# INVESTOR ATTENTION TO ESG AND THE UNDERPERFORMANCE OF HIGH-ESG STOCKS

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**Abstract**

*This paper examines how investor attention affects the relationship between environmental, social, and governance (ESG) scores and stock returns. ESG performance is measured using Refinitiv's combined ESG scores, and return differences between high- and low-ESG portfolios are analyzed. Google Trends data are also used to assess the role of investor attention. It is found that low-ESG stocks exhibit higher return volatility and market beta, resulting in higher returns compared to high-ESG stocks. The performance gap between high- and low-ESG stocks becomes more pronounced following significant events such as the Global Financial Crisis and the COVID-19 pandemic. Increased investor attention to ESG further magnifies the underperformance of high-ESG firms. Additionally, it is demonstrated that the pandemic drew investor attention to ESG, contributing substantially to return differences. Specifically, the return difference between the highest- and lowest-ESG portfolios increases by 6.25 percentage points for every 1% increase in abnormal investor attention following the onset of the pandemic. This study contributes to the literature by emphasizing the role of investor attention in the relationship between ESG scores and stock returns.*

**Keywords:** ESG, investor attention, stock returns, pandemic, COVID-19

**JEL:** G12, Q56

## 1. Introduction

Under the United Nations' 2050 carbon neutrality objectives, advancing green financing requires companies to participate actively in sustainability initiatives. As key economic actors, companies are expected to play a pivotal role in ensuring the long-term sustainability of the global economy by integrating environmental and societal considerations into their operations. The increasing integration of environmental, social, and governance ESG criteria into investors' decision-making emphasizes the importance of understanding the financial implications of ESG performance. Consequently, the literature has extensively examined how ESG performance influences financial outcomes.

Existing studies on the relationship between ESG performance and stock returns present mixed findings. Some demonstrate a positive relationship between the two and often attribute it to improved financial performance (Ghoul *et al*., 2017; Lins *et al*., 2017; Răpan *et al*., 2022). Conversely, others argue that the costs of ESG practices and the market's indifference to their long-term benefits result in negative or insignificant relationships (Brammer *et al*., 2006; Darolles *et al*., 2023; La Torre *et al*., 2020). Despite the increasing interest, studies often overlook the role of investor attention in shaping the impact of ESG performance on stock returns. Investor attention can moderate the financial implications of ESG considerations by influencing market perceptions, risk assessments, and decision-making processes. Increased attention to ESG can also improve information dissemination and highlight the risks associated with low-ESG stocks. That is why understanding how investor attention interacts with ESG performance can better explain the dynamics and outcomes of ESG investing.

Motivated by this gap, we examine the influence of investor attention on the relationship between ESG scores and stock returns. Specifically, we investigate whether increased investor attention affects the return gap between companies with high and low ESG scores. We also contribute to the literature by examining how performance differences evolve during and after major economic events with

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significant shifts in investor attention to ESG. Comparing the performance of ESG stocks over different economic cycles allows us to identify whether specific periods favor ESG investing.

We use Refinitiv's ESG scores to measure ESG performance and Google Trends' Search Volume Index as a proxy for investor attention. Our findings reveal a statistically and economically significant relationship between ESG scores and stock returns. Specifically, we show that firms with low ESG scores outperform high-ESG firms across both equal-weighted and value-weighted portfolios. This return premium is particularly pronounced in periods following economic recessions. We also show that investor attention to ESG is a significant moderator of this relationship. Periods of increased attention to ESG are associated with a wider return gap between high- and low-ESG stocks. Our findings suggest that while ESG investing may appeal to long-term or value-driven investors, it may also lead to lower short-term financial returns during periods when ESG topics are especially important to market participants.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature and develops hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical findings. Finally, Section 5 concludes the study with implications and suggestions for future research.

## 2. Literature Review and Hypotheses Development

There has been an increasing interest in the literature regarding the relationship between ESG performance and stock returns. Yet, the theoretical foundation of the ESG-stock return relationship raises two conflicting hypotheses. On the one hand, ESG performance can positively affect future stock returns. Companies with strong ESG performance can align their practices with broader stakeholder expectations. This alignment can demonstrate accountability and long-term viability, lower transaction costs, reduce default risks, and enhance corporate trustworthiness (Ghoul *et al*., 2017). Moreover, ESG performance can serve as positive signals to mitigate information asymmetry between managers and stakeholders and attract investors who perceive ESG practices as indicators of lower financial risk and long-term stability. Additionally, companies with low ESG performances may face the risk of resource deprivation as these stakeholders might perceive these companies disregard their commitment to sustainable development (Liu *et al*., 2022). Consistent with these dynamics suggesting a positive association between ESG performance and stock returns, some studies highlight the positive market impact of high ESG scores. For example, several studies analyze the value relevance of ESG scores and disclosures and find that they significantly enhance valuations (Răpan *et al*., 2022; Zuraida *et al*., 2016). Similarly, Miralles-Quirós *et al*. (2018) demonstrate that Brazilian companies operating in non-environmentally sensitive industries are rewarded in the market. Ghoul *et al*. (2017) find that socially outperforming companies operating in capital markets with weaker regulations exhibit lower default risks, bear fewer transaction costs, and have higher valuations.

