sustainability

MDPI

Article

Does Company Information Environment Affect ESG–Financial Performance Relationship? Evidence from European Markets

Oğuzhan Bahadır * and Sergen Akarsu

Department of Business Administration, Galatasaray University, Istanbul 34349, Türkiye; sakarsu@gsu.edu.tr
* Correspondence: obahadir@gsu.edu.tr; Tel.: +90-212-227-4480

Abstract: This study investigates the relationship between ESG and financial performance and explores the influence of firms' information environment on this relationship. To do this, we construct an information environment index from several proxy measures, evaluate ESG performance using Refinitiv's ESG scores, and evaluate financial performance using return on assets and Tobin's Q. We find that the information environment index has a positive relationship with both return on assets and Tobin's Q ratio. On the contrary, ESG has a negative association with return on assets but a statistically insignificant relationship with Tobin's Q. The negative relationship of ESG with return on assets is convex and weaker in companies with better information environments. We also show that in firms with high asset turnover ratios, ESG does not harm profitability. Separately examining the ESG components reveals that each similarly relates to profitability but that governance has a less negative impact. Our study reveals non-linearities in the relationship between ESG and financial performance that can help companies set better targets and implement better practices about ESG. The moderating effect of the information environment reveals the importance of information dissemination in preventing ESG practices from creating unfavorable consequences. This study may shed light on a more effective ESG policy by showing ways to reduce the adverse financial effects of ESG practices.

Keywords: information environment; ESG; financial performance; profitability; firm value

Citation: Bahadır, O.; Akarsu, S. Does Company Information Environment Affect ESG–Financial Performance Relationship? Evidence from European Markets. *Sustainability* **2024**, *16*, 2701. https://doi.org/10.3390/su16072701

Received: 21 February 2024
Revised: 20 March 2024
Accepted: 22 March 2024
Published: 25 March 2024

1. Introduction

In recent years, corporate sustainability and environmental, social, and corporate governance (ESG) performance have attracted significant attention from consumers and investors. Companies increasingly embrace this issue in response to the growing emphasis on their economic environment. They have started integrating sustainability into their operations by issuing annual sustainability reports, signaling more about ESG performances, and creating new roles such as "Director of Sustainability" [1]. Ref. [2] shows that 99% of CEOs believe sustainability is essential to their prospects, and 48% have started implementing sustainability practices.

The increasing emphasis on sustainability and ESG performance has made it more important to investigate how these components affect investments and company performance. Previous studies extensively examined issues related to sustainability and ESG, such as socially responsible investments [3–5], green finance [6–8], impact investing [9,10], and the effects on firm value [11–13].

This study primarily focuses on how ESG performance is related to financial performance, specifically profitability and firm value. There are two possible ways that ESG performance can be linked to a firm's financial performance. First, the stakeholder theory argues that a firm is surrounded by many groups or individuals that affect or are affected by the firm's operations. Therefore, the stakeholders are directly connected to firm performance, and firms that align their interests with their stakeholders' interests achieve more sustainable success [14]. Some studies consider ESG as a performance measure of a firm's

commitment to stakeholder interests [15–17]. Thus, the stakeholder perspective expects a positive relationship between ESG performance and financial performance. Consistent with this view, many studies find that better ESG performance is associated with higher profitability and firm value [18–20].

On the other hand, the second view focuses more on the costs incurred to have a better ESG performance, such as reporting, compliance, and training costs. The value-destroying view argues that with increasing emphasis on ESG, companies forgo profitability and focus heavily on pleasing stakeholders, reducing their performance. The literature also provides evidence supporting this view, as some studies find that firms with better ESG performance have lower profitability and value [21,22].

We see that existing studies provide evidence in favor of both theories. The mixed and contradictory results of previous studies indicate that the relationship of ESG with financial performance is still controversial. Studies show that the ESG–financial performance relationship can be different in different countries or regions. Differences in sample periods and methodologies can lead to contradictory results in the ESG literature. Considering the ongoing controversy, it is still important to investigate the ESG–financial performance relationship and the role of possible moderating factors that can enhance our knowledge on the matter.

Our most significant contribution to the literature is investigating how a firm's information environment can affect the relationship between ESG performance and financial performance. A company's information environment includes all value-relevant information about the company and all system components that process, use, and disseminate that information [23,24]. Examining the role of the information environment is critical as ESG performance is an essential piece of information in companies' information environment. For several reasons, firms' information environment may be important in the relationship between ESG performance and financial performance. First, the information environment can create an internal effect and enable companies to manage internal ESG performance better. Effective communication and reporting can enable more efficient implementation and monitoring of ESG-related activities, which may reduce extra costs as companies improve their ESG performance. Secondly, the information environment can create an external impact because companies communicate their commitments to better ESG performance through information environments. Thus, a more transparent information environment would convey a firm's ESG practices more effectively to the external world. Moreover, transparency in the information environment can also facilitate the integration of ESG considerations into investment decisions. In other words, for ESG performance to affect profitability and firm value, stakeholders must acquire and properly process ESG information. Accordingly, the relationship between ESG performance and financial performance will be more positive in companies with a better information environment. A few studies in the literature investigate the moderating effect of various factors that can be associated with firms' information environment. For instance, several studies [25–27] examine the moderating effect of ESG disclosures and integrated reporting, which can improve companies' information environment by facilitating the dissemination of ESG information. Ref. [28] shows that firm size strengthens the positive effect of ESG disclosures, ref. [29] shows that ESG performance has a more pronounced impact on the financial performance of firms with greater media attention, and ref. [30] finds that ESG's impact on firm value becomes more substantial with higher ESG disclosure quality. However, to the best of our knowledge, no studies directly examine the moderating effect of the information environment in a comprehensive way. In this study, we fill this gap and contribute to the literature by providing evidence on the moderating role of firms' information environment on the relationship of ESG with financial performance.

