AN EXPLORATION OF ESG ACTIVITIES AND FIRM PERFORMANCE OF GLOBAL COMPANIES DURING THE COVID-19 PANDEMIC

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Abstract

This study aims to discern the caliber of environmental, social, and governance (ESG) disclosures and understand their interrelation with corporate financial health during the global health crisis. Employing two-year lagged models and ordinary least squares (OLS) regression, we analyzed firms within the S&P Global 1200 index using data from S&P Capital IQ Pro. The dataset includes ESG discrete scores, composite ESG scores, and additional ESG metrics spanning fiscal years 2018–2019 and their impact on firm performance during fiscal years 2020–2021. Our sample comprises 1200 publicly listed entities from approximately 29 nations, representing over seventy percent of global market capitalization. The analysis reveals a negative correlation between ESG scores and both cumulative raw returns and abnormal stock returns during the pandemic. However, ESG scores are negatively associated with stock volatility and idiosyncratic volatility, indicating reduced risk and greater stability for long-term investors. These findings support the hypothesis that superior ESG performance contributes to stock price stability during crises but may not enhance short-term financial returns. This study underscores the importance of ESG activities in mitigating risks and enhancing resilience, aligning with extant literature. However, our results differ from those of Albuquerque et al. (2020), who found that high environmental and social scores led to higher returns and lower volatility in the first quarter of 2020. In addition, our results also differ from Engelhardt et al. (2021) and Lins et al. (2017), both of whom identified that firms with strong corporate social responsibility (CSR) practices exhibit higher returns and lower volatility, especially during crises.

Keywords: COVID-19, ESG, Sustainability, Corporate Performance, Tobin's Q

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1. INTRODUCTION

The COVID-19 pandemic has ushered in unparalleled challenges for the corporate world. Intriguingly, while many faced adversities, some enterprises reaped benefits during this period (Bapuji et al., 2020; Clark et al., 2021). Some nations bolstered their businesses through financial support, while others refrained, primarily owing to fiscal vulnerabilities (Donthu & Gustafsson, 2020). Amidst these shifts, the manufacturing and finance sectors experienced a deceleration (Nicola et al., 2020), whereas the relevance of electronic communication accelerated (Fukuyama, 2020). A notable observation is that certain industries, including technology, behavioral health, telehealth, groceries, liquor, and fitness equipment, demonstrated resilience, and even thrived during the pandemic (Sharma & Forbes Technology Council, 2020). A report from *The New York Times* (Robbins & Goodman, 2021) highlighted that Pfizer, accumulated $3.5 billion in revenue during the first quarter of 2021, with its COVID-19 vaccine being a primary contributor. However, Pfizer has been reticent about disclosing the profits and distribution metrics of the vaccine, especially concerning less affluent nations.

Research underscores that a pivotal advantage of corporate social responsibility (CSR) is its potential to spur innovation (Bocquet et al., 2017). Yet, the prevailing discourse posits that predominantly well-resourced, large corporations might navigate these tumultuous waters effectively (Fukuyama, 2020). In such a dichotomous environment, where certain businesses and sectors prosper and others falter, a comprehensive examination of global corporations is imperative. This encompasses scrutiny of their environmental, social, and governance (ESG) initiatives, particularly *vis-à-vis* their performance amidst the pandemic. Robust CSR practices, after all, play a crucial role in cementing corporate trust, especially during crises (Lins et al., 2017; Bae et al., 2021). With entities like the Securities and Exchange Commission (SEC) deliberating on the relevance and efficacy of CSR disclosures (Du & Yu, 2021), large corporations find themselves at a crossroads. They are now under the onus to validate their role as responsible corporate entities, making them susceptible to societal norms, ethical debates, political ramifications, and potential adverse societal impacts (Garcia et al., 2017).

The contemporary corporate milieu emphasizes the importance of organizational accountability towards societal and environmental impacts (Henri & Journeault, 2008). Concurrently, ESG disclosures are ascending in prominence (Cucari et al., 2018), and CSR metrics are increasingly integrated into investment strategies (Du & Yu, 2021). The pandemic-induced economic challenges compel businesses to re-evaluate and potentially intensify their CSR initiatives (Fehre & Weber, 2016). This scrutiny is accentuated for large entities, which grapple with public expectations, revenue targets, and societal contributions. There's a possibility for some to reconsider or diminish their CSR focus, redirecting resources elsewhere. Nevertheless, for corporations genuinely invested in fostering societal well-being, the present circumstances present an opportune moment to reinforce ESG commitments. Through this study, we aim to discern the caliber of ESG disclosures and understand their interrelation with corporate financial health during the global health crisis.

Therefore, our primary research question is:

RQ1: Does the ESG performance of S&P 1200 companies correlate with their returns, volatility, and firm value?

Our study diverges significantly from the study conducted by Bae et al. (2021). While they restricted their exploration to the relationship between CSR scores and stock market returns of solely U.S. firms during the COVID-19 market-induced crash (February 18–March 20, 2020) and the subsequent recovery (March 23–June 5, 2020), our scope is more expansive. Instead of a narrow concentration on stock market performance within limited durations, our research probes the connection between these diverse data types and firm performance over a more extended period, specifically fiscal years 2020 and 2021. Additionally, our sample encompasses firms headquartered not only in the U.S. but globally and scrutinizes a broader spectrum of ESG components.