Conversely, ESG performance can also negatively affect future stock returns. In this view, resources allocated to ESG initiatives might incur increased costs and conflict with the goal of maximizing shareholder wealth. High ESG performance can also divert capital from growth opportunities and diminish profitability. If investors prioritize financial fundamentals over ESG considerations, companies with lower ESG scores may achieve higher valuations. Some studies indicate that corporate social performance and societal considerations can reduce market valuations (Brammer *et al*., 2006; Darolles *et al*., 2023; Hong & Kacperczyk, 2009). Brammer *et al*. (2006) find evidence of a negative relationship between corporate social responsibility (CSR) scores and stock returns, suggesting that investors may perceive socially responsible firms as prioritizing non-financial goals over profitability, which could lead to lower market valuations. Similarly, La Torre *et al*. (2020) find that Eurostoxx50 investors do not place considerable value on ESG commitments, suggesting that the market's appreciation of ESG factors is not uniform and may depend on investor priorities and cost considerations.

These conflicting perspectives on the ESG-stock return relationship give rise to the following competing hypotheses:

***H1a:*** *ESG performance positively affects future stock returns.*

***H1b:*** *ESG performance negatively affects future stock returns.*

The relationship between ESG performance and stock returns becomes particularly subtle during periods of economic crisis. For instance, Lins *et al*. (2017) analyze the 2008 financial crisis and find that firms with higher ESG scores exhibited superior profitability and stock returns, likely due to increased investor trust in these firms' long-term stability. Similarly, Broadstock *et al*. (2021) examine the COVID-19 pandemic and reveal the outperformance of portfolios with high ESG scores. ElBannan (2024) also reveals the resilience of sustainable funds during the COVID-19 market crash, suggesting that sustainability investments play a crucial role during periods of crisis. A better ESG performance typically mitigates financial risk with reduced price fluctuations as investors emphasize ESG performance more as an indicator of future stock returns. These findings highlight ESG's potential to act as a stabilizing factor during market turbulence, attracting risk-averse investors. However, the increased demand for high-ESG stocks during crises can drive up their prices and lead to lower expected future returns. As markets stabilize following recessions, investor focus often shifts back to fundamentals such as growth and profitability, which can favor low-ESG stocks. This dynamic results in a widening return difference between high- and low-ESG stocks in the post-recession period, driven by the outperformance of low-ESG portfolios. Accordingly, we hypothesize:

***H2:*** *The return difference between high- and low-ESG stocks widens following recessions.*

The ESG-stock return relationship is further complicated by the limited capacity of investors to process and act on all available information. Traditional asset pricing models assume that investors show sufficient interest in assets to ensure that all publicly available information is instantly reflected in prices (Fama, 1970). However, attention is a finite cognitive resource (Kahneman, 1973), and investors tend to focus selectively on a limited number of stocks based on personal preferences or salient market signals. Over the last decades, as a cognitive constraint, investor attention has appeared as a critical determinant of market dynamics that affects information dissemination. The literature contains a vast amount of work using several indicators to measure investor attention, such as news in the media (Fang & Peress, 2009), abnormal trading volume (Barber & Odean, 2008), advertising expenditure (Grullon *et al*., 2004), analyst coverage (Lin *et al*., 2014), and internet search volume (Da *et al*., 2011). Several studies investigating the impact of the search volume index on stock returns reveal a positive association, indicating that the increase in investor attention increases the predictability of stock returns (Adachi *et al*., 2017; Bank *et al*., 2011; Joseph *et al*., 2011). Studies also suggest that lower levels of investor attention create underreaction to new information (Hirshleifer *et al*., 2009; Loh, 2010).

Despite conflicting views, the literature establishes a foundation for understanding the ESG-stock return relationship, but it often overlooks the role of investor attention as a moderating factor. This gap raises the question of whether shifts in investor attention toward ESG can influence the performance difference between high- and low-ESG stocks. Arguably, investor attention is necessary for information related to ESG performance to be transferred to investors. Without sufficient attention, even the most comprehensive ESG disclosures may fail to influence investment decisions or stock prices. Accordingly, when investors increase their attention to ESG, information about companies' ESG performance can be disseminated more effectively. Thus, investor attention can strengthen the signaling effects of ESG information in reducing information asymmetry and enhancing their market impact. In addition, ESG considerations may become a more significant factor in investors' models and portfolio strategies. These changes, in turn, can strengthen the relationship between ESG performance and stock returns.

***H3:*** *The return difference between high- and low-ESG stocks widens when investor attention to ESG is higher.*

## 3. Data and Methodology

This study examines the relationship between ESG performance and stock returns for firms listed in the S&P 500 index. In particular, we investigate whether investor attention to ESG influences the return differential between high- and low-ESG stocks. The following subsections provide detailed information on the dataset and the empirical models used to test each hypothesis.