Our contribution to the literature is important because focusing on only one aspect of the information environment, as in previous studies, cannot sufficiently capture its multidimensional nature. Although studies show the importance of ESG disclosures, integrated reporting, firm size, and media attention, they cannot provide sufficient information

about the role of the overall information environment because it is a broad concept that requires a comprehensive investigation. For one thing, publishing integrated reports does not necessarily mean that firms' information environment becomes more transparent. For instance, ref. [31] argues that lengthy integrated reports with complex language and boilerplate statements harm company information environments instead of improving them. Ref. [32] finds that voluntarily publishing integrated reports does not improve analysts' earnings forecast accuracy. Studies show that content, readability, quality, and third-party verification are crucial in increasing the credibility of integrated reports and enhancing the firms' information environments [30,33,34].

Furthermore, studies in the literature have suggested many proxy variables to measure companies' information environments. An extensive literature review conducted by [35] revealed that 37 different proxy measures of information environment exist. Although most of these proxy measures can theoretically be associated with firms' information environment, they can also reflect other important company characteristics. For example, firm size is associated with a better information environment [24,36] but also with higher leverage [37], lower stock returns [38,39], lower firm growth [40], and more significant innovation activity [41]. That is why choosing and using one of many alternative proxy variables can lead to measurement problems. A detailed examination centered on the information environment would be beneficial, especially considering the difficulty in its measurement. Our most prominent contribution to the literature in this study is on this matter. We develop a comprehensive index that can measure the information environment of companies by covering its various dimensions. Creating such an index allows for a holistic and thorough assessment of a firm's complex information environment. That is why the index we construct is essential in understanding the information environment's role in the relationship between ESG and financial performance. Additionally, it provides a consistent framework and can enable better comparison of different companies.

To complete the objectives of this study, we focus on European companies. In Europe, many countries have strong ESG regulations, encouragements, and disclosure requirements, which makes European companies ideal for examining the impact of their information environment and ESG performance on financial performance. In addition to considering combined ESG performance, we examine companies' environmental, social, and governance performances separately to see the individual effects of ESG components. Our sample covers firms in the STOXX Europe 600 index, and the sampling period is from 2002, the earliest year Refinitiv's ESG data are available, to 2022. The STOXX Europe 600 index has existed since 1998 and includes large-cap, mid-cap, and small-cap companies. The index highly represents the European stock market by covering 90% of the free-float market capitalization. We use the first principal component of trading volume, market size, bid–ask spread, the number of analysts, and the dispersion in analyst forecasts to measure the information environment. We focus on two dimensions of financial performance: profitability and firm value. We measure these dimensions with return on assets and Tobin's Q to be in line with previous work in the literature.

Our results show a negative relationship between ESG performance and profitability. This relationship is robust in controlling the information environment, leverage, historic beta, cost of debt, and one-year-lagged value of return on assets. The negative relationship also exists separately for all three components of ESG. The effect sizes are similar, though the governance component has the most minor negative impact on return on assets. Unlike ESG performance, a firm's information environment is positively associated with profitability. We also find that the negative association between ESG performance and profitability turns positive after ESG scores reach a certain level. We further show that the negative relationship is weaker in firms with a better information environment. When we examine the details of the low profitability of companies with better ESG performance, we see that these companies have lower capital expenditures (CAPEX) to assets ratios and higher gross margins but also lower asset turnover ratios. The central factor in the low profitability of high ESG firms is the reduced efficiency in using their assets to generate revenue. We

divide firms into terciles according to their asset turnover ratios and do not find a significant negative association between ESG performance and return on assets in firms with high asset turnovers. Furthermore, although there is a negative relationship between the level of ESG performance and profitability, we observe a positive relationship between the growth in ESG performance and profitability. We also find that this positive relationship is more substantial in companies with better information environments.

On the other hand, we observe a statistically insignificant relationship between ESG performance and firm value in most models, unlike the ESG performance and profitability relationship. The lack of statistical significance also exists separately for the ESG components. Nevertheless, when we include a quadratic term in our model, we find a negative association between governance performance and firm value that turns positive after a certain level of governance performance. We also show that firms with better information environments have higher firm value, but the information environment does not moderate the relationship between ESG performance and firm value. The growth in ESG performance is also statistically insignificant for the firm value.

The results of our study highlight the importance of a transparent information environment in better financial performance and in reducing the negative impact of ESG performance on profitability. Our findings imply that better communication, information dissemination, and higher operational efficiency prevent ESG from negatively impacting profitability to the detriment of shareholders.