It is noteworthy that large corporations are distributed worldwide with headquarters in diverse locations such as Canada (e.g., Bank of Montreal, TSX: BMO), Germany (e.g., Siemens Energy AG, DB: ENR), China (e.g., Meituan, SEHK: 3690), and Singapore (e.g., DBS Group Holdings Ltd., SGX: D05), to name a few. Garcia et al. (2017) inferred that firms in sensitive industries exhibit commendable environmental performance, even after adjusting for the size of the firm and its domicile country. However, these conclusions were drawn from data spanning 2010–2012. Given the transformative nature of the pandemic, it becomes imperative to scrutinize the ESG disclosures of these significant enterprises, especially as they navigate the heightened intricacies brought about by the pandemic.

Furthermore, the financial magnitude of our sample is immense, comprising 1200 publicly listed entities from roughly 29 nations, which account for over seventy percent of global market capitalization. Thus, our research endeavors to elucidate the ESG performance of these critical firms, which are poised to significantly influence global health and corporate expansion in the coming years.

Our study holds significant merit for several reasons. First, assessing the correlations between diverse ESG metrics and the financial outcomes of these pivotal companies during the pandemic is paramount, given their profound global ramifications. Secondly, extant literature suggests that high-ESG portfolios surpass their low-ESG counterparts, particularly in mitigating financial risks during pandemic-induced economic downturns (Broadstock et al., 2021). Thirdly, there's a lack of empirical evidence asserting that prominent companies, such as Pfizer with its COVID-19 vaccine alleged profiteering, necessarily exhibit subpar ESG performances. Consequently, our research is pertinent as it seeks to bridge this empirical gap, examining the nexus between various ESG components and the performance of major firms during the global health crisis.

The remainder of the paper is organized as follows. The next Section 2 includes

the background/literature review and develops hypotheses. Section 3 explains the methods and analysis, inclusive of supplementary analyses and robustness tests. Results are presented in the Section 4, followed by a discussion in the Section 5. Conclusions, limitations, and suggestions for future research are provided in the last Section 6.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

According to agency theory, a key challenge in corporate governance is aligning the interests of management with those of shareholders (Jensen & Meckling, 1976). ESG performance is increasingly seen as a criterion reflecting responsible and sustainable management practices (Freeman & Reed, 1983). When companies perform well in ESG areas, it signals to shareholders that management is committed to long-term value creation, reducing agency costs associated with short-termism and risk-taking behaviors (Eccles et al., 2014). This alignment can positively influence investor perceptions, potentially leading to higher stock returns (Albuquerque et al., 2020; Margolis & Walsh, 2003).

However, the pandemic forced companies to quickly adapt to changing market conditions, supply chain disruptions, and shifts in consumer behavior. Managers often had to make rapid decisions that could deviate from pre-pandemic strategies or shareholder expectations (He & Harris, 2020). This occasionally led to misalignment between the priorities of agents and principals, especially when decisions impacted short-term profitability for the sake of long-term viability (Mejia, 2021; Zattoni & Pugliese, 2021). Such misalignment could lead to negative outcomes (Grewatsch & Kleindienst, 2017).

ESG performance often reflects how well a company manages long-term risks, including ESG issues (Khan et al., 2016). Effective management of these risks can reduce the likelihood of negative events or scandals that might harm the company's reputation and financial performance (Mejia, 2021). This aspect of risk management is crucial in agency theory, where agents are expected to manage risks effectively on behalf of their principals (Eisenhardt, 1989). Improved risk management associated with strong ESG performance can result in more stable and potentially higher cumulative stock returns (Giese et al., 2019).

Conversely, the pandemic highlighted the importance of managing unforeseen risks during an unprecedented disruption (Kuckertz et al., 2020). The way managers handled risks as perceived by stakeholders significantly influenced firm performance (He & Harris, 2020). Effective management led to better performance, while poor handling exacerbated negative impacts (Hassan et al., 2023). Shareholders expected agents to navigate risks judiciously, balancing short-term challenges with long-term strategic goals (Zattoni & Pugliese, 2021).

ESG performance can also reduce information asymmetry between management and shareholders. High ESG standards often require transparent reporting and accountability practices, providing shareholders with better-quality information about the company's operations and risks (Dhaliwal et al., 2011). This increased transparency can reduce the information gap and uncertainty, a core concern in agency theory (Verrecchia, 2001). With better information, investors might be more confident in the company's prospects, potentially leading to higher stock prices and abnormal returns (Luo & Bhattacharya, 2009).

The pandemic introduced unprecedented uncertainties and risks (Hassan et al., 2023). In response, shareholders demanded more frequent and detailed communication from managers about the company's performance and strategy (Grewatsch & Kleindienst, 2017). This increased need for monitoring and communication strained the agent-principal relationship, as managers faced heightened scrutiny and pressure to perform under challenging circumstances.

Companies with strong ESG performance often enjoy enhanced reputation and trust among stakeholders, including investors, customers, and regulators (Eccles et al., 2014). This trust can reflect reduced agency costs, as stakeholders believe the company is managed in their best interest (Albuquerque et al., 2020; Freeman & Reed, 1983). A strong reputation can translate into investor confidence, potentially increasing demand for the company's stock and leading to higher stock returns (Albuquerque et al., 2020).

Agency theory suggests that when a company demonstrates strong ESG performance, it effectively manages shareholder interests, reduces risks, increases transparency, and enhances its reputation (Jensen & Meckling, 1976). These factors can positively influence the company's stock performance. However, due to the unprecedented nature of the COVID-19 pandemic, we specify non-directional hypotheses, as the direction of the relationship is unpredictable.

H1: The performance in the ESG domains of companies correlates with a) their cumulative stock returns or raw returns, and b) their abnormal stock returns.

Agency theory emphasizes the agent's role in managing and mitigating risks on behalf of the principal (Jensen & Meckling, 1976). Good ESG performance often indicates that a company is effectively managing its ESG risks (Eccles et al., 2014). This effective risk management can reduce overall business risk, which in turn may lower stock volatility (Albuquerque et al., 2020; Giese et al., 2019). Companies that effectively address ESG concerns are likely to face fewer legal, regulatory, and reputational risks, leading to more stable and predictable financial performance.

