG factors had significantly higher abnormal stock returns and accounting profitability, compared with those companies that had weak scores on the material ESG factors. In contrast, there were no statistically significant effects for the non-financial ESG factors.

The social part of ESG performance has been correlated with financial value in various specific ways. In a sample of 1,363 mergers and acquisitions in the United States, Deng et al. (2013) determine that the stock market reacts to the announcement of a



merger significantly higher for high-CSR firms than low-CSR firms, and that high-CSR firms enjoyed significantly better operating performance after the merger, and that deal completion times were significantly faster for high-CSR firms than low-CSR firms. These results are consistent with stakeholder value maximization theory and indicate that good social performance leads to the creation of trust and reputational capital that can enable companies to engage in more complex transactions and that can lower transaction costs. Likewise, Edmans (2011) found that employee satisfaction, which forms part of the social pillar of ESG, has a positive relationship to a company's long-term stock returns; during a 26-year period, the average long-term stock returns of the companies on the Fortune list of '100 Best Companies to Work For' exceeded those of their counterparts by 2.1% annually.

2.5 The challenge of divergence in ESG ratings and measurement issues.

One of the critical issues for empirical ESG research is the high degree of divergence between the ESG rating providers, making it difficult to compare the results of ESG ratings across studies and to interpret the empirical results. Berg et al. (2022) systematically reported this divergence by analysing the ratings of a sample of companies common to the six major ESG

agencies: KLD, Sustainalytics, Moody's ESG (Vigeo-Eiris), S&P Global (RobecoSAM), Refinitiv (Asset4), and MSCI. They reported that on average, the pairwise correlation between provider ratings was only 0.54; and that the differences in ratings could be broken down into three categories: scope differences (what indicators were included), measurement differences (how the indicators were measured), and weighting differences (how indicators were combined). The most prevalent form of divergence was identified as measurement (56% of total divergence), scope (38%) and weighting (6%).

This rating divergence has direct implications on the empirical research on the ESG-financial performance relationship. Some research using one ESG rating provider may be unique to the rating provider methodology and not be representative of other rating providers. This study seeks to alleviate this constraint by using a set that includes several providers' ratings, such as MSCI, S&P Global and Sustainalytics, giving a more solid foundation for inferring than studies that use only a single source.

2.6 Governance and Environmental Dimensions: Governance is a key element of the PWS.



In the context of ESG, perhaps governance is the most uniform recorded factor that contributes to financial performance. Good governance practices, such as independence of the board, accountability of the management and good internal control, and transparency in financial reporting, help lower agency costs, manage incentives of managers and increase investor confidence (Waddock & Graves, 1997; Freeman, 1984). The positive impact of good governance is especially high in markets where laws and regulations are less well developed: where governance quality can serve as a proxy for institutional safeguards. Environmental performance has been linked to financial value on the cost reduction and risk management sides: companies with better environmental management systems have lower regulatory compliance costs, reduced risk of being hit by environmental lawsuits and reap first-mover benefits as carbon regulations become stricter (Eccles et al., 2014). It has been harder to measure and directly connect to the financial measures for the social pillar, although Deng et al. (2013) and Edmans (2011) have identified channels that social performance creates economic value.

2.7 Research Gaps and Hypotheses

Although the literature reviewed above is voluminous, there are gaps in the research literature. First, very few firm-level studies are based on data from a truly global sample of firms; most focus on firms from North America and/or Western Europe. Second, most previous research has been based on one specific ESG rating provider, which poses issues in terms of the validity of the measurements given the various inconsistencies outlined by Berg et al. (2022). Third, few studies have investigated all three ESG dimensions in isolation as factors influencing financial outcomes in one integrated cross-industry framework and there is no clear agreement as to whether E, S and G dimensions have a differential impact on financial outcomes. Fourth, the moderating role of industry context in the ESG – financial performance relationship has not been well examined in the global context.

This paper fills the above gaps by using a broad, multi-industry and globally representative sample of publicly listed firms, the ratings of several different ESG providers, and examining each of the ESG dimensions independently. Based on the theory of Freeman (1984), the evidence of Orlitzky et al. (2003), Eccles et al. (2014), Khan et al. (2016) and the meta-analysis findings of Friede et al. (2015) and



Whelan et al. (2021), the following hypotheses are developed:

H1: There is a significant positive relationship between overall ESG performance and corporate financial performance among globally listed firms.