### *3.1 Data*

Our sample consists of firms included in the S&P 500 index at any point between 2002 and 2022. To measure ESG performance, we use Refinitiv's combined ESG scores. The environmental component is related to a company's resource use, emissions, and environmental impact; the social component assesses its workforce, human rights, community, and product responsibility; and the governance component evaluates management, shareholders, and corporate social responsibility. The combined ESG scores of Refinitiv provide an overall assessment of a company's environmental, social, and governance performance.

We obtain data on ESG scores, stock data, and financial reporting data from Datastream. To measure investor attention, we use the Google Search Volume Index (GSVI) of the topic "ESG". We construct a monthly Abnormal Search Volume Index (ASVI) following Da *et al*. (2011), to capture deviations from historical attention trends.

The final dataset merges ESG, return, and search volume data into panel and time series structures depending on the model specification.

### 3.2 Predictive Yearly Panel Regressions

We begin by examining whether combined ESG scores are associated with subsequent yearly stock returns. We conduct our analysis annually due to the frequency of our ESG data. We calculate stock returns based on the closing prices at the end of years $t$ and $t-1$ as follows.

$$r_{i,t} = \frac{close_{i,t}}{close_{i,t-1}} - 1 \qquad (1)$$

where $r$ represents yearly stock returns, $close$ represents the closing price at the year-end, and $i$ and $t$ represent stock and year, respectively.

Considering that ESG scores are not stationary, we take the first difference of our combined ESG score and use it as the independent variable in the following model we estimate.

$$r_{i,t} = \alpha + \beta_1 esg_{i,t-1} + \beta_2 lnmv_{i,t-1} + \beta_3 lnbeme_{i,t-1} + \beta_4 r_{i,t-1} + \varepsilon_{i,t} \qquad (2)$$

In this model, the dependent variable is the yearly stock return ($r$) of firm $i$ in year $t$. The independent variable is the firm's combined ESG score ($esg$) in year $t-1$. We use the natural logarithm of market value ($lnmv$), the natural logarithm of book-to-market ratio ($lnbeme$), and the prior year's stock returns as control variables to adjust for possible size, value, and momentum effects. In additional models, we add two more controls to consider the potential relationship of ESG scores with the stock risk. Low ESG scores can be a systematic or unsystematic risk indicator for companies. To separate ESG risk from total or systematic risks, we run the model in Equation (2) by controlling realized volatility and historical beta of year $t-1$, as well. This regression tests Hypotheses 1a and 1b, which represent competing expectations about the effect of ESG scores on future stock returns.

### *3.3 Time Series of Monthly Returns*

Following our investigation of the relationship between ESG scores and subsequent yearly returns, we focus on the return difference between the portfolios of high- and low-ESG stocks. To do this, we first create 10 portfolios using the combined ESG scores. At the beginning of each year, we sort stocks based on their ESG scores and group them into 10 portfolios. In this study, we specifically examine the returns of the lowest and the highest ESG portfolios and the factors affecting the difference between the two. After the portfolio formation, we calculate monthly returns and regress them on the three factors

of the Fama-French (1993) model to see the explanatory power of the model. In addition, we examine the returns of the long-short model to see whether it provides an alpha. The primary model in our monthly time series investigation is as follows:

$$r_t = \alpha + \beta_1 rmrf_t + \beta_2 smb_t + \beta_3 hml_t + \varepsilon_t \quad (3)$$

In Equation (3), the dependent variable is the monthly return of either the high-ESG portfolio, the low-ESG portfolio, or the long-short spread between them. The independent variables are the Fama-French three factors: $rmrf$ represents the difference between the market portfolio and the risk-free rate, *smb* represents return differences between the small and big stocks, and *hml* represents the return difference between the stocks with high and low book-to-market ratios. We obtain data on the factor premiums from the website of Kenneth R. French[1].

To test Hypothesis 2, which states that the return difference between high- and low-ESG stocks widens following recessions, we re-estimate Equation (3) over recession periods identified by the National Bureau of Economic Research (NBER)[2] and the subsequent 12-, 24-, and 36-month post-recession periods.

*3.4 The Role of Investor Attention*

We also examine whether return differences between the high- and low-ESG stocks vary by the level of attention investors allocate to ESG. To do this, we measure ESG attention using GSVI of ESG.

Several investor attention proxies exist in the literature, including internet search volume (Adachi *et al*., 2017; Da *et al*., 2011; Ding & Hou, 2015), abnormal trading volume (Barber & Odean, 2008; Peng *et al*., 2016), analyst coverage (Bali *et al*., 2014; Wu & Shamsuddin, 2014), media coverage (De Souza *et al*., 2018), and firm size (Louis & Sun, 2016). Nevertheless, internet search volume as a measure of investor attention became the most prominent approach following its first use. Thus, we follow the literature and use GSVI to measure investor attention. Instead of relying on a single keyword query, we employ a topic search for ESG, which ensures a broader and more comprehensive coverage of related search terms. This approach mitigates concerns about keyword selection bias, as it captures a range of searches linked to ESG concepts, including synonyms and related terms frequently associated with environmental, social, and governance topics. By using a topic search, we reduce the risk of missing relevant searches due to variations in terminology and ensure that our measure reflects investor attention more accurately.