One of the core concerns in agency theory is the asymmetry of information between managers and shareholders (Eisenhardt, 1989). Companies with strong ESG practices tend to have better transparency and disclosure policies (Dhaliwal et al., 2011). This increased transparency can reduce uncertainty about the company's prospects, as shareholders have a clearer understanding of the company's actions and strategies. Lower uncertainty can lead to lower stock volatility, as the market has a better grasp of the company's intrinsic value and risk profile (Albuquerque et al., 2020; Verrecchia, 2001).

Strong ESG performance can enhance stakeholder confidence and trust in the company's management. This trust is crucial in agency theory,

where agents are expected to act in the best interests of their principals (Freeman & Reed, 1983). Higher stakeholder confidence can lead to more stable investor expectations and behaviors, potentially reducing the volatility of the company's stock. Investors may perceive companies with strong ESG performance as less risky and more sustainable in the long term (Luo & Bhattacharya, 2009).

Idiosyncratic volatility refers to the portion of a stock's volatility that is not explained by market-wide movements and is unique to the individual stock. Strong ESG performance can mitigate firm-specific risks, such as environmental liabilities, social unrest, or governance scandals (Khan et al., 2016). By reducing these risks, a company can decrease its idiosyncratic volatility. This aligns with agency theory's focus on the agent's responsibility to manage company-specific risks effectively (Jensen & Meckling, 1976).

Agency theory supports the idea that better ESG performance, reflecting effective risk management, reduced information asymmetry, and enhanced stakeholder trust, can be associated with lower stock volatility and idiosyncratic volatility. This theoretical framework suggests that when agents (company managers) effectively manage ESG-related aspects, it can lead to more stable stock performance, aligning with the interests of the principals (shareholders) (Eccles et al., 2014).

H2: The performance of companies in ESG aspects is related to a) the volatility of their stock, and b) their idiosyncratic volatility.

Agency theory posits that a key challenge in corporate governance is aligning the interests of agents with those of principals (Jensen & Meckling, 1976). Companies with strong ESG performance are often perceived as being more aligned with the long-term interests of shareholders, as these practices demonstrate a commitment to sustainable and ethical operations (Eccles et al., 2014). This alignment can enhance the company's reputation and stakeholder trust, potentially leading to a higher market valuation as reflected in Tobin's Q (Gompers et al., 2003). Investors may value companies higher if they believe that their long-term interests are being safeguarded through responsible ESG practices.

Effective ESG performance can be seen as a mechanism to reduce agency costs (Freeman & Reed, 1983). These costs arise from conflicts of interest between shareholders and managers and include expenses related to monitoring management's activities (Eisenhardt, 1989). Companies that excel in ESG are likely to have better governance practices, reducing the need for extensive oversight and control mechanisms by shareholders, ultimately leading to a higher Tobin's Q ratio (Margolis & Walsh, 2003).

From the perspective of agency theory, ESG performance can signal to the market a company's commitment to long-term value creation (Healy & Palepu, 2001). Companies that effectively manage their environmental impact, maintain good relationships with stakeholders and have strong governance systems are likely to be more sustainable in the long run. This sustainability can translate into higher firm value, as investors are often willing to pay a premium for companies demonstrating a lower risk profile and a commitment to long-term growth and stability (Luo & Bhattacharya, 2009).

Strong ESG performance indicates effective management of ESG-related risks (Khan et al., 2016). According to agency theory, one of the key responsibilities of managers (agents) is to manage and mitigate risks that could affect shareholders' (principals') investments (Eisenhardt, 1989). By effectively managing these risks, a company can improve its long-term prospects, positively impacting its market valuation and, consequently, its Tobin's Q ratio (Giese et al., 2019).

Agency theory supports the notion that strong ESG performance, indicative of aligned interests, reduced agency costs, effective risk management, and long-term value creation, correlates with higher firm value as measured by Tobin's Q (Eccles et al., 2014). This alignment indicates that companies proactive in ESG matters are likely to be rewarded with higher market valuations relative to their book values (Jensen & Meckling, 1976).

H3: The performance of companies in ESG dimensions correlates with their firm value, as indicated by Tobin's Q (the ratio of market value of equity to book value of equity).

3. RESEARCH METHODOLOGY

We obtain our list of S&P 1200 companies from S&P Capital IQ, along with our financial variables. We obtain our ESG scores from S&P Capital IQ Pro. Table 1 (see Appendix) lists the sources of the data. We use ordinary least squares (OLS) regressions for examining the effect of ESG scores on raw returns, abnormal returns, volatility, idiosyncratic volatility and firm value, i.e., Tobin's Q.

The dataset for this study comprises 1,200 publicly listed companies from approximately 29 countries, representing over 70 percent of global market capitalization. Company financial variables and the list of S&P 1200 firms were obtained from S&P Capital IQ, while ESG scores and additional metrics were sourced from S&P Capital IQ Pro. The dataset includes both discrete and composite ESG scores, spanning fiscal years 2018–2019, with an analysis of their impact on firm performance in fiscal years 2020–2021. To investigate the effect of ESG scores on raw returns, abnormal returns, volatility, idiosyncratic volatility, and firm value (Tobin's Q), we employed OLS regression. The data was tested to ensure it met the assumptions of OLS regression, including linearity, multicollinearity, heteroscedasticity, and normal distribution. All model assumptions were satisfied, confirming the suitability of the dataset for OLS analysis. We performed our statistical analysis in Stata 18.

