The Relationship Between Financial Performance And ESG: Evidence from Bloomberg

Kaifeng Zhou

Rutgers Business School, Rutgers University, New Jersey, United States

kz259@scarletmail.rutgers.edu

Abstract. This study delves into the relationship, between Environmental, Social, and Governance (ESG) metrics and company performance. Through regression analysis, the research examines data from known companies across industries and regions to understand how ESG scores impact stock prices. The results reveal a link indicating that improvements in ESG practices often lead to stock values, especially in wealthier sectors and stable economic conditions.Of note is the emphasis on governance aspects within the ESG framework, which significantly influences performance indicators in banking and securities. This underscores the importance of ESG factors in decision-making and their growing significance as indicators of investor interest and market trends. The study shows that a company's dedication, to practices, is now factored into its market worth with governance playing a role that demands attention from both corporations and regulatory bodies. The research findings have implications demonstrating that a company's ESG performance reflects its ethical stance and contributes tangibly to its financial value. This valuable insight is crucial, for businesses looking to match their sustainability initiatives with investor demands and for industry analysts trying to grasp the impacts of social responsibility projects. From this perspective, the study provides advice, on how ESG strategies can be implemented to meet sustainability goals and improve outcomes promoting lasting stability and progress.

Keywords: Regression analysis; ESG; sustainability performance; financial performance; corporate governance.

1. Introduction

Emerging discussions around corporate environmental, social, and governance (ESG) practices, highlighting the potential for these practices to have an impact on financial performance, provide the context for this study. As ESG factors become an integral part of investment decisions and operational strategies, understanding their impact on financial performance becomes critical. Therefore, this study aims to explore the correlation between ESG scores and key financial metrics such as return on assets (ROA) and return on equity (ROE). Qureshi et al. present a study that investigates the link between ESG performance and financial outcomes for firms identified as "100 Best Corporate Citizens," using a panel vector autoregression approach to address methodological challenges and find a predominantly positive ESGP–CFP relationship [1]. The premise is that excellent ESG performance may imply sound sustainability practices that have the potential to improve the financial health of the business.

Methodologically, this study used ordinary least squares (OLS) regression analysis to assess the predictive power of ESG scores for ROA and ROE. OLS was chosen based on its widespread acceptance in linear coefficient estimation, making it a suitable tool to explore the effects of ESG factors. Oprean-Stan et al. utilized multifactorial linear regressions to examine the relationship between sustainability reporting, management of ESG factors, and corporate performance, acknowledging the widespread acceptance of OLS in linear coefficient estimation and its suitability for analyzing the effects of ESG factors [2]. The sample includes data on 100 companies in 2022, carefully extracted from the Bloomberg database. The sample broadly represents market conditions to ensure that the conclusions are robust and externally valid.

This study is not limited to empirical investigation. It provides an in-depth look at specific ESG components related to financial returns and guides corporate ESG strategy and investor decisions. The comprehensive literature review on ESG and CSR practices, as encapsulated in "A Survey on

ESG: Investors, Institutions, and Firms," discusses the multifaceted nature of ESG components and their implications on firm performance, thereby providing the groundwork for understanding how these factors interplay with financial returns and guide both corporate strategy and investor decision-making processes [3]. It is also clear that environmental, social, and governance practices have different impacts on a company's financial direction. The framework for this research has been carefully designed to drive logical fluency in information and analysis. Following the introduction, subsequent sections will delve into a comprehensive literature review, expound the methodology in more detail, analyze and discuss the findings, and conclude with implications for theory and practice. This systematic approach not only helps to clarify the theoretical basis and methodological rigor of the research but also demonstrates the importance of its practical contributions in the field of sustainable finance and corporate governance.

2. literature review

The existing research, on the link between Environmental, Social, and Governance (ESG) performance and company value shows a changing connection. In a study by Sun, the relationship between ESG scores and stock prices in sectors and regions is thoroughly examined, revealing a positive link. This positive association implies that enhancements in ESG scores often correspond to increases in a company's stock price in high end sectors and thriving regions [4].