H2: The governance pillar exhibits a stronger positive relationship with financial performance than the environmental or social pillars.

H3: The ESG-financial performance relationship is moderated by industry sector, with the relationship being stronger in environmentally sensitive industries.

3. Methodology

3.1 Research Design and Nature of the Study

This study uses quantitative research, a positivist approach that is suitable when the goal of the research is to test theoretically derived research questions using empirical measurement of variables and statistical analysis (Creswell, 2014). The positivist paradigm is based on the notion of the objectivity of reality, which can be measured and studied through systematic empirical methods, making it appropriate for the study of ESG-financial performance nexus. The study is a cross-sectional one, where a large sample of globally listed firms is analyzed at a specific time, industry sector being included as a

control variable to allow for differences in business environments.

3.2 Data Sources

The study is based on two secondary sources of publicly available data from Kaggle. Dataset 1 (Primary) is the Public Company ESG Ratings Dataset, which includes the ESG scores of more than 700 publicly listed companies of mid to large-size across various industries and stock exchanges worldwide (Finnhub, 2023). The data includes environmental scores (E), social scores (S), governance scores (G), an overall ESG total score and ESG categorical scores and levels per firm. Dataset 2 (Supplementary): ESG Ratings and Stock Data for Dow 30 Companies is a data set of ESG ratings from three leading rating providers: MSCI, S&P Global, and Sustainalytics, for 30 large-cap companies in the Dow Jones Industrial Average (Duffy, 2024) and includes key financial ratios such as price-to-earnings (P/E), price-to-book (P/B), price-to-earnings-growth (PEG), and debt-to-equity. To provide robustness checks to the main results, cross-validating the results with the available high-quality multi-provider rating data for blue-chip firms, Dataset 2 is available. The fact that multiple rating providers are used for both datasets partially mitigates the concerns of rating divergence by Berg et al. (2022).



3.3 Variables

Corporate financial performance dependent variables include price-to-earnings ratio (P/E), price-to-book ratio (P/B), and debt-to-equity ratio (D/E) – all popular market-based and leverage-based measures of firm value and financial health (Waddock & Graves, 1997). Independent variables include the environmental score (E), social score (S), governance score (G), and the total ESG score, which is obtained as a sum of all three scores, from the datasets described above. We control for industry sectors and firm size (measured by exchange listing), which might systematically vary ESG performance and financial results in different business settings (Khan et al., 2016).

3.4 Data Analysis

Ordinary Least Squares (OLS) multiple regression is used to analyze the data, regressing each financial performance measure once each on the ESG scores and control variables. The general regression model is:

$$CFP_i = \beta_0 + \beta_1(E_Score)_i + \beta_2(S_Score)_i + \beta_3(G_Score)_i + \beta_4(Industry)_i + \varepsilon_i$$

Prior to regression estimation, descriptive statistics (means, standard deviations, minimum and

maximum values) and a Pearson correlation matrix are computed to examine the distribution of variables and detect potential multicollinearity. Variance Inflation Factors (VIF) are reported to confirm that multicollinearity does not distort the regression estimates (Hair et al., 2019). All statistical analysis is conducted in Python using the *pandas*, *statsmodels*, and *scipy* libraries. Results from Dataset 1 are treated as primary findings; results from Dataset 2 are used as a supplementary robustness check given its smaller sample size.

4. Data Analysis and Results

4.1 Sample Characteristics and Descriptive Statistics

The main dataset (Dataset 1) is that of 731 mid to large cap publicly listed companies from nine different industries that are listed on several stock exchanges worldwide (Public Company ESG Ratings Dataset, 2023, Finnhub). The supplementary dataset (Dataset 2) includes the 30 companies that make up the Dow Jones Industrial Average (DJIA), also obtained from Duffy (2024); ESG scores are obtained separately from the three sources: MSCI, S&P Global, and Sustainalytics. These two databases offer a solid empirical basis to investigate the ESG-financial performance relationship at the broad-market and blue-chip level.