We structure the remainder of this paper as follows: In Section 2, we provide a literature review. Section 3 describes how we construct the information environment index and explains our methodology. In Section 4, we present our empirical findings, and in Section 5, we conclude our study.

2. Literature Review and Hypotheses Development

Our study contributes to two strands of the literature. The first is the extensive literature examining the relationship between ESG performance and financial performance, which provides mixed and contradictory results. Stakeholder theory posits that firms with better ESG performance commit more to stakeholder interests, creating an alignment between the firm and stakeholders' interests. Thanks to this alignment, stakeholder theory expects better ESG performance to lead to more sustainable success. On the other hand, the value-destroying view argues that sustaining a better ESG performance induces extra costs due to reporting, monitoring, and compliance efforts, making ESG activities harmful to firm performance to the detriment of shareholder value. Both theories have some empirical support in the literature. Nevertheless, studies that find a positive relationship in line with stakeholder theory are more prevalent. Combining the findings of about 2200 individual studies, ref. [42] showed that 90% of studies find a nonnegative impact of ESG performance on financial performance. Similarly, in their investigation of 132 studies from top-tier journals, ref. [43] revealed that 78% of publications report a positive effect of sustainability practices on financial performance. The literature also shows that some variables, such as firm size, disclosure volunteerism, integrated reporting, and ownership structure, affect this relationship [25,27,44,45].

Several studies have examined the impact of ESG components, separately or in combination, on the financial performance of organizations [11]. Ref. [20] covers a sample of listed German companies and investigates ESG performance's impact on accounting-based and market-based financial performance variables. His findings reveal that the combined ESG score and all three components separately have a favorable effect on return on assets (ROA), the accounting-based financial performance measure. Moreover, the governance score has the most substantial impact on financial performance compared to environmental and social scores. According to [20], the long tradition of corporate governance reporting in Germany or the increased value relevance for the stakeholders may explain this finding. However, the results of [20] show no significant impact of ESG performance on Tobin's Q, the market-based financial performance measure. Like [20], ref. [18] also investigates the

impact of each ESG component on return on assets and Tobin's Q. Their sample covers the largest 1720 firms from 39 countries between 2013 and 2021. They also find that the combined ESG score and each ESG component are positively associated with return on assets. They also find a positive relationship between ESG performance and Tobin's Q, except for the individual environmental performance. They conclude that the time necessary for environment-related actions to produce results for firms may cause the lack of a significant effect of environmental performance on Tobin's Q. To identify whether ESG activities affect the financial performance of European public enterprises, ref. [19] used a combined approach of machine learning techniques and an inferential model. Their results indicate a positive relationship between ESG practices and financial indicators, such as ROA and return on equity (ROE). The positive association is more evident when companies invest in environmental innovation, employment productivity, diversity, and equal-opportunity policies. Based on a sample of 4887 global companies, ref. [46] examine the effects of ESG activities on firms' market-based and accounting-based performance. They provide evidence that ESG activities and corporate governance practices benefit firm performance. Moreover, they show that the market negatively values antitakeover mechanisms and positively values pollution control activities.

Several studies demonstrate a negative or insignificant association in contrast to stakeholder theory. In their examination of UK firms, ref. [47] found no significant difference in the risk-adjusted performance of companies with high and low CSP ratings. They conclude that implementing an ESG strategy in UK firms does not create significant financial costs or benefits regarding risk or return. Ref. [21] analyzed whether a firm's ESG activities significantly promote its market value, stock holdings by institutional investors, and future operating performance, as measured by ROA. They find no evidence that firms recover these expenditures through increased sales. They also find that an expansion of ESG policies is associated with future stock underperformance and a long-run deterioration in ROA, suggesting that any benefits to stakeholders from social responsibility come at the direct expense of firm value. In their study of Italian-listed companies from 2007 to 2015, ref. [48] found a statistically insignificant relationship between ESG and abnormal returns.

As can be seen, existing studies in the literature tend to directly examine the effect of ESG performance on firm value in different periods and for various countries. Nonetheless, several studies have also investigated the role of moderating variables that may affect the relationship between ESG performance and financial performance. The most salient of these moderating factors include the disclosure and reporting of ESG performance. For instance, ref. [27] examines the role of ESG reporting on how ESG performance is valued. They find that both stand-alone and integrated reporting increases the favorable valuations of ESG performance. In addition, they find that the moderating effect of integrated reporting is higher than that of stand-alone reporting. Similarly, ref. [25] examines the impact of integrated reporting on the relationship between ESG disclosures and firm performance. They find a positive relationship between ESG disclosures and financial performance before and after the introduction of integrated reporting. They also find that voluntarily publishing integrated reporting results in better firm performance. On the contrary, ref. [32] finds that the value of companies that voluntarily publish integrated reports does not significantly vary from that of other companies. Ref. [33] examines how the content of integrated reporting affects ESG's influence on financial performance. They find that the readability of integrated reports increases market valuations. Ref. [26] finds that ESG disclosures mitigate the adverse impact of ESG weaknesses. Ref. [30] finds that the effect of ESG performance on firm value becomes more substantial with higher ESG disclosure quality.