In another study by Lee and Liu is the influence of ESG scores on the performance of A-share banks and securities companies is explored, indicating that governance (G) scores have an impact on corporate performance. Their findings suggest that emphasizing information disclosure a key aspect of governance can lead to corporate performance. They propose that improving governance scores could be a shortcut to enhancing performance [5].

Both pieces of research add insights to the field by examining how ESG impacts performance with one focusing on stock price correlations while the other emphasizes direct effects on corporate performance. Additionally, Lee and Liu's study highlights the significance of governance within the ESG framework supporting literature findings that stress the importance of governance, in evaluating a firm's practices.

These recent studies suggest an agreement, on the impact of ESG factors on company value. This impact varies depending on the conditions in sectors and countries the specific elements of the ESG rating and how these connections are measured. The conclusions drawn from this research could be valuable, for investors and business leaders as they maneuver through the realm of investing and aim to incorporate ESG factors into their long-term planning strategies.

3. Methodology

3.1. Sample

For the analysis presented in this article, this research drew on data covering different companies. The data is derived from the Bloomberg database, which includes certain financial and non-financial measures. Rossi, F., & Harjoto, M has a study in this area, the study employs data from a variety of non-financial and financial measures, acknowledging Bloomberg as one of the databases for the collection of such metrics, to investigate the relationship between corporate non-financial disclosure ratings and firm performance among Italian listed companies [6]. The author selected 100 companies and analyzed their data for 2022, providing a comprehensive time frame to evaluate the validity of the findings under different market conditions.

3.2. Methodology

The methodology selected for this research is Ordinary Least Squares (OLS) regression analysis. This method is widely recognized for its efficiency in estimating the coefficients of a linear regression model. OLS aims to find the line that minimizes the sum of squared differences between the observed

values and the values predicted by the linear model. It is an essential tool in statistical analysis, providing the best linear unbiased estimates under the Gauss-Markov theorem, given that the assumptions of the model are satisfied. Chan et al. review methods addressing the multicollinearity issue in regression analysis, underscoring Ordinary Least Squares (OLS) for its objective of minimizing the sum of squared differences between observed and predicted values, thus providing the best linear unbiased estimates under the Gauss-Markov theorem, subject to model assumptions being satisfied [7]. The regression equation for this research, represented as Equation (1), is designed to examine the relationship between the firm size and various independent variables:

$$Y = B_0 + B_1X_1 + B_2X_2 \quad (1)$$

In this formula, Y represents the size of the company, which is what the research are mainly focusing on in the study. The variable X_1 is thought to have an impact, on the company's size. The coefficient B_0 is the starting point of the model showing what Y would be when X_1 and other factors are zero. The slope coefficient B_1 shows how Y is expected to change when X_1 changes by one unit while keeping factors constant. Furthermore, X_2 acts as a control variable like the value to consider other influences on company size not central to the research. The coefficient B2 for this control variable indicates how Y is expected to change with a one-unit alteration, in X_2 with all other aspects unchanged. The values of coefficients B_0, B_1, and B_2 are factors that the OLS regression will calculate. Together this model will allow us to measure and understand the influence of both the control variables, on company size.

3.3. Variables

3.3.1 Dependent variable

The dependent variable chosen by the authors is the return on equity (ROE) and return on asset (ROA) and is not processed by any data. ROE and ROA a key financial ratios used to measure a company's profitability relative to its equity. It directly reflects a company's financial leverage and efficiency in using shareholder capital to create profits. This study acknowledges the significance of financial ratios such as ROE and ROA in determining a company's profitability about its equity, underlining their importance in financial analysis and performance evaluation [8]. ROE and ROA were chosen as the dependent variables for consistency, as they reflect raw, unprocessed financial performance. This metric is valuable to stakeholders, including potential investors and company management, who want to understand that operational efficiency has a pure impact on shareholder value. Unprocessed ROE provides a candid baseline to assess the impact of corporate governance and sustainable practices on profitability.