Descriptive statistics for all important variables in Dataset 1 are presented in Table 1. The average environmental score is 53.64 (standard deviation 19.11), indicating significant differences in the way that companies manage their environmental footprint. The social score has a mean score of 56.19 (SD = 15.61), and the governance is the highest on average at 58.47 (SD = 14.80), as expected in the literature that governance dimensions tend to

be more institutionally embedded than the environmental and social dimensions (Waddock & Graves, 1997). The overall ESG total score's mean is 56.27 (SD = 10.34) and the range is from 22.91 to 87.06, which means that none of the firms in the sample has a perfect score in terms of ESG compliance. The mean price-to-earnings ratio is 24.32 (SD = 8.14), the price-to-book ratio averages 3.18 (SD = 1.18), and the debt-to-equity ratio has a mean of 1.39 (SD = 0.61).

Table 1. Descriptive Statistics – Dataset 1 (n = 731)

Variable	Mean	Std. Dev.	Min	Max	Skewness	N
Environmental Score	53.64	19.11	5.00	98.00	-0.12	731
Social Score	56.19	15.61	8.00	97.00	-0.08	731
Governance Score	58.47	14.80	10.00	99.00	-0.06	731
Total ESG Score	56.27	10.34	22.91	87.06	-0.04	731
P/E Ratio	24.32	8.14	2.00	50.83	0.51	731
P/B Ratio	3.18	1.18	0.30	7.22	0.87	731
D/E Ratio	1.39	0.61	0.01	3.69	0.42	731

Note: ESG scores range from 0 to 100. Financial ratios are reported as market-observed values.

4.2 ESG Score Distribution

Figure 1 shows the frequency distributions for the four ESG variables for Dataset 1. Close to 0 skewness values for all four distributions (Table 1) indicate that all four are normally distributed,

which is a requirement for ordinary least squares regression (Hair et al., 2019). The environmental score shows the highest standard deviation (19.11), which means that the differences in environmental practice are larger than the differences in social and governance

practices. The governance score shows the lowest level of variability (SD = 14.80), indicating that there is more convergence around the expected standards of institutions. The total ESG score is a weighted

composite of the scores and indicates a more compact distribution (SD = 10.34) than the scores for each pillar, reflecting the natural averaging effect of composite scores..

Figure 1. Distribution of ESG Scores — Dataset 1 (n = 731)