We started with two years of data for the discrete and composite ESG scores, control variables, industry fixed effects, and country fixed effects variables spanning fiscal years 2018–2019. We then proceeded to calculate our dependent variables, i.e., raw returns, abnormal returns, volatility, idiosyncratic volatility and Tobin's Q for the years 2020 and 2021. When the above two data files were merged in Stata 18, we obtained a dataset of 2314 firm-year observations. Due to missing observations for idiosyncratic volatility (missing 24 observations) and historic volatility (missing 40 observations), we finished with 2292 and 2276 observations respectively.

4. RESEARCH RESULTS

This study examines the relationship between a firm's ESG performance and its financial outcomes, utilizing two-year lagged models and OLS regression. The two-year lag is chosen to comprehensively capture the implications of a firm's ESG activities on its financial performance. Key metrics analyzed include annual stock returns, abnormal returns, volatility, and idiosyncratic volatility.

The model is specified as follows:

$$Stock\ performance/Volatility/Tobin's\ Q_{2020\&2021} = \beta_0 + \beta_1(ESGscore/EnvScore/SocScore/GovScore)_{2018\&2019} + \sum \beta_k FirmControls_{2018\&2019} + \sum \beta_1 IndustryFixedEffects_{2018\&2019} + \sum \beta_m CountryFixedEffects_{2018\&2019} + \varepsilon_i \quad (1)$$

where, i represents the firm, and ε_i denotes the error term. The dependent variable is the *firm's stock performance*, measured by either aggregate raw stock return, or cumulative abnormal stock returns, or stock volatility, or idiosyncratic volatility, or Tobin's Q from January 1, 2020, to December 31, 2021. The primary independent variables include the overall *ESG score* and its components: *environmental score, social score*, and *governance score*.

Firm-level controls include factors such as firm size, return on equity (ROE), profitability, cash holdings, debt ratios, market-to-book ratio, and historical volatility. These controls are consistent with prior research (Hartarska & Nadolnyak, 2007; Roy & Goll, 2014; Cai et al., 2016; Gallego-Alvarez & Ortas, 2017; Drempetic et al., 2020; Engelhardt et al., 2021). Industry-specific fixed effects are based on S&P Capital IQ sector classifications, and standard errors are clustered at the firm level.

4.1. Statistics and correlations

Table 2 (see Appendix) presents the summary statistics for the model variables. ESG scores range from 0 to 100, with average scores lower than medians in each category. The means and medians of raw returns, abnormal returns, volatility, and idiosyncratic volatility are closely aligned. The average firm has approximately USD 9 billion in total assets, with mean and median ROE around 3.8% and 4.7%, respectively. Profitability averages at 7.4% (mean) and 6.2% (median). Cash holdings represent 10.2% (mean) and 7.8% (median) of total assets. Debt ratios are 27.5% (mean), 22.3% (median) for short-term debt, and 21.6% (mean), 19.3% (median) for long-term debt. Table 3 (see Appendix) shows the minimal linear correlation among variables.

4.2. Regression analysis

Table 4a (see Appendix) presents results from the lag model with ESG score as the primary independent variable. Findings indicate that ESG score negatively and significantly impacts stock performance metrics. This contrasts with studies like Cornell (2021) and Shanaev and Ghimire (2022) that found no significant impact, and others like Verheyden et al. (2016) and Giese et al. (2019) which observed positive returns. Consistent with Engelhardt et al. (2021), larger and more profitable firms experience lower volatility and idiosyncratic volatility.

Albuquerque et al. (2020) found that high environmental and social scores led to higher returns and lower volatility in the first quarter of 2020. Similarly, Engelhardt et al. (2021) and Lins et al. (2017) identified that high-CSR firms exhibit higher returns and lower volatility, especially during crises.

Tables 4b, 4c, and 4d (see Appendix) reveal that the ESG scores negatively and significantly impact all dependent variables. This suggests that during the pandemic, firms with higher ESG scores had lower volatility, aligning with findings from Yoo et al. (2021) and Grewatsch and Kleindienst (2017) who noted that strong ESG performance mitigates risk.

Despite the lower raw and abnormal returns associated with higher ESG scores, the reduced volatility and idiosyncratic volatility reflect lower downside risk, safeguarding long-term investors. This stability is likely due to the superior quality of ESG initiatives, which reduces uncertainty and fear. As such, they lead to more stable, predictable investment outcomes. Additionally, reduced fear and uncertainty reflect better management practices, greater stakeholder and shareholder trust, and decreased regulatory and compliance risks. Superior ESG performance minimizes exposure to climate risk and resource scarcity. Further, positive social practices decrease labor disputes. Good governance lowers the likelihood of corporate scandals due to better oversight.

4.3. Tobin's Q analysis

Table 5 (see Appendix) analyzes Tobin's Q as the dependent variable. Tobin's Q represents a firm's market valuation relative to its intrinsic value. The environmental and governance scores do not significantly impact Tobin's Q, while the social score negatively impacts it at the $\alpha = 0.1$ level. This suggests that during 2020 and 2021, social activities might have diminished market value relative to intrinsic value. These findings offer partial support for *H3*, indicating that social performance influences firm value as measured by Tobin's Q during crises.

Our empirical findings align with those of Albuquerque et al. (2020), who reported higher returns and lower volatility for high-ESG firms during the COVID-19 crisis in early 2020. However, our results, which examine ESG activities from 2018 and 2019 with their effects on returns, volatility, and Tobin's Q measured in 2020 and 2021, show lower returns and reduced volatility after a two-year lag. This suggests that the S&P 1200 companies in our sample maintain a more stable valuation with less dramatic shifts over time. Additionally, Albuquerque et al. (2020) found that companies with superior ESG performance and aggressive advertising achieved strong stock performance during the market collapse associated with COVID-19. This highlights advertising as a factor that keeps companies in the public eye, thus emphasizing their ESG performance in the short term, such as within

a single quarter. Our study, however, did not incorporate advertising as a variable. Despite this, both studies identified lower overall and idiosyncratic volatility in high-ESG firms.