GSVI does not yield an absolute number of internet searches; instead, it is a normalized and scaled index ranging from 0 to 100. A GSVI score of 0 means that the term has been rarely searched. The literature usually focuses on ASVI to account for time trends and low-frequency seasonality (Da *et al*., 2011). Accordingly, we calculate ASVI as the percent difference between the search volume index (SVI) of the current month and the median of the prior eight months. Thus, our measure of investor attention to ESG is as follows:

$$ASVI_t = \frac{\mathrm{GSVI_t}}{\mathrm{Median}(\mathrm{GSVI_{t-1}}, \ldots, \mathrm{GSVI_{t-8}})} - 1 \quad (4)$$

where $ASVI$ and $GSVI$ represent abnormal search volume index and GSVI of ESG, and $t$ represents month. Using ASVI to measure investor attention, we run the following regression to examine its impact on the return difference between the high- and low-ESG stocks.

$$lmh_t = \alpha + \beta_1 ASVI + \beta_2 rmrf_t + \beta_3 smb_t + \beta_4 hml_t + \varepsilon_t \quad (5)$$

In this model, the dependent variable is the monthly return spread between the low- and high-ESG portfolios ($lmh$) and the main independent variable is abnormal investor attention to ESG ($ASVI$). $rmrf$, $smb$, and $hml$ represent the three factors in Fama and French (1993), and $t$ represents month. To see the impact of the COVID-19 pandemic, we also run this model separately for the period before and after 2020. Equation (5) tests Hypothesis 3, which suggests that the return difference

between high- and low-ESG stocks increases when investor attention to ESG is higher.

## 4. Empirical Findings

Table 1 reports the mean values of key firm characteristics across ESG deciles. Comparing the lowest- and highest-ESG portfolios reveals statistically and economically significant differences. The equal-weighted return of the lowest-ESG portfolio exceeds that of the highest-ESG portfolio by 8.75 percentage points, with a p-value of 0.021, indicating a statistically significant underperformance of high-ESG stocks. The value-weighted return difference, though larger in magnitude at 16.97 percentage points, has a p-value of 0.053, which is slightly above the conventional 5% threshold.

In addition, the lowest-ESG portfolio has significantly lower market value, higher return volatility, and market beta. These factors can contribute to the return difference between the highest- and lowest-ESG portfolios, prompting us to control for these characteristics in our regression models. In contrast, variables such as market-to-book ratio and trading volume show no statistically significant differences between the extreme portfolios, though there are some variations across portfolios.

Overall, the p-values confirm that return and risk characteristics differ meaningfully between high- and low-ESG portfolios. These findings are consistent with Hypothesis 1b, supporting the view that ESG performance is inversely associated with stock returns. Table 2 presents the impact of ESG scores on subsequent yearly returns. The analysis reveals a statistically significant negative relationship between ESG scores and stock returns, even after controlling for market size, book-to-market ratio, and prior year's returns. Specifically, a 10-point increase in ESG scores is associated with a 1.2 percentage points decrease in subsequent returns. Given that the sample standard deviation of ESG scores is 19 points and the average difference between the highest- and lowest-ESG deciles is 54 points, ESG performance has economically significant outcomes. The negative influence of ESG remains significant when we separately account for historical beta and volatility. The negative relationship we observe is consistent with some of the prior studies (Brammer *et al*., 2006; Darolles *et al*., 2023; La Torre *et al*., 2020) and strongly supports Hypothesis 1b, which posits that ESG performance negatively affects future stock returns. The results contradict stakeholder theory's predictions, which argue that high ESG scores should enhance trust and lead to better financial outcomes. In contrast, our findings suggest that investors attach importance to the costs associated with implementing ESG initiatives and prioritize financial fundamentals over ESG considerations.

After demonstrating a negative relationship between ESG scores and subsequent yearly stock returns, we examine the performance of the highest- and lowest-ESG portfolios at the monthly frequency. We begin with a summary of the monthly performance of ESG portfolios. Table 3 shows that average monthly returns tend to decline by ESG scores. Although we do not see a monotonic relationship, the average return of the highest-ESG portfolio is significantly lower than that of the lowest-ESG portfolio. The lowest-ESG portfolio has a 66-basis point higher average monthly return than the highest-ESG portfolio. This finding supports the descriptive statistics in Table 1, which indicates that low-ESG firms are riskier, with higher return volatility and market beta.

In addition to mean and standard deviation, Table 3 includes skewness and kurtosis to capture tail risks and distribution asymmetries across ESG portfolios. The lowest-ESG portfolio exhibits positive skewness and high kurtosis, suggesting a heavier right tail and more frequent extreme positive returns relative to the normal distribution. Conversely, most other portfolios, including the highest-ESG portfolio, show near-zero or negative skewness and moderate kurtosis, indicating more symmetric or left-skewed distributions with fewer large positive outliers. Notably, Portfolio 5 shows extremely high positive skewness and elevated kurtosis, which may be driven by one-off return spikes. Overall, these patterns reinforce the notion that low-ESG stocks offer higher potential upside but come with greater tail risk — consistent with the higher volatility and return premium observed in earlier results.