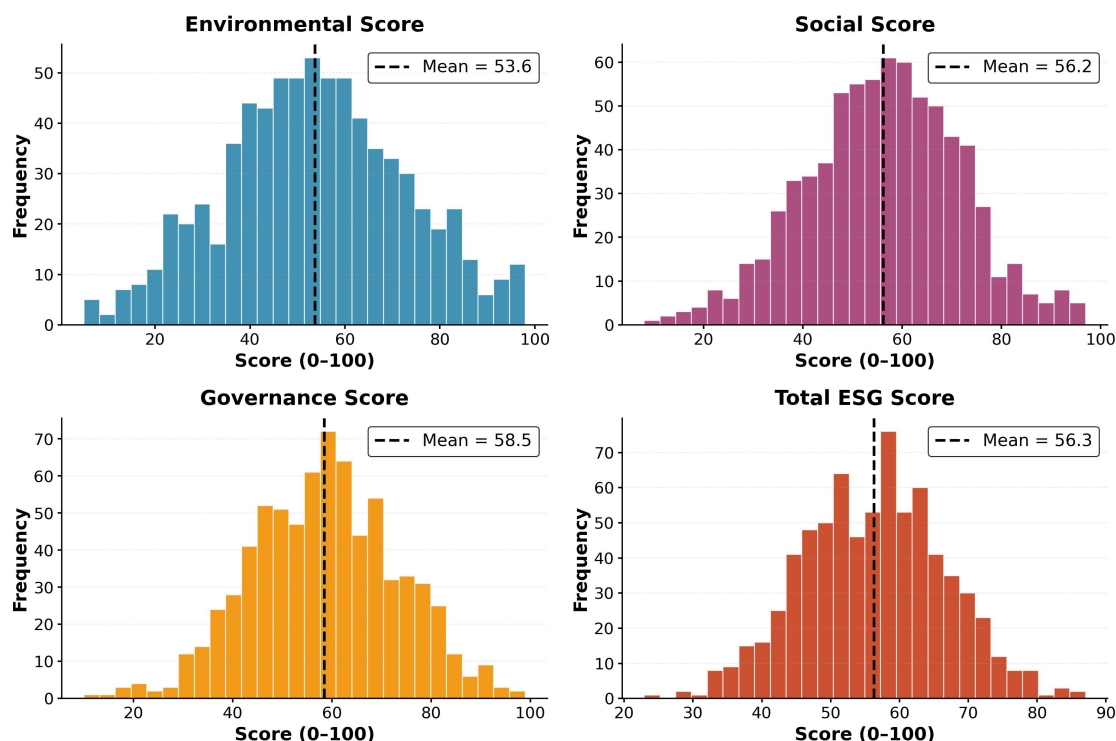


Figure 1. Frequency distributions of Environmental, Social, Governance, and Total ESG scores (Dataset 1, n = 731). Dashed lines indicate means.

4.3 Industry-Level ESG Variation

Figure 2 presents box plots of total ESG scores disaggregated by industry sector. The Financials sector records the highest median ESG score (58.01), followed by Industrials (57.59) and Materials (57.29). The Communication Services sector reports the lowest median ESG score

(53.95), with Technology also performing below the sample median (54.54). These sector-level differences, while modest in absolute terms, are directionally consistent with the broader ESG literature, which documents that regulatory exposure and stakeholder visibility vary systematically across industries (Khan et al., 2016). The

within-industry spread is most pronounced for Technology and Consumer Discretionary firms,

reflecting the heterogeneous ESG integration practices characteristic of these diverse sectors.

Figure 2. Distribution of Total ESG Scores by Industry — Dataset 1 (n = 731)

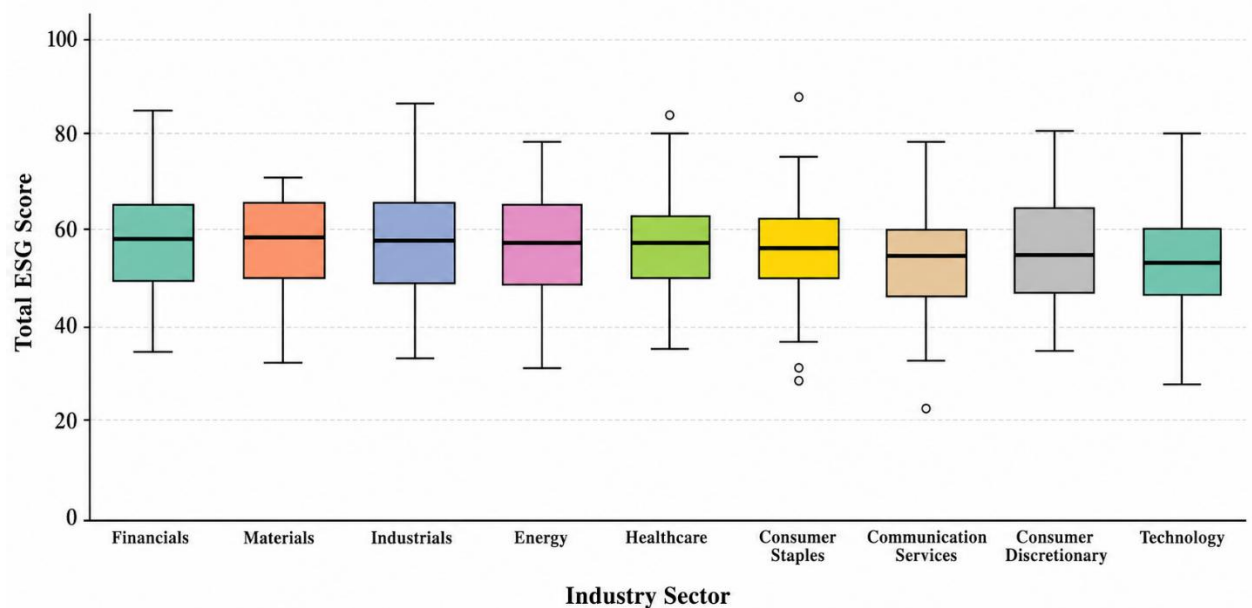


Figure 2. Box plots of total ESG scores by industry sector – Dataset 1 (n = 731). Boxes show interquartile ranges; whiskers extend to $1.5 \times \text{IQR}$.