3.3.2 Independent variable

ESG scores (environmental, social, governance) are used as independent variables without any prior manipulation to maintain the integrity of the original data. These scores represent a company's compliance with environmental management, social responsibility, and governance ethics and are scored according to reporting to ensure they accurately reflect the company's practices.The study develops a methodology based on Carroll's model to measure Corporate Social Performance (CSP) by considering interdisciplinary dimensions of CSR. By using a second-order factorial model constructed from manager perceptions, the methodology avoids data manipulation to maintain the integrity of original ESG scores, thus aiming to assess their true impact on financial returns, specifically ROE and ROA [9]. By analyzing unprocessed ESG scores, the author aims to truly assess their potential impact on a company's financial returns expressed in ROE and ROA. The raw scores allow us to establish a baseline relationship between ESG performance and financial outcomes, allowing stakeholders to infer the natural impact of these practices on a company's profitability.

3.3.3 Control variable

When companies consider any association between ESG scores and ROE, they use the total company value in its original state as a control variable and the data is not processed to ensure that

the association is not distorted by transformations or adjustments. This approach helps control the size of the business and recognizes the impact of market value measurement on financial ratios. By using unprocessed total value data, the company size can be accurately adjusted to independently analyze the impact of ESG scores on ROE. This fixed variable is essential to clearly maintain the firm size factor to confirm that the relationships observed in the study reflect true market conditions without any data-induced bias.

Variables: The main variables considered include ROA (return on assets) and ESG_SCORE, among others. These variables were selected to assess the correlation between financial performance and environmental, social, and governance (ESG) factors. In addition, the author analyze the relationship between ROE (return on equity) and ESG_SCORE. The driving factor for variable selection is that higher ESG scores may be associated with better financial performance.

4. Analysis and Discussion

4.1. Descriptive Analysis

Table 1. Descriptive Analysis

	Max	Min	Mean	σ	N
Dependent variable - ROE	175.00	-26.00	32.91	32.03	100
Dependent variable - ROA	34.00	-9.00	10.49	7.99	100
Independent variable – ESG score	7.95	1.24	4.96	1.17	100
Independent variable – Environmental score	9.57	0.00	5.01	1.99	100
Independent variable – Social score	8.36	0.40	3.61	1.71	100
Independent variable – Governance score	8.63	4.73	7.43	0.82	100
Control variable – company value ($M)	3,185,725	97,484	3,537,459	5,410,360	100

The descriptive analysis, in this study, offers a summary of the statistics for each variable examined. These statistics provide an insight into how the data is distributed aiding in the identification of patterns and guiding further analysis. Important statistical metrics such as the value (Max) lowest value (Min) mean and standard deviation are used for this purpose. (Table 1)

In analyzing datasets, certain statistical measures help us understand how the data is spread out and what trends it shows. The highest value, also known as the Max) represents the recorded value, for a specific variable giving us clues about any potential outliers and the upper limit of the dataset's range. On the other hand, the lowest value or minimum (Min) shows us the recorded value indicating the lower end of the data points in the range. The mean or average is calculated by adding up all the data points and dividing by how many there are giving us a reference point for the dataset. Meanwhile, standard deviation (SD) measures how variation. Spread there is in the dataset by showing us how far apart each data point is from the mean helping us understand how diverse the dataset is. These statistical tools are essential, for summarizing what makes up a dataset.

The data analyzed consists of information, from 100 companies in 2022. This data was meticulously chosen from the Bloomberg database to ensure accuracy and consistency. The analysis utilizes Squares (OLS) regression to examine how company size relates to various independent variables.