The differences in average monthly returns create a significant difference between the cumulative returns of the highest- and lowest-ESG portfolios over our sample period. Figure 1 illustrates the cumulative returns. We can observe that high-ESG stocks begin to underperform compared to low-ESG stocks with the onset of the Global Financial Crisis, and this underperformance continues throughout the sample period. However, the COVID-19 pandemic further widens the return gap between the highest- and lowest-ESG portfolios. Consistent with our expectations, Figure 1 shows that the returns of the low-ESG portfolio increase following significant events that emphasize corporate sustainability. This dynamic reflects a shift in market perception, which creates increased investor demand for high-ESG stocks during crises, leading to price increases and compressed future returns. We regress the returns of the highest- and lowest-ESG portfolios on the known risk factors. Table 4 reports the results. The Fama-French 3-factor model explains a large portion of the returns of ESG portfolios. In addition, the long/short portfolio exhibits a significant alpha of 0.6%. We also see that the long/short portfolio correlates positively with the size premium. The results show that known risk factors are insufficient to explain the return difference between the high- and low-ESG stocks.

Overall, our results highlight that ESG scores consistently show an inverse relationship with the returns of S&P 500 stocks. Following the global financial crisis, there has been a notable trend of high-ESG stocks exhibiting lower performance than low-ESG stocks. We also witness a significant expansion in the gap in returns between the highest- and lowest-ESG portfolios with the onset of the COVID-19 pandemic. Hence, our findings do not support the stakeholder theory. Although our findings do not directly conflict with the stakeholder theory, they imply that ESG performance does not yield immediate financial gains for investors. The market may perceive that the costs associated with ESG activities outweigh the immediate financial benefits. The low returns may also be related to the lower risk of high-ESG stocks, owing to the possibly more sustainable firm performance.

To support our observation that return differences between high- and low-ESG portfolios are affected by significant events drawing attention to ESG, we separately examine recessionary periods and the several subsequent years. Table 5 reports the results. Panel A of Table 5 reports the results exclusively for the recessionary periods identified by NBER. Panels B, C, and D report the results for the recession periods and the subsequent 12-month, 24-month, and 36-month periods, respectively. The results show that the alpha we observe in the overall sample period does not exist in recessionary periods. However, it is substantially higher following recessions. The long/short portfolio achieves an alpha of 1.3% one year after recessions, 1% if we include the second year, and 0.7% if we include the third year. As expected, the underperformance of high-ESG firms relative to low-ESG firms increases following recessionary periods and remains high for three years. This finding aligns with Hypothesis 2, which suggests that return differences between high and low-ESG stocks widen in the aftermath of economic downturns. High-ESG firms may attract increased demand during recessions due to their perceived stability and lower risk, resulting in higher valuations and compressed future returns. However, as market conditions recover, investor focus shifts back to fundamentals, such as growth potential and profitability, favoring low-ESG firms.

In addition to periods following recessions when interest in ESG may have increased, we directly investigate whether investor attention to ESG impacts the return difference between the highest- and lowest-ESG portfolios. When investors pay more attention to ESG, they can obtain more ESG-related information, adjust the weight they give to ESG performance in decision-making, or change their risk perceptions based on firms' ESG performance. Figure 1 illustrates GSVI of ESG and the cumulative return difference. We see that, for the most part, investor attention to ESG remained relatively stable until 2019. With the emergence of the pandemic in 2019, the attention to ESG significantly spiked until mid-2023. We also see a high correlation between cumulative returns and the GSVI of ESG after 2019. The correlation coefficient is 38% during

the 2004-2019 period and increases to 66% in the 2019-2024 period.

We examine whether ASVI of ESG is significantly related to the return difference between the highest- and lowest-ESG portfolios. Table 6 shows that investor attention to ESG, measured by *asvi*, is significantly associated with the underperformance of high-ESG firms relative to low-ESG firms. The impact of investor attention on return differences between high- and low-ESG portfolios provides support for our third hypothesis, which expects increased investor attention to strengthen the ESG-stock return relationship. More specifically, a 1% increase in the ASVI of ESG is associated with a 2-point increase in return difference, showing that the underperformance of high-ESG firms worsens with investor attention. As we observe in Figure 1, the GSVI of ESG was relatively stable before 2020. That is why we divide our sample into two, with 2020 as a cutoff, and estimate separate regressions. Doing so also allows us to see the impact of the pandemic on the underperformance of high-ESG firms. Table 6 also reports the results of the subsamples. We see that the impact of investor attention on return differences did not exist before 2020. With significant variations in investor attention to ESG after the pandemic started, we begin to see its considerable influence. More specifically, a 1% increase in investor abnormal attention to ESG is associated with a 6-point higher return difference between the highest- and lowest-ESG portfolios. As investors pay more attention to ESG, the riskiness of low-ESG firms becomes more salient, resulting in more substantial outperformance. High attention may also reinforce investors' concerns about the immediate costs of ESG initiatives. This dynamic aligns with the prior literature, which suggests that increased investor attention can amplify market reactions (Da *et al*., 2011; Hirshleifer *et al*., 2009). The post-2020 period demonstrates the stronger dynamics created by ESG attention and the behavioral aspects of ESG investing.