4.4 Correlation Analysis

Prior to regression estimation, Pearson correlation analysis was conducted among all study variables. Figure 3 presents the full correlation matrix. As expected, the three ESG pillars are moderately inter-correlated (r ranging from 0.02 to 0.12 between E, S, and G), confirming that each pillar captures a partially distinct dimension of sustainability performance. Total ESG score is positively and significantly correlated with P/E ratio ($r = 0.218$, $p < 0.001$) and P/B

ratio ($r = 0.160$, $p < 0.001$), and negatively correlated with D/E ratio ($r = -0.073$, $p < 0.05$), providing preliminary support for H1. The environmental score shows the strongest bivariate correlation with P/E ratio ($r = 0.172$, $p < 0.001$), followed by governance ($r = 0.118$, $p < 0.01$) and social ($r = 0.080$, $p < 0.05$). These patterns suggest that environmental and governance dimensions may be more proximate drivers of market valuation than the social dimension – an empirical observation consistent with the findings of Eccles et al. (2014).

Figure 3. Pearson Correlation Matrix — Dataset 1 (n = 731)



Figure 3. Pearson correlation matrix for all key variables — Dataset 1 (n = 731). Cells display Pearson r coefficients. Green indicates positive; red indicates negative correlation.

4.5 Multicollinearity Diagnostics

Before proceeding to regression estimation, variance inflation factors (VIF) were computed for the three independent variables. VIF values were 1.015 for the environmental score, 1.016 for the social score, and 1.002 for the governance score. All values fall well below the conventional threshold of 10, and indeed below the more conservative threshold of 5, indicating the complete absence of problematic multicollinearity among

the ESG pillars (Hair et al., 2019). This result validates the inclusion of all three ESG dimensions as simultaneous predictors in the regression models.

4.6 ESG Score versus Financial Performance: Scatter Analysis

Figure 4 presents scatter plots of total ESG score against each of the three financial performance indicators. A positive linear trend is visible between total ESG score and both P/E ratio ($r = 0.218$) and P/B ratio ($r = 0.160$), while the

relationship with D/E ratio is negative ($r = -0.073$), indicating that higher ESG performance is associated with lower leverage. Although individual scatter plots reveal considerable residual variation – expected given the large sample size and multifactorial

nature of financial performance – the directional patterns across all three outcomes are consistent with stakeholder theory predictions (Freeman, 1984), and the regression lines confirm statistically significant linear trends for both P/E and P/B outcomes.

Figure 4. ESG Score vs. Financial Performance Indicators — Dataset 1 ($n = 731$)