4.2. Regression Analysis Result

Table 2. Pearson correlation analysis between ROA and ESG

Pearson correlation analysis between ROA and ESG		
		ROA
ESG_SCORE	correlation coefficient	0.253*
	p-value	0.012
	sample size	98
* p<0.05 ** p<0.01		

The Pearson correlation coefficient, used in this case assesses how strong and in which direction a linear relationship exists between two variables. (Table 2) It varies from 1 to +1 with +1 indicating a linear correlation 1 showing a perfect negative linear correlation, and 0 suggesting no linear relationship. The p-value serves as a tool that aids researchers in determining the significance of their findings. This study discusses how permutation tests can be utilized to correct biased feature importance measures, where the p-value is a critical tool in determining the significance of the results obtained from such tests, aiding researchers in interpreting their findings [10]. In hypothesis testing the p-value signifies the likelihood of obtaining results as more extreme than the outcomes under the assumption that the null hypothesis is true. A low p-value (below 0.05) implies that the observed correlation is unlikely to be due to chance allowing researchers to reject the null hypothesis. Sample size denotes the number of observations or data points utilized in the analysis. A larger sample size can enhance the reliability of outcomes by decreasing the margin of error and minimizing outliers' impact.

In this examination, a Pearson correlation coefficient of 0.253 between ROA and ESG score suggests an association, between these variables. The significance of this correlation is supported by the p-value of 0.012 which falls below the threshold of 0.05 showing that the correlation observed is indeed meaningful. The study involved examining 98 companies yielding a dataset, for exploring the connection, between these financial indicators.

Table 3. Pearson correlation analysis between ROA and E score

Pearson correlation analysis between ROA and E score		
		ROA
ENVIRONMENTAL_SCORE	Correlation coefficient	0.277**
	p value	0.006
	Sample size	98
* p<0.05 ** p<0.01		

In Table 3 given shows that there is a relationship, between the ROA and the ENVIRONMENTAL_SCORE with a Pearson correlation coefficient of 0.277. The p-value linked to this correlation is 0.006, which is lower than the cutoff of 0.01 indicating a level of statistical significance. This suggests that there is a 0.6% chance that the correlation observed was by chance. With a sample size of 98, for this study, there are data points to support the accuracy of the correlation coefficient.

Table 4. Pearson correlation analysis between ROA and S score

Pearson correlation analysis between ROA and S score		
		ROA
SOCIAL_SCORE	Correlation coefficient	0.131
	p value	0.198
	Sample size	98
* p<0.05 ** p<0.01		

In the presented table, a Pearson correlation analysis has been conducted to explore the relationship between a company's Return on Assets (ROA) and its Social score (SOCIAL_SCORE). The correlation coefficient is reported as 0.131, which suggests a positive but weak association between the company's social initiatives and its financial performance as measured by ROA. (Table 4) However, the p-value for this correlation is 0.198, which exceeds the commonly accepted significance level of 0.05. This implies that the observed correlation is not statistically significant and that there is a 19.8% probability that the observed correlation could have occurred by chance.

Table 5. Pearson correlation analysis between ROA and G score

Pearson correlation analysis between ROA and G score		
		ROA
GOVERNANCE_SCORE	Correlation coefficient	0.106
	p value	0.297
	Sample size	98
* p<0.05 ** p<0.01		

The table shows the findings of a study that looked at how companies' Return, on Assets (ROA), relates to their Governance score (GOVERNANCE_SCORE) using Pearson correlation analysis. (Table 5) The calculated Pearson correlation coefficient is 0.106, which suggests a connection between a company's governance practices and its financial performance measured by ROA. The p-value for this correlation is 0.297, and the significance level of 0.05. This indicates that the relationship between ROA and GOVERNANCE_SCORE is not statistically significant with a 29.7% chance that such a weak connection could occur by chance. The analysis involved data from 98 companies indicating a sample size. It does not provide strong evidence for a significant link between the variables, in this specific data set.

Table 6. Pearson correlation analysis between ROE and ESG score

Pearson correlation analysis between ROE and ESG score		
		ROE
ESG_SCORE	Correlation coefficient	0.106
	p value	0.314
	Sample size	92
* p<0.05 ** p<0.01		

The table given displays the outcomes of a Pearson correlation examination, between the Return on Equity (ROE) of companies and their Environmental, Social, and Governance (ESG) score. (Table 6) The correlation coefficient is computed at 0.106 indicating a weak association between ROE and ESG_SCORE. The p-value stands at 0.314 signifying that this correlation lacks significance as it exceeds the alpha level of 0.05 by a significant margin. With a total of 92 companies in the sample, this study does not offer proof to imply a notable connection, between a company's equity returns and its ESG performance based on the gathered information.