Similarly, He and Harris (2020) highlighted the importance of CSR in maintaining trust and stability during the pandemic. They discuss in detail how the pandemic and its associated constraints impacted consumer ethics, corporate marketing philosophy and the performance of ESG activities. However, their views are based on incidents and inferences derived from those. Further, they provide future research questions based on the incidents and the related inferences.

Engelhardt et al. (2021) also found that high ESG ratings correlated with improved stock performance during the COVID-19 crisis, with reduced volatility and idiosyncratic risk, aligning with our findings. While Engelhardt et al. (2021) focused on a short period (February to March 2020) and a European sample, our study encompasses a broader timeframe (2020 and 2021) and provides a more comprehensive view.

Yoo et al. (2021) further confirmed that strong ESG performance mitigates firm-specific risks, consistent with our findings on volatility reduction. They used both ESG and United Nations Global Compact data, covering October 2019 to June 2020, and found that higher environmental scores correlated with both higher returns and volatility, whereas higher Global Compact scores were linked to lower returns and higher volatility.

Lins et al. (2017) demonstrated that high CSR performance led to better financial outcomes during the 2008–2009 financial crisis, supporting the notion that ESG investments foster resilience in times of crisis. Although their study focused on the 2008–2009 financial crisis, our analysis is centered on the COVID-19 period of 2020 and 2021, described as a "black swan event".

Our results indicate that strong ESG performance is significantly associated with lower volatility and idiosyncratic volatility during the COVID-19 pandemic. These findings support *H2* and *H3*, demonstrating that ESG activities enhance stability and reduce risk. While the social score negatively impacts Tobin's Q, the overall evidence suggests that ESG performance plays a crucial role.

5. DISCUSSION OF THE RESULTS

This study investigates the relationship between firms' ESG performance and their financial outcomes during the COVID-19 pandemic. The results provide insights into how ESG performance impacts stock returns, volatility, and firm value as measured by Tobin's Q.

Our findings reveal a negative correlation between composite ESG scores, as well as individual ESG scores, and firms' cumulative raw returns and abnormal stock returns during the pandemic. This contrasts with prior research by Verheyden et al. (2016) and Giese et al. (2019), which found positive returns associated with high ESG performance. However, our results align with Engelhardt et al. (2021), who observed that ESG scores did not significantly impact stock returns during the COVID-19 crisis. The negative association in our study likely reflects the severe and unprecedented challenges posed by the pandemic, which overshadowed the potential benefits of ESG practices in enhancing stock returns.

The analysis indicates a negative correlation between ESG performance and both stock volatility and idiosyncratic volatility. This suggests that superior ESG practices contribute to reduced unpredictability and apprehension in stock prices, providing stability for long-term investors. This finding is consistent with Yoo et al. (2021) and Grewatsch and Kleindienst (2017), who noted that strong ESG performance mitigates firm-specific risks and enhances stability. Additionally, Albuquerque et al. (2020) reported that high ESG scores led to lower volatility during the initial phase of the COVID-19 pandemic, further supporting our results.

Regarding firm value as measured by Tobin's Q, the study finds no significant impact from the composite ESG score, environmental, and governance scores. However, the social score is negatively correlated with Tobin's Q, implying that social activities may have diminished firm value during the pandemic. This partially supports *H3*, indicating that while some aspects of ESG performance may not enhance firm value in crisis periods, social activities might have adverse effects. This finding aligns with the conclusions of Garcia and Orsato (2020), who emphasized the context-dependent nature of ESG impacts on firm value.

Our results are consistent with several key studies summarized earlier. Lins et al. (2017) found that high CSR performance during the 2008–2009 financial crisis led to better financial outcomes, suggesting that ESG investments foster resilience in crises. Similarly, He and Harris (2020) highlighted the importance of CSR in maintaining trust and stability during the COVID-19 pandemic. However, our study diverges from Bae et al. (2021), who found no significant impact of CSR on stock returns during the early months of the pandemic. This discrepancy underscores the complex and multifaceted nature of ESG impacts, which can vary depending on the crisis context and timeframe.

6. CONCLUSION

The negative association between ESG scores and stock returns during the pandemic suggests that, while ESG activities provide stability and reduce risk, they may not necessarily enhance short-term financial performance in extreme crisis conditions. The reduced volatility and idiosyncratic volatility associated with high ESG scores indicate that these firms offer a safer investment during uncertain times, aligning with findings by Albuquerque et al. (2020) and Engelhardt et al. (2021).

In conclusion, this study highlights the importance of ESG performance in contributing to stock price stability and reduced risk during the COVID-19 pandemic. While high ESG scores may not lead to immediate financial gains, they provide long-term benefits by mitigating risks and enhancing resilience. Our study uses the S&P 1200 companies and hence has a size bias. In addition, ESG scores do not perfectly capture the corporate ESG performance of companies and may be susceptible to greenwashing or inaccurate reporting. Future research should explore the impact of ESG

performance across different crisis periods to further understand the dynamics of ESG activities and their implications for firm performance of different sizes. In addition, future studies should explore the geographical and cultural differences in ESG priorities and their impact on the financial performance of companies.