## 5. Conclusion

This study investigates the association between ESG performance and stock returns, emphasizing the moderating role of investor attention. By analyzing the yearly and monthly returns of companies with varying ESG scores, we demonstrate the dynamics driving return differences between high- and low-ESG stocks. Our findings show an inverse relationship between ESG scores and subsequent stock returns. The portfolio of low-ESG stocks consistently outperforms the portfolio of high-ESG stocks. We show that the low-ESG portfolio exhibits higher return volatility and market beta, contributing to higher returns. This pattern becomes more pronounced following recessionary periods when low-ESG portfolios significantly outperform high-ESG portfolios.

Moreover, investor attention to ESG substantially impacts the return difference between high- and low-ESG portfolios, particularly following the onset of the COVID-19 pandemic. Increased investor attention is associated with a broader return gap, indicating that high-ESG firms may foster long-term stakeholder trust but do not provide immediate financial gains. Our findings suggest that market perceptions and investor behavior, especially during economic recovery, play a crucial role in driving stock returns, with a preference for undervalued, riskier, low-ESG stocks. We contribute to the understanding of the relationship between ESG performance and stock returns by emphasizing the significant role of investor attention and economic dynamics.

Our study contributes to the literature by highlighting how investor attention and macroeconomic conditions interact with ESG performance to influence stock returns. Practically, our findings suggest that investors and portfolio managers should account for the role of investor attention and broader economic cycles when incorporating ESG considerations into investment strategies. Policymakers and corporate managers should also recognize the trade-offs between ESG initiatives and short-term financial performance, particularly in periods of economic recovery. ESG influence should be carefully evaluated in investment decisions, as the benefits of a lower cost of capital for companies may translate to lower returns for investors.

While our study offers novel contributions, it also has certain limitations We focus exclusively on large-cap U.S. firms listed in the S&P 500 index, which may limit the generalizability of the results to smaller firms or other markets with different ESG standards and investor profiles. In addition, our measure of investor attention relies on GSVI data, which may not reflect institutional attention or attention expressed through alternative channels such as social media or professional media platforms. Future research could extend our analysis by including smaller firms, which often operate in less efficient information environments, or by examining firms in other global markets to assess the generalizability of our results. Additional work could also explore alternative measures of investor attention, such as social media activity or corporate media coverage, to better capture variations in public and investor focus on ESG topics. Studies could also investigate how sustained shifts in attention or changes in regulatory environments influence the ESG-stock return relationship over time. Finally, future research could also explore how ESG return dynamics compare across global equity markets by examining cross-market correlations or spillovers, particularly between developed and emerging economies.

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[2] https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions

Table 1: Comparison of Portfolio Characteristics Based on ESG Scores

| | $esg$ | $vw\_ret$ | $ew\_ret$ | $mv$ | $mtbv$ | $tvol$ | $vola$ | $\beta$ |
|---|---|---|---|---|---|---|---|---|
| Lowest | 18.4 | 27.97% | 18.39% | 19,824 | 2.71 | 69.40 | 2.38% | 1.16 |
| 2 | 27.3 | 20.56% | 15.45% | 38,945 | 4.54 | 98.10 | 2.20% | 1.15 |
| 3 | 32.7 | 14.02% | 13.55% | 38,595 | 6.10 | 76.10 | 2.20% | 1.19 |
| 4 | 37.2 | 15.57% | 13.90% | 29,360 | 3.13 | 62.10 | 2.10% | 1.19 |
| 5 | 41.4 | 21.35% | 11.97% | 33,940 | 2.40 | 118.00 | 2.13% | 1.22 |
| 6 | 45.6 | 17.75% | 15.63% | 26,487 | 3.53 | 46.10 | 2.13% | 1.20 |
| 7 | 50.1 | 12.20% | 10.47% | 27,986 | 5.55 | 45.20 | 1.99% | 1.13 |
| 8 | 55.0 | 12.35% | 12.18% | 29,964 | 5.60 | 57.70 | 2.03% | 1.15 |
| 9 | 61.4 | 14.92% | 11.66% | 30,682 | 2.97 | 52.20 | 1.93% | 1.11 |
| Highest | 72.4 | 11.01% | 9.63% | 38,572 | 3.83 | 53.60 | 1.84% | 1.05 |
| L-H | -54.1 | 16.97% | 8.75% | -18,748 | -1.12 | 15.80 | 0.53% | 0.11 |
| p-value | 0.000 | 0.053 | 0.021 | 0.000 | 0.554 | 0.141 | 0.000 | 0.001 |

Mean values of portfolio characteristics. $esg$, $vw\_ret$, and $ew\_ret$ represent ESG scores, value-weighted and equal-weighted yearly returns, respectively. $mv$, $mtbv$, and $tvol$ represent year-end market value, market-to-book ratio, and the total yearly trading volume. Both $mv$ and $tvol$ are expressed in millions. $vola$ and $\beta$ represent the standard deviation of daily returns within a year and historical beta. L-H shows the difference between the lowest and the highest ESG portfolios. P-values show the statistical significance of mean differences.