Table 7. Pearson correlation analysis between ROE and E score

Pearson correlation analysis between ROE and E score		
		ROE
ENVIRONMENTAL_SCORE	Correlation coefficient	0.236*
	P value	0.024
	Sample size	92
* p<0.05 ** p<0.01		

The data, in the table displays the findings of an analysis that looked at how companies' Environmental scores (ENVIRONMENTAL_SCORE) relate to their Return on Equity (ROE) through a Pearson correlation. The analysis revealed a Pearson correlation coefficient of 0.236 indicating a connection between companies' environmental practices and their financial success measured by ROE. (Table 7) With a p-value of 0.024 lower than the alpha level of 0.05 it shows that the observed correlation is statistically significant. This means there's a 2.4% likelihood that the relationship between ROE and ENVIRONMENTAL_SCORE is random chance. The study included data from 92 companies showing a link where higher environmental ratings might lead to returns, on equity, which reflects positively on their financial performance.

Table 8. Pearson correlation analysis between ROE and S score

Pearson correlation analysis between ROE and S score		
		ROE
SOCIAL_SCORE	Correlation coefficient	-0.024
	P value	0.817
	Sample size	92
* p<0.05 ** p<0.01		

The table shows the results of examining how companies' Return, on Equity (ROE), relates to their Social Score (SOCIAL_SCORE). According to Table 8, the calculated Pearson correlation coefficient is 0.024 indicating an opposite connection between ROE and SOCIAL_SCORE. Moreover, the p-value is 0.817, which exceeds the threshold of 0.05. This higher p-value suggests that the link between ROE and SOCIAL_SCORE isn't statistically significant, and the negative correlation seen is probably by chance. With a sample size of 92 companies, this analysis provides a dataset from which to conclude the correlation. So, between these factors. In conclusion, there's no indication that a company's social performance as reflected in its SOCIAL_SCORE significantly influences its performance as measured by ROE.

Table 9. Pearson correlation analysis between ROE and G score

Pearson correlation analysis between ROE and G score		
		ROE
GOVERNANCE_SCORE	Correlation coefficient	0.135
	p value	0.198
	Sample size	92
* p<0.05 ** p<0.01		

The data, in the table shows the results of analyzing how a company's Return on Equity (ROE) is related to its Governance score (GOVERNANCE_SCORE) using Pearson correlation. (Table 9) The correlation coefficient of 0.135 indicates a connection between a company's governance standards and its ROE. However, with a p-value of 0.198 which is above the significance level of 0.05, the correlation lacks statistical significance. Therefore, the research cannot definitively state that there is a linear relationship between ROE and GOVERNANCE_SCORE among the 92 companies in the sample. In essence based on the provided data better governance scores do not show a link to returns, on equity.

4.3. Discussion

This study has delved into the connection, between performance and ESG aspects in business operations. The Pearson correlation analysis, an element of this research indicates an interplay between ESG factors and financial measures like ROA and ROE. Notably the environmental aspect of ESG shows a correlation with both ROA and ROE. This discovery supports the growing focus on sustainability implying that proactive environmental strategies may be increasingly valued by investors and could potentially boost a company's position.

In contrast social and governance factors did not show a correlation with financial performance metrics in this study. This suggests that the financial advantages of governance efforts may not be as immediate or direct as those from initiatives or their impact, on financial performance could be more intricate and possibly influenced by other factors not examined in this research. In his investigation of the effects between intangible and financial organizational performance, Moeller emphasizes the complexity of the influence of intangible assets, such as ESG factors, on financial outcomes. He suggests that the financial benefits of efforts in intangible assets may not be immediate and could be influenced by a range of factors not accounted for in simplistic models, aligning with the notion that governance efforts have intricate impacts on financial performance [11].