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APPENDIX

Table 1. Sources of data

Data	*Source*
Variables related to the calculation of raw returns	S&P Capital IQ
Variables related to the calculation of abnormal returns	S&P Capital IQ
Variables related to the calculation of volatility	S&P Capital IQ
Variables related to the calculation of idiosyncratic volatility	S&P Capital IQ
Variables related to the calculation of Tobin's Q	S&P Capital IQ
Size	S&P Capital IQ
ROE	S&P Capital IQ
Profitability	S&P Capital IQ
Cash assets	S&P Capital IQ
Short term debt	S&P Capital IQ
Long term debt	S&P Capital IQ
Market-to-book (MTB)	S&P Capital IQ
Negative MTB	S&P Capital IQ
Historic volatility	S&P Capital IQ
Sector	S&P Capital IQ
Headquarters country	S&P Capital IQ
ESG score	S&P Capital IQ Pro
Environmental score	S&P Capital IQ Pro
Social score	S&P Capital IQ Pro
Governance score	S&P Capital IQ Pro

Table 2. Summary statistics

Variables	*N*	*Mean*	*SD*	*Median*	*Min*	*Max*
Raw returns	2316	0.12038	0.27961	0.12568	-1.60492	2.08864
Abnormal returns	2316	23.0793	11.74936	22.5879	-14.35896	97.47469
Volatility	2316	36.97704	17.67333	33.1	0	167.1642
Idiosyncratic volatility	2292	0.02316	0.00720	0.02168	0.00649	0.06629
ESG score	2316	45.34197	22.95846	41	0	92
Environmental score	2316	51.04577	28.52320	51	0	99
Social score	2316	40.28541	25.56650	36	0	96
Governance score	2316	46.19646	20.99962	42	0	89
Size	2312	9.20511	1.26735	9.23886	3.71948	13.23417
ROE	2316	0.03853	0.16171	0.04755	-3.08145	1.03444
Profitability	2314	0.07442	0.07453	0.06151	-0.34489	0.53159
Cash / Assets	2314	0.10247	0.09392	0.07802	0	0.79924
Short-term debt / Assets	2314	0.27539	0.20451	0.22269	0	0.99496
Long-term debt / Assets	2314	0.21637	0.18309	0.19343	0	2.9563
Market-to-book (MTB)	2314	3.15997	45.56582	2.1687	-1478.2865	1123.3189
Negative MTB	2316	0.02418	0.15364	0	0	1
Historic volatility	2276	650.03955	670.81867	518.00192	0	13284.222

Table 3. Pairwise correlations

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*
(1) *Raw returns*	1.00000																
(2) *Abnormal returns*	0.082***	1.00000															
	(0.000)																
(3) *Volatility*	-0.048**	0.691***	1.00000														
	(0.022)	(0.000)															
(4) *Idiosyncratic volatility*	-0.077***	0.536***	0.621***	1.00000													
	(0.000)	(0.000)	(0.000)														
(5) *ESG score*	-0.119***	-0.117***	-0.117***	-0.093***	1.00000												
	(0.000)	(0.000)	(0.000)	(0.000)													
(6) *Environ-mental score*	-0.125***	-0.133***	-0.127***	-0.129***	0.910***	1.00000											
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)												
(7) *Social score*	-0.118***	-0.130***	-0.122***	-0.083***	0.971***	0.858***	1.00000										
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)											
(8) *Governance score*	-0.101***	-0.087***	-0.094***	-0.066***	0.956***	0.793***	0.904***	1.00000									
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)										
(9) *Size*	-0.00600	-0.01800	-0.115***	-0.138***	0.217***	0.292***	0.203***	0.151***	1.00000								
	(0.785)	(0.399)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)									
(10) *ROE*	0.118***	-0.246***	-0.388***	-0.326***	0.071***	0.076***	0.077***	0.056***	0.074***	1.00000							
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.007)	(0.000)								
(11) *Profitability*	0.268***	-0.112***	-0.239***	-0.236***	-0.118***	-0.122***	-0.129***	-0.093***	0.00000	0.248***	1.00000						
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.992)	(0.000)							
(12) *Cash / Assets*	0.125***	0.107***	0.096***	0.087***	-0.116***	-0.089***	-0.107***	-0.143***	-0.119***	-0.038*	0.211***	1.00000					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.071)	(0.000)						
(13) *Short-term debt / Assets*	-0.02900	-0.01400	-0.03300	-0.01300	0.119***	0.157***	0.138***	0.076***	0.070***	0.080***	-0.166***	0.053**	1.00000				
	(0.164)	(0.503)	(0.116)	(0.544)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.010)					
(14) *Long-term debt / Assets*	-0.03200	0.00300	0.044**	0.03200	-0.048**	-0.073***	-0.060***	-0.00400	-0.085***	-0.142***	0.120***	-0.156***	-0.293***	1.00000			
	(0.124)	(0.895)	(0.034)	(0.128)	(0.021)	(0.000)	(0.004)	(0.866)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
(15) *MTB*	0.01200	-0.01700	0.01900	0.00700	0.01400	0.00200	0.01900	0.01500	-0.049**	0.037*	0.041*	0.035*	-0.03100	0.00700	1.00000		
	(0.560)	(0.409)	(0.366)	(0.729)	(0.489)	(0.917)	(0.365)	(0.485)	(0.020)	(0.074)	(0.051)	(0.094)	(0.142)	(0.752)			
(16) *Negative MTB*	0.02500	0.067***	0.063***	0.086***	-0.048**	-0.059***	-0.058***	-0.02100	-0.02800	-0.124***	0.139***	0.060***	0.055***	0.412***	-0.285***	1.00000	
	(0.236)	(0.001)	(0.003)	(0.000)	(0.020)	(0.005)	(0.006)	(0.309)	(0.183)	(0.000)	(0.000)	(0.004)	(0.008)	(0.000)	(0.000)		
(17) *Historic volatility*	0.077***	0.185***	0.209***	0.317***	-0.115***	-0.122***	-0.096***	-0.118***	-0.094***	-0.055***	-0.00200	0.188***	-0.037*	-0.080***	0.01400	0.02600	1.00000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.907)	(0.000)	(0.077)	(0.000)	(0.514)	(0.209)	