*Source: Authors' calculations based on data from Datastream.*

Table 2: ESG and Yearly Returns of S&P 500 Stocks

| | $r_t$ | $r_t$ | $r_t$ |
|---|---|---|---|
| $esg_{t-1}$ | -0.0012*** | -0.0012*** | -0.0010*** |
| | (0.0003) | (0.0003) | (0.0003) |
| $\beta_{t-1}$ | | 0.0528*** | |
| | | (0.0177) | |
| $vola_{t-1}$ | | | 8.5119*** |
| | | | (0.9885) |
| $lnmv_{t-1}$ | -0.1995*** | -0.1947*** | -0.1627*** |
| | (0.0212) | (0.0200) | (0.0175) |
| $lnbeme_{t-1}$ | 0.0257** | 0.0219* | 0.0115 |
| | (0.0112) | (0.0112) | (0.0111) |
| $r_{t-1}$ | -0.0664*** | -0.0704*** | -0.0649*** |
| | (0.0124) | (0.0132) | (0.0140) |
| Constant | 2.0566*** | 1.9468*** | 1.5187*** |
| | (0.1984) | (0.1751) | (0.1527) |
| Observations | 11,315 | 11,315 | 11,315 |
| $R^2$ | 0.1014 | 0.1043 | 0.1357 |

The impact of ESG scores ($esg$) on yearly stock returns ($r$). We take the first differences of ESG scores and lag all independent variables by one year. $\beta$ and $vola$ represent historical beta and volatility, calculated as the standard deviation of daily returns within a year. $lnmv$ and $lnbeme$ represent the natural logarithms of market value and book-to-market ratio. *** represents p<0.001, ** represents p<0.05, and * represents p<0.1.

Source: Authors' calculations based on data from Datastream.

Table 3. Descriptive Statistics of Monthly Returns by ESG Decile

| | Mean | St. Dev. | Min. | Max. | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Lowest | 1.56% | 5.22% | -17.23% | 20.50% | 6.78% | 4.84 |
| 2 | 1.44% | 4.99% | -18.59% | 17.35% | -42.14% | 4.10 |
| 3 | 1.16% | 5.11% | -17.01% | 19.50% | -15.03% | 4.40 |
| 4 | 1.15% | 4.82% | -12.78% | 15.96% | -3.25% | 3.76 |
| 5 | 1.39% | 5.48% | -16.71% | 32.21% | 90.34% | 8.57 |
| 6 | 1.32% | 4.83% | -12.98% | 19.49% | 34.02% | 4.53 |
| 7 | 0.97% | 4.25% | -13.53% | 12.71% | -25.76% | 3.64 |
| 8 | 1.00% | 4.70% | -14.41% | 13.22% | -32.43% | 3.78 |
| 9 | 1.19% | 4.52% | -18.78% | 15.04% | -36.20% | 4.44 |
| Highest | 0.90% | 4.56% | -15.67% | 20.58% | -0.44% | 4.58 |

Descriptive statistics of monthly value-weighted returns of 10 portfolios formed on ESG scores. The portfolios are rebalanced yearly at the start of each year.

Source: Authors' calculations based on data from Datastream.

Table 4. Returns of ESG Portfolios and Fama-French 3-Factor Model

| | Panel A: Lowest ESG | Panel B: Highest ESG | Panel C: Low-High |
|---|---|---|---|
| $rmrf$ | 0.0098*** | 0.0097*** | 0.0001 |
| | (0.0004) | (0.0002) | (0.0005) |
| $smb$ | 0.0006 | -0.0015*** | 0.0021** |
| | (0.0007) | (0.0004) | (0.0008) |
| $hmb$ | -0.0010* | 0.0003 | -0.0013* |
| | (0.0006) | (0.0003) | (0.0007) |
| $\alpha$ | 0.0085*** | 0.0023** | 0.0062*** |
| | (0.0017) | (0.0010) | (0.0020) |
| Observations | 264 | 264 | 264 |
| $R^2$ | 0.7232 | 0.8787 | 0.0380 |

The monthly returns of ESG portfolios and the Fama-French 3-factor model. $rmrf$, $smb$, and $hml$ represent market, size, and value factors, respectively. Panel A and Panel B report the results for the lowest and the highest ESG portfolios, respectively. The results for the long/short portfolio results are reported in Panel C. *** represents p<0.001, ** represents p<0.05, and * represents p<0.1.

Source: Authors' calculations based on data from Datastream and Kenneth R. French's Data Library.

Table 5. Return Difference Between Low and High ESG Portfolios Following Recessions

| | Panel A: Recession (Rec.) | Panel B: Rec.+1 Year | Panel C: Rec.+2 Years | Panel D: Rec.+3 Years |
|---|---|---|---|---|
| $rmrf$ | 0.0012 | 0.0017** | 0.0009 | 0.0005 |
| | (0.0012) | (0.0008) | (0.0007) | (0.0006) |
| $smb$ | 0.0050 | 0.0038** | 0.0024* | 0.0023** |
| | (0.0037) | (0.0018) | (0.0014) | (0.0011) |
| $hmb$ | -0.0021 | -0.0025* | -0.0011 | -0.0005 |
| | (0.0017) | (0.0013) | (0.0009) | (0.0008) |
| $\alpha$ | 0.0029 | 0.0113** | 0.0100*** | 0.0069** |
| | (0.0082) | (0.0052) | (0.0037) | (0.0030) |
| Observations | 22 | 57 | 93 | 129 |
| $R^2$ | 0.2166 | 0.1723 | 0.0762 | 0.0512 |