The lack of a link, between ESG ratings and ROE raises important questions about the financial significance of ESG factors. This leads to a reevaluation of how different aspects of ESG are valued in terms of company profits and investor gains. It suggests a mismatch between what stakeholders expect and where companies see benefits from ESG efforts. Additionally, it emphasizes the need for selection in ESG initiatives highlighting that not all ESG investments have an impact on financial outcomes.

In general, the author's discoveries add to the conversation about the benefits of ESG investing. While the environmental side of ESG seems to bring results the broader impact of the ESG framework on company size and profitability is intricate and varied. These observations emphasize the importance of research, into how companies can incorporate ESG considerations into their business strategies to meet stakeholder needs and improve financial performance.

5. Conclusion

The study takes place in a context where there is increasing focus, on how companies handle social and governance (ESG) issues and how these practices can impact results. This leads to an exploration of the role ESG factors play in investment decisions and corporate strategies. The main aim is to investigate the connection between ESG ratings and important financial measures like return on assets (ROA) and return on equity (ROE). The hypothesis suggests that higher ESG ratings could lead to better outcomes. By using Squares (OLS) regression analysis on data from the Bloomberg database covering 100 diverse companies in the fiscal year 2022 the study aims to estimate linear regression coefficients efficiently.

The broad sample chosen intentionally captures market scenarios strengthening the reliability and relevance of the results. A careful data selection process involving the removal of outliers and incomplete data ensures quality and dependability. The key insight gained from this research is interesting; while environmental scores exhibit a link with both ROA and ROE social and governance scores do not show a significant relationship with financial performance metrics. This suggests that the connection between ESG factors and financial performance is complex with environmental practices playing a role, in strength.

The study contributes to the existing body of knowledge regarding finance and corporate accountability. It presents real-world proof of the benefits of sustainability underscoring its role in enhancing corporate performance. These results encourage exploration into the interplay among different ESG factors and financial prosperity highlighting a changing ESG environment where a strategic focus, on sustainability, is becoming more crucial.

References

[1] Qureshi M A, Akbar M, Akbar A, et al. Do ESG endeavors assist firms in achieving superior financial performance? A case of 100 best corporate citizens [J]. Sage Open, 2021

[2] Oprean-Stan C, Oncioiu I, Iuga I C, et al. Impact of sustainability reporting and inadequate management of ESG factors on corporate performance and sustainable growth [J]. Sustainability, 2020

[3] Rau P R, Yu T. A survey on ESG: investors, institutions and firms [J]. China Finance Review International, 2024

[4] Sun, Yi. "An Empirical Research of the Relationship Between ESG Performance and Firm Value." Proceedings of the 7th International Conference on Economic Management and Green Development, 2023

[5] Lee, Hoi Hin, and Liu, Mengyuan. "The Impact of ESG Scores on Corporate Performance - A-Share Banks and Securities Firms." SHS Web of Conferences, vol. 163, 02029, 2023

[6] Rossi F, Harjoto M A. Corporate non-financial disclosure, firm value, risk, and agency costs: evidence from Italian listed companies [J]. Review of Managerial Science, 2020

[7] Chan J Y L, Leow S M H, Bea K T, et al. Mitigating the multicollinearity problem and its machine learning approach: a review [J]. Mathematics, 2022

[8] Rashid C A. The efficiency of financial ratios analysis to evaluate company's profitability [J]. Journal of Global Economics and Business, 2021

[9] Valiente J M A, Ayerbe C G, Figueras M S. Social responsibility practices and evaluation of corporate social performance [J]. Journal of Cleaner Production, 2012

[10] Altmann A, Toloşi L, Sander O, et al. Permutation importance: a corrected feature importance measure [J]. Bioinformatics, 2010

[11] Moeller K. Intangible and financial performance causes and effects [J]. Journal of intellectual capital, 2009