In addition to ESG reporting and disclosures, the literature also studies the influence of several firm and industry characteristics. Ref. [49] finds that the positive effect of ESG performance on firm performance is more pronounced in companies with higher CEO power. Ref. [50] finds that employees on the board of directors create a negative relationship between ESG performance and firm value. Ref. [44] finds that firm size moderates the positive relationship between ESG performance and financial performance. Similarly,

ref. [28] shows that firm size strengthens the positive effect of ESG disclosures on the value of firms in the airline industry. Ref. [45] examines the influence of ownership structure on the relationship between ESG performance and the value of Chinese manufacturing firms. They find that executive and institutional ownership improves the positive effect of ESG performance on firm value. Ref. [29] shows that ESG performance has a more pronounced impact on the financial performance of firms with greater media attention. They argue that ESG performance disclosures attract the attention of ESG investors, strengthening the impact of ESG performance. Ref. [51] finds that ESG disclosures improve firm value, especially for companies in environmentally sensitive industries. On the contrary, ref. [12] finds that the value-creating effect of ESG activities is more prominent for firms that do not belong to environmentally sensitive industries. Ref. [52] finds that ESG performance increases firm value in the Korean market, and this increase is more substantial in sectors with a lower concentration and higher growth rates.

The current state of the literature shows that both stakeholder theory and the value-destroying view have empirical support, making them valid in explaining the relationship between ESG and financial performance. Thus, the first research question of this study has two possible answers. If stakeholder theory is correct, we should be able to see a positive association between ESG and financial performance. If, on the other hand, the value-destroying view is correct, there should be a negative association between ESG and financial performance.

In addition to the ESG literature, our study will contribute to the information environment literature by examining how it affects value relevance. Various studies have previously discussed how firms' information environment affects their values and reporting behavior. For instance, ref. [53] shows that a better information environment decreases the propensity for and profitability of insider trading. Ref. [54] finds that audits of US private companies not required to be audited make the information environment more transparent and reduce their cost of debts. Ref. [55] finds that a better information environment is associated with higher stock price informativeness.

Some studies investigate how the information environment affects the market reactions to CSR and sustainability activities. Ref. [56] examines the impact of voluntary CSR disclosures on stock returns. They find that stocks earn abnormal returns following CSR disclosures, and this effect is more substantial for firms in a limited public information environment. Ref. [57] examines the relationship between CSR disclosures and the value of cash holdings. They find that stand-alone CSR reports positively affect the value of cash holdings, and the information environment negatively moderates this effect. Ref. [58] examines stock market reactions to sustainability reports. They find that the market significantly reacts positively to the release of sustainability reports, and this reaction is more pronounced for firms in a weaker information environment. Ref. [59] argues that integrated reports can improve the information environment and moderate the relationship between CSR activities and firm value. He finds that the moderating effect of integrated reporting varies by the level of expenditures. Specifically, integrated reporting has a positive moderating effect for firms with lower or higher environmental expenditures but a negative moderating effect for firms in the middle group. Ref. [60] examines the impact of ESG disclosures on stock liquidity. They find that ESG disclosure mandates increase stock liquidity, and this effect is more substantial for firms with poorer information environments.

Some studies examine how cross-listings affect the information environment and market valuations. Ref. [61] explores the information environment of non-US firms cross-listed in the United States. They find that cross-listing improves firms' information environment by increasing analyst coverage and forecast accuracy. They also find that in line with the improvements in the information environment, non-US firms cross-listed in the United States have higher valuations. Similarly, ref. [62] also investigates cross-listings in the US and finds that cross-listed companies' cost of capital experiences a decrease of up to 120 basis points. Ref. [63] examines the signaling behavior of companies cross-listed in the US with dividend increases. They suggest that cross-listed firms with poorer information

environments have a higher incentive to use dividend increases as a signaling mechanism. They find that for these firms, dividend increases follow a reduction in systematic risk. Ref. [64] examines the decision of firms already cross-listed in the UK to cross-list their shares in the US. They find that this decision may have been motivated by increasing price informativeness. They find that cross-listing in the US improves firm performance, even though they were already cross-listed in the UK.

The literature also shows that the information environment affects earnings management and value relevance. Ref. [65] examines the moderating effect of the information environment on the relationship between institutional stock ownership and accrual management. They find that institutional ownership is negatively associated with accrual management, especially in firms with poor information environments. Ref. [66] shows that when a country's information environment is less opaque, the value relevance of earnings and earnings quality exhibit a higher degree of positive association. Ref. [67] examines dual-class firms and finds they are associated with a weaker information environment and increased earnings management. Ref. [68] investigates the impact of the changing information environment on earnings quality and earnings transparency as China's accounting standards converge to IFRS. They find that the new accounting standards improved earnings transparency, which decreased audit fees.