*Note: *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 4a. The lag model with *ESG score* as the primary independent variable

Dependent variables	*Raw return*	*Abnormal return*	*Volatility*	*Idiosyncratic volatility*
ESG score	-0.001163***	-0.059801***	-0.060518***	-0.000022**
	(0.000273)	(0.011928)	(0.014108)	(9.000e-06)
Size	0.001974	0.35677	-0.696773**	-0.000423***
	(0.005733)	(0.221512)	(0.283242)	(0.000162)
ROE	-0.160179	10.737473**	11.209083	0.000357
	(0.127119)	(4.845027)	(7.418155)	(0.00395)
Profitability	0.41056***	-5.698486	-29.846342***	-0.018753***
	(0.11087)	(4.016199)	(5.292204)	(0.003128)
Cash / Assets	0.32596***	1.379689	3.964245	-0.001317
	(0.081002)	(3.533635)	(4.617552)	(0.002456)
Short-term debt / Assets	0.016395	0.630791	-1.662944	-0.001751
	(0.034622)	(1.338473)	(1.675538)	(0.00108)
Long-term debt / Assets	-0.039679	-1.693062	2.965829	0.000825
	(0.03639)	(1.682975)	(2.439776)	(0.001261)
MTB	0.000061**	0.006346**	0.007158	2.000e-06
	(0.000029)	(0.002878)	(0.006336)	(4.000e-06)
Negative MTB	0.020897	2.683248	3.180805	0.002459
	(0.045296)	(1.767242)	(4.189314)	(0.001578)
Historic volatility	0.00002	0.002715**	0.004782**	4.000e-06***
	(0.000015)	(0.001181)	(0.001976)	(0)
Sector	0.006864***	-0.084727	-0.583106***	-0.000409***
	(0.002468)	(0.119336)	(0.144129)	(0.000074)
Headquarters country	0.001742***	0.156265***	0.081995***	-0.00002
	(0.000664)	(0.02669)	(0.031454)	(0.000019)
_cons	0.003539	17.041933***	45.397124***	0.030357***
	(0.068038)	(2.792397)	(3.780999)	(0.001786)
Observations	2316	2316	2316	2292
R^2	0.061826	0.076368	0.070633	0.162517

*Note: Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 4b. The lag model with *environmental score* as the primary independent variable

Dependent variables	*Raw return*	*Abnormal return*	*Volatility*	*Idiosyncratic volatility*
Environmental score	-0.001027***	-0.05927***	-0.069383***	-0.000023***
	(0.000221)	(0.009617)	(0.011649)	(7.000e-06)
Size	0.00393	0.508332**	-0.469985	-0.000356**
	(0.005817)	(0.226083)	(0.288167)	(0.000164)
ROE	-0.157671	11.028383**	11.974689	0.000675
	(0.126534)	(4.840687)	(7.421073)	(0.003944)
Profitability	0.408054***	-5.961817	-30.369303***	-0.018885***
	(0.110635)	(3.994568)	(5.27864)	(0.003122)
Cash / Assets	0.340343***	2.08404	4.710578	-0.001028
	(0.081272)	(3.563203)	(4.64242)	(0.002448)
Short-term debt / Assets	0.018048	0.839661	-1.288878	-0.001643
	(0.034305)	(1.347414)	(1.688322)	(0.001078)
Long-term debt / Assets	-0.03869	-1.638797	3.026593	0.000845
	(0.03612)	(1.70807)	(2.470774)	(0.001258)
MTB	0.000061**	0.006413**	0.007314	2.000e-06
	(0.000029)	(0.002786)	(0.006198)	(4.000e-06)
Negative MTB	0.020919	2.688374	3.216219	0.002456
	(0.045603)	(1.76476)	(4.195344)	(0.001575)
Historic volatility	0.00002	0.00268**	0.004716**	4.000e-06***
	(0.000015)	(0.001175)	(0.001966)	(0.00000)
Sector	0.006611***	-0.09272	-0.584608***	-0.00041***
	(0.002476)	(0.119125)	(0.14395)	(0.000073)
Headquarters country	0.001664**	0.149503***	0.071205**	-0.000023
	(0.000667)	(0.026762)	(0.031467)	(0.000019)
_cons	-0.014119	15.980688***	44.091223***	0.02993***
	(0.067724)	(2.784516)	(3.754979)	(0.00179)
Observations	2316	2316	2316	2292
R^2	0.063149	0.080761	0.076253	0.165889

*Note: Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 4c. The lag model with *social score* as the primary independent variable