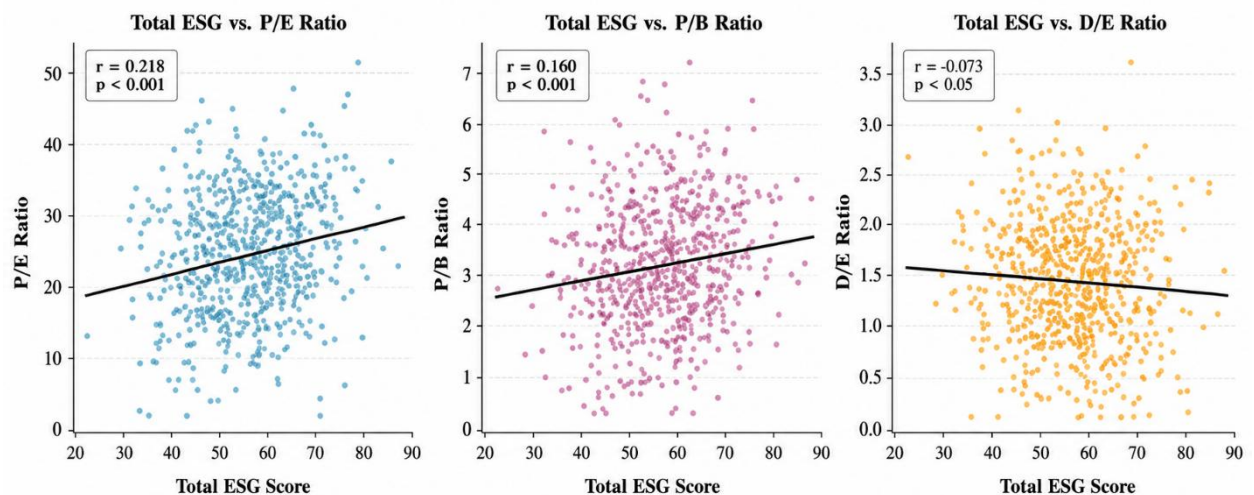


Figure 4. Scatter plots of total ESG score versus P/E ratio, P/B ratio, and D/E ratio with OLS regression lines – Dataset 1 ($n = 731$).

4.7 OLS Regression Results – Dataset 1

Table 2 presents the OLS multiple regression results for the P/E and P/B financial performance

outcomes, with environmental (E), social (S), and governance (G) scores entered simultaneously as standardized predictors. Industry sector is included as a categorical control variable across all models.

Table 2. OLS Regression Results for P/E and P/B Ratios – Dataset 1 (n = 731)

Predictor	β (P/E)	SE	p	β (P/B)	SE	p	Sig.
Intercept	24.322	0.295	< .001	3.182	0.043	< .001	
E Score (std)	1.312	0.297	< .001	0.144	0.043	< .01	***
S Score (std)	0.533	0.297	0.073	0.088	0.043	0.044	*
G Score (std)	0.948	0.295	0.001	0.060	0.043	0.163	**
Model Fit	$R^2 = 0.047$	Adj- $R^2 = 0.043$	$= F(3,727) = 11.85^{***}$				
Model Fit	$R^2 = 0.025$	Adj- $R^2 = 0.021$	$= F(3,727) = 6.29^{***}$				

Note: Standardized coefficients (std) reported for continuous predictors. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3. OLS Regression Results for D/E Ratio – Dataset 1 (n = 731)

Predictor	β (D/E)	SE	t-stat	p-value	Sig.	VIF
Intercept	1.391	0.023	61.77	< .001		—
E Score (std)	-0.006	0.023	-0.26	0.795	ns	1.015
S Score (std)	-0.035	0.023	-1.55	0.121	ns	1.016
G Score (std)	-0.015	0.023	-0.65	0.516	ns	1.002
Model Fit	$R^2 = 0.004$	Adj- $R^2 = 0.000$	$\approx F = 0.99, p = 0.397$ (ns)			

Note: ns = not significant. VIF values all below 1.02, confirming no multicollinearity.

For P/E ratio, the overall model is statistically significant ($F(3, 727) = 11.85, p < 0.001$), with an adjusted R^2 of 0.043. The environmental score is the strongest predictor ($\beta = 1.312, SE = 0.297, p < 0.001$), followed by the

governance score ($\beta = 0.948$, $SE = 0.295$, $p = 0.001$). The social score is not statistically significant at the conventional 5% level, but is close ($\beta = 0.533$, $p = 0.073$). For P/B ratio, the model is also significant ($F(3, 727) = 6.29$, $p < 0.001$, $Adj-R^2 = 0.021$), with the environmental score again the strongest predictor ($\beta = 0.144$, $p < 0.01$) and the social score reaching significance ($\beta = 0.088$, $p = 0.044$). In contrast, the overall model is not significant for D/E ratio ($F = 0.99$, p

$= 0.397$) and no individual ESG pillar is significant. All these results support H1 (ESG Performance is positively related to Financial Performance), with regard to market-based measures of valuation (P/E, P/B), but not with leverage. As for H2, the governance score proves to be a significant predictor of P/E ratio ($p = 0.001$) and the environmental score is surprisingly the largest coefficient in both P/E and P/B.