We argue that a more transparent information environment reduces the information asymmetry between the firm and stakeholders. Thus, the effect of ESG performance on financial performance should be more positive for firms with a more transparent and accessible information environment. There are two potential channels for this moderating impact. The first is internal and originates from within the organization. Several studies show that a better information environment and internal communication improve operational functioning and the efficacy of sustainability strategies. For instance, ref. [69] argues that transparency is essential to improving sustainability performance. They also suggest that lowering information asymmetry within the organization can provide effective resource allocation for sustainability initiatives. Ref. [70] finds that internal communication and transparency positively influence employee engagement and improve performance. Ref. [71] shows that organizational commitment is increasing in employee perceptions of corporate social responsibility and argues that internal communication can be used to influence employee attitudes.

The second channel operates through how external stakeholders access and process information. A transparent information environment can help to reduce doubt and give stakeholders the knowledge they need to assess and comprehend the company's ESG initiatives properly. On the other hand, unclear information might obscure otherwise encouraging indicators of good ESG performance and weaken the impact of ESG on financial performance. Information asymmetry also makes decision-making processes riskier. High information asymmetry can make it difficult for stakeholders to obtain timely and accurate information about a company's ESG policies, which raises uncertainty. Due to uncertainties over associated risks, investors, for example, may be reluctant to allocate capital to companies that provide partial or imprecise ESG disclosures. Companies that successfully handle information asymmetry by providing clear, accessible, and reliable information about their ESG initiatives may be better positioned to mitigate perceived risks. This, in turn, could positively influence stakeholders' decisions and, ultimately, corporate profitability.

Considering the internal channels, we expect the information environment to have a positive relationship with financial performance. We also anticipate that it will moderate the relationship between ESG and financial performance. More specifically, we expect the impact of ESG on financial performance to be more favorable for firms with better information environments. Thus, the primary hypotheses of the study are as follows:

Hypothesis 1. *The firm information environment is positively associated with financial performance.*

Hypothesis 2. *The relationship between ESG and financial performance is more positive in firms with better information environments.*

3. Materials and Methods

In this study, we investigate how ESG performance affects the value and profitability of European firms. In addition, we construct an index to proxy firms' information environment and examine its moderating effect. The sample in this study includes the largest companies in the European stock markets. To create the sample, we first determine all stocks that were ever included in the STOXX Europe 600 index between 2002 and 2022. After identifying the companies in the index, we exclude the ones that do not have at least ten observations of combined ESG scores or do not have data on the variables used in the study. After this elimination, 707 companies remain in the sample.

We use yearly ESG scores from Datastream as the primary independent variable. Datastream provides standardized ESG scores using publicly available information, such as company websites, annual reports, and corporate social responsibility reports. These scores are calculated separately for the environment, social, and governance components, and a combined ESG score is also provided. We primarily investigate the effect of combined ESG scores, but we also examine the impact of each component separately. The availability of yearly ESG scores in Datastream determines our sampling period.

Table 1 presents information about the variables we use in this study. We also provide further details in the following subsections.

Table 1. Variables used in the study.

Dependent Variables	**Calculation**
Return on Assets (roa_t)	$= \frac{earnings_t}{(assets_t + assets_{t-1})}$
Tobin's Q ($tobin_t$)	$= \frac{mcap_t + prefstock_t + liabilities_t}{assets_t}$
Independent Variables	Calculation
Combined ESG Score (esg_t)	Obtained from Datastream (TRESGCS).
Environmental Score (env_t)	Obtained from Datastream (ENSCORE).
Social Score (soc_t)	Obtained from Datastream (SOSCORE).
Governance Score (gov_t)	Obtained from Datastream (CGSCORE).
Information Environment (ie_t)	The first principal component of trading volume, market size, bid–ask spread, the number of analysts, and the dispersion in analyst forecasts.
Control Variables	Calculation
Leverage ($lever_t$)	$= \frac{debt_t}{assets_t}$
Historic Beta ($beta_t$)	Obtained from Datastream. (897E)
Cost of Debt (k_d)	$= \frac{interest_t}{debt_t}$

Notes: This table reports the calculations and abbreviations of the variables we used in this study. We obtain some of the variables directly from Datastream. Datastream symbols for these variables are shown in parentheses. All the data we use to calculate other variables are also from Datastream. *earnings* represents earnings available to shareholders, *assets* represents book value of total assets, *mcap* represents market value of equity, *prefstock* represents preferred stock, *liabilities* represents the book value of total liabilities, *debt* represents the book value of total debt, *interest* represents interest expenses, and t represents time.

3.1. Information Environment Index

Many different proxy variables have been proposed in the literature to measure firms' information environment. In their literature review, ref. [35] divided these proxy variables into four categories: "analysts and analysis data", "stock-related data", "firm characteristics", and "country characteristics".

The most frequently used proxies are the number of analysts [72–74], analyst accuracy [67,75,76], analyst dispersion [77,78], trading volume [79,80], bid–ask spread [81,82], institutional ownership [36,72], and market size [24,36]. Though frequently used, these

measures are imperfect proxies for firms' information environment as they can be associated with many other firm characteristics. While creating their investor sentiment index, ref. [83] argued that creating an index from many imperfect sentiment proxies would be a better approach than choosing one among them. From a similar point of view, we create an index in this study using several information environment measures that are frequently used in the literature. These variables are trading volume, market size, bid–ask spread, the number of analysts, and the dispersion in analyst forecasts. These variables allow us to capture the categories frequently used in the literature, set out in [35], such as analysts and analysis data, stock-related data, and firm characteristics.