The return difference between the lowest and the highest ESG portfolios and the Fama-French 3-factor model during and following recessions (Rec). In Panel A, the sample only contains months when the US economy experiences a recession. Panels B to D include the following 12 months, 24 months, and 36 months, in addition to recession periods. $rmrf$, $smb$, and $hml$ represent market, size, and value factors, respectively. The dependent variable is the return difference between the lowest ESG portfolio and the highest one. *** represents p<0.001, ** represents p<0.05, and * represents p<0.1.

Source: Authors' calculations based on data from Datastream, Kenneth R. French's Data Library and the NBER.

Table 6. Return Difference Between the Lowest and the Highest ESG Portfolios

| | Panel A: Entire Sample | Panel B: Before 2020 | Panel C: 2020 and after |
|---|---|---|---|
| $asvi$ | 0.0208** | -0.0010 | 0.0625** |
| | (0.0105) | (0.0102) | (0.0297) |
| $rmrf$ | 0.0004 | 0.0002 | 0.0009 |
| | (0.0005) | (0.0005) | (0.0015) |
| $smb$ | 0.0019** | 0.0018** | 0.0024 |
| | (0.0009) | (0.0008) | (0.0028) |
| $hmb$ | -0.0015** | -0.0017** | -0.0013 |
| | (0.0007) | (0.0007) | (0.0017) |
| $\alpha$ | 0.0046** | 0.0067*** | -0.0083 |
| | (0.0023) | (0.0018) | (0.0100) |
| Observations | 239 | 191 | 48 |
| $R^2$ | 0.0542 | 0.0564 | 0.1194 |

Investor attention and the return difference between the lowest and the highest ESG portfolios. Panel A reports the results of the entire sample period. Panel B and Panel C report results separately for before and after the onset of the pandemic. $asvi$ represents the abnormal search volume index (ASVI) and measures investor attention. $mrf$, $smb$, and $hml$ represent market, size, and value factors, respectively. The dependent variable is the return difference between the lowest ESG portfolio and the highest one. *** represents p<0.001, ** represents p<0.05, and * represents p<0.1.

Source: Authors' calculations based on data from Datastream, Kenneth R. French's Data Library, and Google Trends.

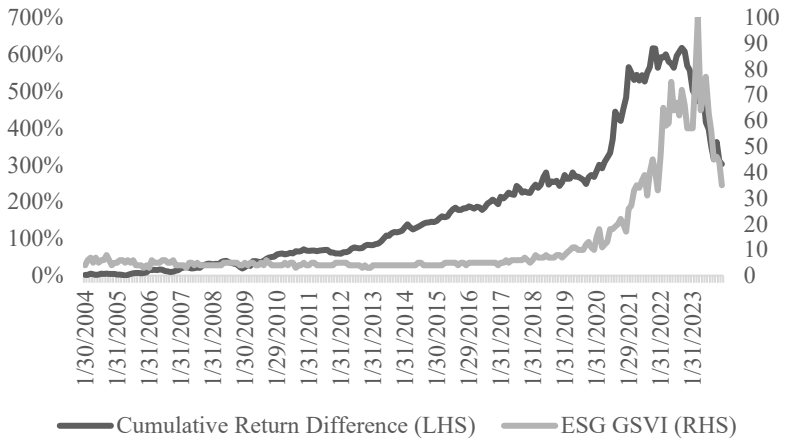


Figure 1. Cumulative returns of the lowest and the highest ESG portfolios
*Source: Authors' calculations based on data from Datastream and Google Trends.*

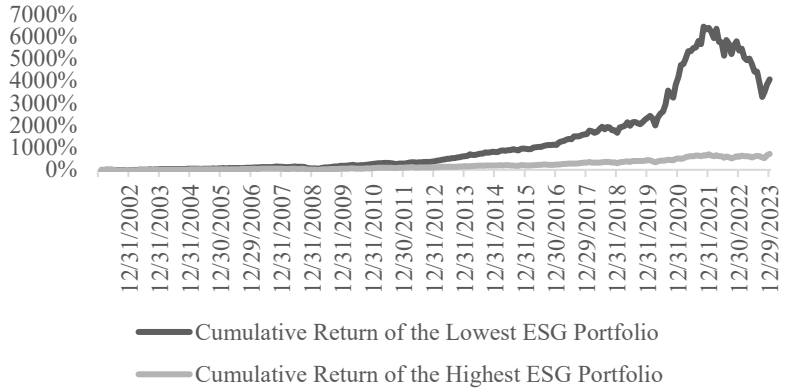


Figure 2. Cumulative return difference and investor attention to ESG

Cumulative monthly return difference between the lowest and the highest ESG portfolios and the Google Search Volume Index (GSVI) of ESG. The cumulative return difference is displayed on the left-hand side, and the GSVI on the right-hand side.

Source: Authors' calculations based on data from Datastream.