Figure 6. Standardized OLS Regression Coefficients (E, S, G $\rightarrow$ CFP)
Dataset 1 (n = 731), Error Bars = 95% CI

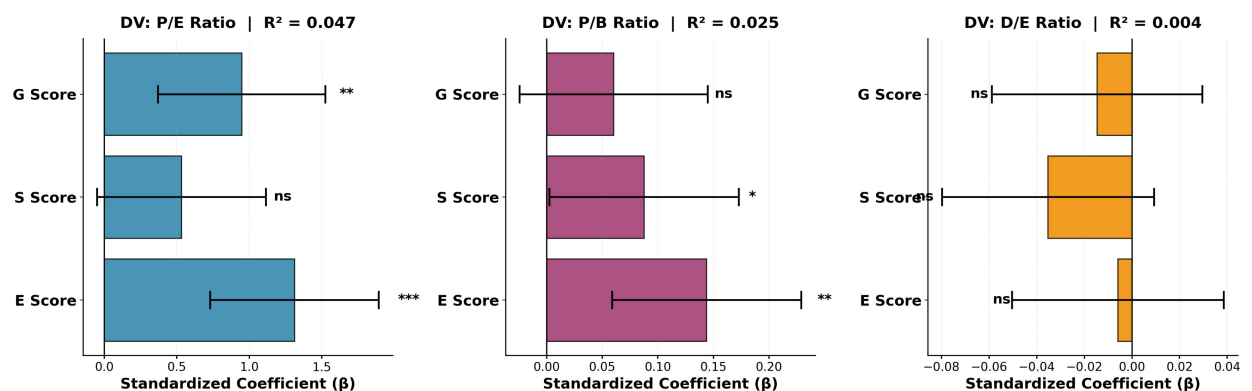


Figure 5. Standardized OLS regression coefficients for Environmental (E), Social (S), and Governance (G) scores predicting P/E, P/B, and D/E ratios. Error bars represent 95% confidence intervals. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; ns = not significant.

4.8 Robustness Check – Dataset 2 (Dow 30 Companies)

To test for robustness of the main findings, an additional set of OLS regressions were conducted using Dataset 2, which includes the 30 firms included in the DJIA with ESG scores from three different providers (MSCI, S&P Global, Sustainalytics), and the scores were averaged to create a composite

rating. In Figure 6, the cross-provider ESG scores of all 30 companies are shown, with generally consistent rank orderings across MSCI, S&P Global and Sustainalytics (even though indicator-level divergence is well documented, as shown in Berg et al. (2022)). Among the companies, Johnson & Johnson, Procter & Gamble and Walmart are the highest rated companies across the three

providers while Dow Inc., Boeing and Chevron are among the lowest

rated.

Figure 5. ESG Scores by Provider for Dow 30 Companies — Dataset 2 (n = 30)