In the literature, analyst coverage is associated with improved information dissemination [72,84], while transaction volume and firm size are associated with higher stock visibility [85,86]. On the other hand, the literature associates bid–ask spread with information asymmetry [87–89] and analyst dispersion with disagreement among investors [90,91]. Therefore, we expect the number of analysts, trading volume, and market size to impact the information environment index we construct positively. In contrast, we expect the bid–ask spread and analyst dispersion to have a negative impact.

We obtain data on trading volume, market size, bid and ask prices, the number of analysts, and the dispersion in analyst forecasts from Datastream. We calculate relative bid–ask spreads by dividing the difference between ask and bid prices by their average values. The number of analysts represents the number of earnings per share (EPS) estimates for the next financial year. The analyst dispersion is the standard deviation of EPS estimates. Market size represents the number of ordinary shares multiplied by the latest closing price. To calculate a yearly information environment index, we average the daily trading volume, daily bid–ask spread, and monthly analyst dispersion within a year. For the number of analysts and market cap, we consider the middle of the year and use the values at the beginning of July. The variables we use are often associated with other firm characteristics as well as with the information environment. Therefore, we can expect these variables to have components unrelated to firms' information environment. We use principal component analysis to separate the common component associated with firms' information environment. We estimate the first principal component of these five variables and obtain the following index:

$$ie = 0.5930 lnva + 0.5834\, lnmcap - 0.2886 spread + 0.4739 num\_analyst - 0.0096 analyst\_disp \quad (1)$$

where *ie* is the information environment index, *lnva* is the natural logarithm of trading volume, *lnmcap* is the natural logarithm of market size, *spread* is relative bid–ask spread, *num_analyst* is the number of analysts, and *analyst_disp* is the dispersion in analyst forecasts.

We see that the index is in line with our expectations. First, the first principal component explains 49% of the sample variation. Second, we can see that all variables enter the equation with expected signs. That is why we consider the index suitable as an information environment measure.

3.2. Other Variables and Research Models

In this study, we focus on two variables that are frequently used in the literature as dependent variables. We use Tobin's Q to measure firm value and return on assets for company profitability [18–20,92]. An advantage of this setting is that these two dependent variables enable both market-based and accounting-based analyses.

We primarily examine how the levels of combined ESG scores are associated with Tobin's Q and return on assets. In addition, we calculate the year-over-year growth in ESG scores and study their association with firm value and profitability. We also include our information environment index as an explanatory variable to see its impact. We control for variables frequently used in previous studies examining the relationship between ESG performance and financial performance, such as leverage, beta, and cost of

debt [18,20,46,92]. We also control for the one-year lagged values of the dependent variable to control for possible lagged effects. Thus, the primary models of our study are as follows:

$$roa_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 roa_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

$$tobin_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 tobin_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

where *roa* represents return on assets, *tobin* represents Tobin's Q, *esg* represents combined ESG scores, *lever* represents leverage, *beta* represents historic beta, k_d represents the cost of debt, and *i* and *t* represent firm and year, respectively.

We also run additional models that will allow us to see the relationship between ESG performance and financial performance in more detail. For instance, several studies in the literature find a quadratic relationship between ESG performance and financial performance [93,94]. To test for the possible non-linear association, we also include the squared values of ESG scores on the right-hand side of the equation. Additionally, the literature suggests that variables associated with firms' information environment can moderate the effect of ESG performance on financial performance [25–27]. To test this moderating effect, we create an interaction term between ESG scores and the information environment index and use it as an explanatory variable. Thus, we run the following models:

$$roa_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 roa_{i,t-1} + \beta_7 esg^2_{i,t} + \varepsilon_{i,t} \quad (4)$$

$$roa_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 roa_{i,t-1} + \beta_7 esg_{i,t} \times ie_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$tobin_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 tobin_{i,t-1} + \beta_7 esg^2_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$tobin_{i,t} = \alpha + \beta_1 esg_{i,t} + \beta_2 ie_{i,t} + \beta_3 lever_{i,t} + \beta_4 beta_{i,t} + \beta_5 k_{d_{i,t}} + \beta_6 tobin_{i,t-1} + \beta_7 esg_{i,t} \times ie_{i,t} + \varepsilon_{i,t} \quad (7)$$

We estimate the models using panel regressions with fixed effects estimator to control for unobserved heterogeneity. The results of Hausman's specification test also confirm our choice. In addition, we use heteroskedasticity-consistent standard errors.

4. Results and Discussions

Before examining the relationship of ESG performance with profitability and firm value, we report the descriptive statistics of the variables we used in this study in Table 2. We see that the mean *roa* is 5%, and the Q ratio is greater than 1, with a value of 1.36. A Q ratio greater than 1 indicates that the market values companies more than the value of their recorded assets, implying that they are overvalued (1.36). The ESG component with the highest mean value is the social component, whereas the environmental component has the highest standard deviation. The average debt ratio is 26%, and the cost of debt is 7%. The sample includes stocks with negative beta.