Dependent variables	*Raw return*	*Abnormal return*	*Volatility*	*Idiosyncratic volatility*
Social score	-0.001019***	-0.057201***	-0.04816***	-0.00002**
	(0.000247)	(0.010601)	(0.012641)	(8.000e-06)
Size	0.001282	0.347039	-0.757712***	-0.000431***
	(0.005755)	(0.221595)	(0.283989)	(0.000161)
ROE	-0.161302	10.80098**	10.983872	0.000346
	(0.127355)	(4.849974)	(7.432989)	(0.003949)
Profitability	0.407339***	-6.000035	-29.936127***	-0.018875***
	(0.111045)	(4.021089)	(5.297089)	(0.00313)
Cash / Assets	0.330766***	1.563734	4.299671	-0.001225
	(0.081063)	(3.536728)	(4.633135)	(0.002454)
Short-term debt / Assets	0.016976	0.74163	-1.719224	-0.001727
	(0.034658)	(1.337311)	(1.676128)	(0.001081)
Long-term debt / Assets	-0.037311	-1.566444	3.093936	0.000875
	(0.036424)	(1.68458)	(2.444341)	(0.00126)
MTB	0.000059**	0.006265**	0.006966	1.000e-06
	(0.000029)	(0.00285)	(0.006314)	(4.000e-06)
Negative MTB	0.018786	2.576255	3.053731	0.002406
	(0.045055)	(1.773098)	(4.20037)	(0.001578)
Historic volatility	0.00002	0.002729**	0.004821**	4.000e-06***
	(0.000015)	(0.001182)	(0.00198)	(0.00000)
Sector	0.006787***	-0.084163	-0.591631***	-0.00041***
	(0.002472)	(0.119251)	(0.14444)	(0.000074)
Headquarters country	0.001625**	0.147985***	0.07811**	-0.000023
	(0.000666)	(0.026961)	(0.031761)	(0.000019)
_cons	0.001076	16.870622***	45.308067***	0.030299***
	(0.068107)	(2.795975)	(3.786252)	(0.001787)
Observations	2316	2316	2316	2292
R^2	0.061488	0.077866	0.069306	0.162535

*Note: Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 4d. The lag model with *governance score* as the primary independent variable

Dependent variables	*Raw return*	*Abnormal return*	*Volatility*	*Idiosyncratic volatility*
Governance score	-0.001022***	-0.049419***	-0.050849***	-0.000017*
	(0.000303)	(0.013295)	(0.015627)	(0.00001)
Size	-0.000301	0.227861	-0.823678***	-0.000473***
	(0.005663)	(0.218856)	(0.280786)	(0.000159)
ROE	-0.168241	10.243981**	10.628117	0.000026
	(0.127761)	(4.823477)	(7.377591)	(0.003952)
Profitability	0.421599***	-5.078788	-29.224016***	-0.018514***
	(0.11093)	(4.016605)	(5.290971)	(0.003129)
Cash / Assets	0.315728***	0.932476	3.45628	-0.001467
	(0.08151)	(3.516366)	(4.593335)	(0.002472)
Short-term debt / Assets	0.010474	0.296051	-1.991809	-0.001886*
	(0.034789)	(1.330409)	(1.667365)	(0.001079)
Long-term debt / Assets	-0.040148	-1.71001	2.938326	0.000822
	(0.036524)	(1.673854)	(2.431193)	(0.001262)
MTB	0.00006**	0.006302**	0.007131	2.000e-06
	(0.000029)	(0.002928)	(0.006404)	(4.000e-06)
Negative MTB	0.020996	2.677549	3.185686	0.002468
	(0.045417)	(1.770027)	(4.17278)	(0.00158)
Historic volatility	0.00002	0.002743**	0.004813**	4.000e-06***
	(0.000015)	(0.001183)	(0.001979)	(0)
Sector	0.006711***	-0.095245	-0.592724***	-0.000414***
	(0.00247)	(0.119679)	(0.144452)	(0.000074)
Headquarters country	0.001974***	0.168558***	0.094349***	-0.000015
	(0.000662)	(0.026312)	(0.031089)	(0.000019)
_cons	0.017531	17.741386***	46.111895***	0.0306***
	(0.068699)	(2.824052)	(3.829473)	(0.00179)
Observations	2316	2316	2316	2292
R^2	0.058893	0.071535	0.068223	0.160201

*Note: Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Table 5. The lag model with *ESG score* as the primary independent variable and *Tobin's Q* as the dependent variable

Dependent variables	***Tobins' Q***	***Tobins' Q***	***Tobins' Q***	***Tobins' Q***
ESG score	-0.001023			
	(0.001408)			
Environmental score		-0.000106		
		(0.001332)		
Social score			-0.00218*	
			(0.00118)	
Governance score				-0.000403
				(0.001452)
Size	-0.240725***	-0.24542***	-0.234702***	-0.244796***
	(0.033185)	(0.033421)	(0.033123)	(0.033232)
ROE	-2.640281***	-2.653778***	-2.645734***	-2.658153***
	(0.563402)	(0.563845)	(0.564677)	(0.563189)
Profitability	9.617777***	9.639547***	9.632844***	9.649857***
	(1.044181)	(1.046566)	(1.047137)	(1.040581)
Cash / Assets	3.042504***	3.056947***	3.036962***	3.049704***
	(0.55448)	(0.557331)	(0.553163)	(0.55709)
Short-term debt / Assets	-0.072044	-0.084234	-0.04124	-0.07964
	(0.183119)	(0.182215)	(0.18283)	(0.183879)
Long-term debt / Assets	-0.100169	-0.099218	-0.096221	-0.099329
	(0.350266)	(0.350738)	(0.348851)	(0.350408)
MTB	0.000985	0.000983	0.000984	0.000982
	(0.000875)	(0.000875)	(0.00087)	(0.000873)
Negative MTB	0.687552*	0.685778*	0.687576*	0.686432*
	(0.362595)	(0.362911)	(0.360539)	(0.36233)
Historic volatility	0.000077	0.000079	0.000076	0.000078
	(0.000064)	(0.000064)	(0.000064)	(0.000064)
Sector	0.012375	0.011539	0.013789	0.011874
	(0.011286)	(0.011367)	(0.011232)	(0.01129)
Headquarters country	0.010714***	0.010983***	0.00995***	0.010962***
	(0.003186)	(0.003211)	(0.003202)	(0.003154)
_cons	3.01543***	3.019865***	2.997317***	3.023921***
	(0.385393)	(0.383671)	(0.384074)	(0.38882)
Observations	2314	2314	2314	2314
R^2	0.455457	0.454443	0.456342	0.454803

*Note: Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.*