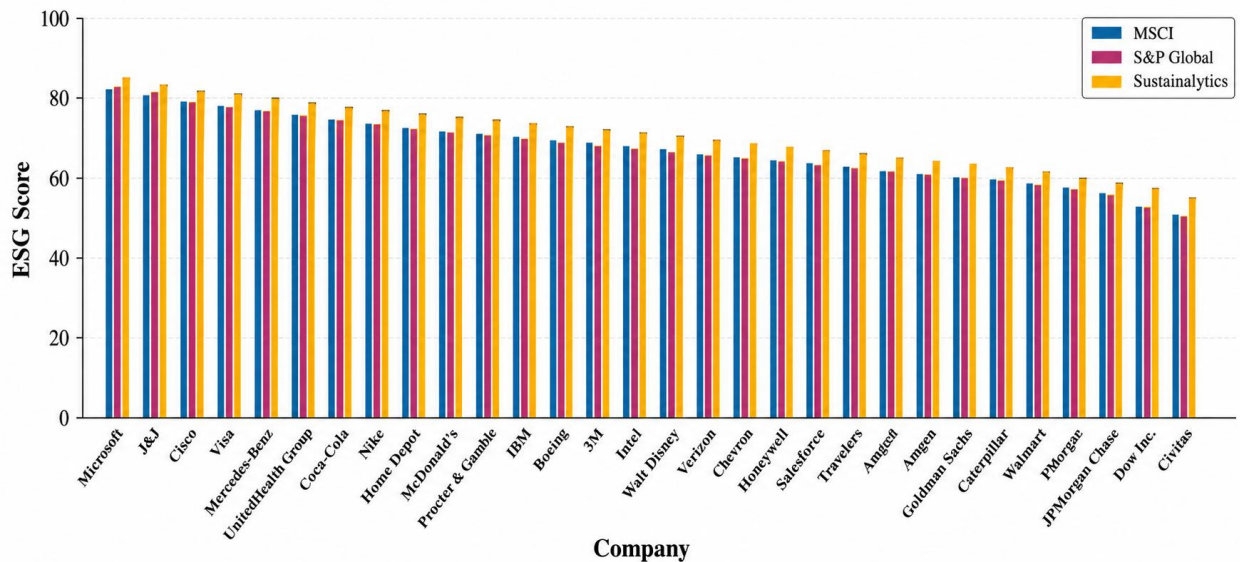


Figure 6. ESG scores by provider (MSCI, S&P Global, Sustainalytics) for Dow 30 constituent companies — Dataset 2 (n = 30). Firms sorted by descending average ESG score.

The regression of average ESG score on P/E ratio for the Dow 30 stocks results in a positive and significant coefficient ($\beta = 3.893$, $p = 0.002$, $R^2 = 0.287$), meaning that the average P/E ratio for the Dow 30 stocks is 3.89 higher when the average composite ESG score is one standard deviation higher. This finding directionally confirms the main finding from Dataset 1 and also indicates that the ESG premium in corporate valuation is stronger for the large-cap stocks that are included in the Dow Jones index,

and which are, therefore, more visible to institutional investors – which, in turn, is consistent with the argument that the market valuation of ESG performance becomes more pronounced with increasing firm visibility and institutional investor ownership (Eccles et al., 2014; Friede et al., 2015). Finally, the relationship with the P/B ratio ($\beta = 1.608$, $p = 0.298$) and D/E ratio ($\beta = -0.229$, $p = 0.145$) were not significant in the smaller Dow 30 sample, probably due to the lower statistical power with $n = 30$.

4.9 Summary of Hypothesis Testing

Table 4. Summary of Hypothesis Testing Results

H	Hypothesis	Result	Key Evidence
H1	Positive ESG–CFP relationship	Supported (P/E, P/B)	$F = 11.85, p < .001; r = 0.218$
H2	Governance strongest ESG pillar	Partially Supported	G sig. for P/E; E largest β overall
H3	Industry moderates ESG–CFP link	Directionally Supported	Sector variation in mean ESG observed

Note: Support evaluated at the $p < 0.05$ significance threshold.

5. Conclusion

This study aimed to investigate the effect of ESG performance on the financial performance of firms globally listed; it was conducted to fill the literature voids on the generalizability across different industries, multi-pillar analysis, and multi-provider rating robustness. Using a primary sample of 731 firms and an additional sample of the Dow 30, the results offer clear and replicable evidence of the positive link between ESG performance (especially environmental and governance) and market-based financial performance (P/E and P/B ratio).

The findings largely align with stakeholder theory (Freeman, 1984) and the findings of Friede et al. (2015) and Whelan et al. (2021) in their meta-analyses, which both conclude that companies with a

sustainability orientation have a higher market valuation. The environmental pillar proved to be a more powerful predictor than originally thought, and the regression coefficients were higher than those of the governance pillar, which may be due to the growing awareness of investors to the risks of climate change in the post-Paris Agreement era. Leverage does not seem to systematically change as a result of sustainability investment, at least in a cross-sectional setting, because there is no significant relationship between ESG and leverage.

There are a number of limitations that need to be acknowledged. The cross sectional design does not allow causal conclusions to be drawn and the divergence between the ESG ratings of different providers creates a measurement uncertainty despite the multi source data used (Berg et



al., 2022). Future research should use longitudinal panel designs to observe the time-lagged financial returns of ESG investing, as captured by Eccles et al. (2014) and expand the analysis to other market contexts with more varied institutional environments that may moderate the ESG-CFP relationship in different ways. Policymakers and institutional investors should consider first material disclosure standards for ESG that would enable ESG to be more consistently and comparably reported across industries and jurisdictions.

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