Table 2. Descriptive statistics.

	Observations	Mean	St. Dev	Min.	Max.
roa	10,168	0.05	0.11	−2.05	2.69
tobin	9726	1.36	2.36	0.01	73.56
esg	10,168	54.30	18.62	0.63	95.65
env	10,168	56.97	26.28	0.00	99.14
soc	10,168	59.66	23.27	0.43	98.47
gov	10,168	55.95	22.43	0.80	99.04
ie	10,168	0.05	1.55	−16.25	5.09
lever	10,168	0.26	0.19	0.00	4.75
beta	10,153	1.06	0.54	−0.73	4.97
k_d	9777	0.07	0.54	0.00	27.02

Notes: This table reports the descriptive statistics of the variables used in this study. *roa* is return on assets and *tobin* is Tobin's Q ratio. *esg* represents combined ESG scores and *env*, *soc*, and *gov* represent the scores for its components, namely *environmental* score, social score, and governance score. *ie*, *lever*, *beta*, and k_d represent information environment index, leverage, historic beta, and cost of debt, respectively.

We also examine how the mean values of these variables vary according to the ESG scores. To do this, we sort stocks based on their combined ESG scores each year and divide them into quintiles. We then calculate the mean values of various characteristics for each ESG quintile. Table 3 reports the results. We can see that the average return on assets increases from the lowest ESG quintile to the second one but monotonically decreases from there to the highest ESG quintile. Nonetheless, the difference between the returns on assets of the lowest ESG quintile and the highest one is not statistically significant at conventional levels. Unlike return on assets, there is no noticeable pattern in mean Tobin's Q ratio. We see a similar overvaluation for each ESG quintile as we see in the sample mean. The average Q ratio of each quintile is greater than 1. The smallest mean belongs to the third quintile, with 1.2784, and the largest value belongs to the second quintile, with 1.41. In addition, the difference between the Q ratio of the highest ESG quintile and that of the lowest is statistically insignificant.

Table 3. Mean values of variables by ESG quintiles.

	Low	**2**	**3**	**4**	**High**	**Diff.**
roa	0.0517	0.0554	0.0510	0.0487	0.0474	−0.0042
tobin	1.3961	1.4112	1.2784	1.3681	1.3314	−0.0647
ie	−0.7242	−0.3052	−0.0467	0.3920	0.8620	1.5863 ***
lever	0.2579	0.2397	0.2557	0.2767	0.2825	0.0247 ***
beta	1.0052	1.0804	1.0735	1.0637	1.0403	0.0351 *
k_d	0.0737	0.0695	0.1002	0.0626	0.0470	−0.0266 **

Notes: We sort stock into quintiles each year based on their ESG scores. This table reports the mean values of the variables used in this study for these ESG quintiles. The last column, "Diff." shows the difference between the highest ESG quintile and the lowest one. *roa* represents return on assets, *tobin* represents Tobin's Q ratio, and *ie*, *lever*, *beta*, and k_d represent information environment index, leverage, historic beta, and cost of debt, respectively. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Furthermore, the information environment index monotonically increases from the lowest ESG quintile to the highest. Although the lowest ESG quintile has the lowest historic beta, we see a decrease from the second quintile to the highest. Interestingly, the highest ESG quintile has the highest debt ratio but also the lowest cost of debt. It appears that firms with high ESG scores tend to have better information environments and use higher leverage, but they also benefit from the lower cost of debt compared to firms with low ESG scores.

4.1. The Level of ESG Performance

We begin by testing the contemporaneous association of ESG scores with return on assets and Tobin's Q ratio. Table 4 reports the results without the control variables, and Table 5 reports them with all the control variables included.

Panel A in both Tables 4 and 5 shows that all three components of ESG individually have a negative relationship with profitability. In addition, we see that the environmental and social components have similar effect sizes, but the governance component has a relatively smaller impact than the other two. The combined ESG score is also negatively associated with return on assets. The negative association between ESG scores and return on assets is robust in controlling for the information environment, leverage, historic beta, cost of debt, and the lagged value of return on assets. These results are in contrast with those of previous similar studies, such as [18,20], which find that ESG performance has a positive impact on profitability and that the governance score is the component with the strongest impact. We think the most important thing that can cause this difference is sample differences. For instance, compared to [20], we have a sample of stocks from more countries and examine a more extended period. When we limit our sample to German stocks like [20], we obtain a positive association between combined ESG scores and return on assets (for the sake of brevity, we do not report results we obtained from this subsample, but the results are available upon request). The results show that the relationship between

ESG performance and profitability may be different in different countries and regions. Our findings show a negative relationship between ESG performance and profitability in the European region, although some countries in the region exhibit a positive relationship.

Table 4. The relationship of ESG with profitability and firm value without control variables.

	Panel A: *roa*				**Panel B: *tobin***			
env	−0.0003 ***				−0.0002			
	(0.00006)				(0.0007)			
soc		−0.0003 ***				0.0002		
		(0.00007)				(0.001)		
gov			−0.0002 **				0.0007	
			(0.00008)				(0.0007)	
esg				−0.0003 ***				0.0006
				(0.0001)				(0.001)
Cons.	0.0664 ***	0.0683 ***	0.0594 ***	0.0649 ***	1.326 ***	1.30 ***	1.280 ***	1.286 ***
	(0.0033)	(0.0042)	(0.0045)	(0.0047)	(0.040)	(0.049)	(0.037)	(0.051)
Obs.	12,352	12,352	12,354	12,355	11,971	11,971	11,977	11,979
R^2	0.005	0.004	0.001	0.003	0.000	0.000	0.000	0.000

Notes: This table reports the results of the relationship of ESG with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. We separately estimate the model for each ESG component and the combined ESG score. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. The sampling period is from 2002 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05.

Table 5. The relationship of ESG with profitability and firm value with control variables.

	Panel A: *roa*				**Panel B: *tobin***			
env	−0.0004 ***				0.000			
	(0.0001)				(0.000)			
soc		−0.0004 ***				−0.000		
		(0.0001)				(0.001)		
gov			−0.0002 ***				0.000	
			(0.0001)				(0.000)	
esg				−0.0004 ***				−0.000
				(0.0001)				(0.001)
ie	0.0146 ***	0.0143 ***	0.0132 ***	0.0141 ***	0.0331 **	0.03 ***	0.033 **	0.034 ***
	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0129)	(0.012)	(0.013)	(0.012)
lever	−0.126 ***	−0.127 ***	−0.126 ***	−0.127 ***	−0.0115	−0.011	−0.013	−0.011
	(0.027)	(0.027)	(0.027)	(0.027)	(0.0508)	(0.051)	(0.051)	(0.051)
beta	−0.0002	−0.0005	−0.0008	−0.0004	−0.0148	−0.015	−0.015	−0.014
	(0.0024)	(0.0024)	(0.0024)	(0.0024)	(0.0320)	(0.032)	(0.032)	(0.033)
k_d	−0.00214	−0.00220	−0.00197	−0.00207	−0.0135	−0.014	−0.014	−0.014
	(0.00196)	(0.00203)	(0.00198)	(0.00199)	(0.0141)	(0.014)	(0.014)	(0.014)
dep_{t-1}	0.28 ***	0.28 ***	0.29 ***	0.28 ***	0.69 ***	0.69 ***	0.69 ***	0.69 ***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)
Cons.	0.09 ***	0.09 ***	0.08 ***	0.09 ***	0.45 ***	0.45 ***	0.44 ***	0.46 ***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.08)	(0.07)	(0.07)	(0.05)
Obs.	9760	9760	9761	9761	9226	9226	9229	9229
R^2	0.178	0.177	0.172	0.175	0.456	0.456	0.456	0.456

Notes: This table reports the estimation results of Equations (2) and (3), which examine the relationship of ESG with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. We separately estimate the model for each ESG component and the combined ESG score. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable (dep_{t-1}). The sampling period is from 2002 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05.

Nonetheless, like [20], we cannot detect a statistically significant relationship between ESG performance and Tobin's Q ratio at conventional levels. We observe statistically insignificant results for each ESG component separately and for the combined ESG score. Panel B in Tables 4 and 5 shows that control variables do not affect the significance of the relationship between ESG performance and Tobin's Q, as none of the ESG coefficients are statistically significant with or without control variables. Recall that the mean Q ratio of the whole sample and each ESG quintile is greater than 1. The overvaluation appears to persist despite a low ESG performance and prevents us from seeing a significant relationship between ESG and firm value. We see that ESG does not play any role in the market's valuation of companies, and even companies with poor ESG scores are overvalued on average. On the other hand, we see that overvaluation does not increase with better ESG performance, and the market values companies with excellent and bad ESG performance similarly. These results imply that the market thinks that ESG performance will not directly impact firm performance in the future. However, in Table 5, we see that, contrary to ESG performance, the information environment index (*ie*) is positively associated with both profitability and firm value. The coefficient of *ie* is positive and statistically significant in each model we estimate. The results suggest that better information dissemination and smaller information asymmetry are valued positively by the market. Overall, our results strongly reject the stakeholder theory, which expects ESG to be positively associated with financial performance. In terms of profitability, we provide evidence for the value-destroying view and show the negative association of ESG with profitability. On the other hand, in terms of market valuation, we do not find statistically significant results for either stakeholder theory or the value-destroying view. Furthermore, our results are in line with Hypothesis 1 of the study for both aspects of financial performance. We show that the information environment index is positively associated with profitability as well as Tobin's Q ratio, which is consistent with our argument that a better information environment provides higher operational efficiency and reduced information asymmetry.

We take a closer look at the expenditure and sales volumes of companies with high ESG scores to better see where their low profitability stems from. To do this, we calculate the capital expenditures (CAPEX) to assets ratio, cost of goods sold (COGS) to sales ratio, operating expenditures (OPEX) to sales ratio, and sales to assets ratio of each company and use them as dependent variables. Again, we look for the association of ESG components separately and for combined ESG performance. The results are reported in Table 6. To save space, we only report the coefficients of the ESG components and the combined ESG score. The control variables are the same as in the previous models.

Table 6. Details of profitability.

	Dependent Variable			
	CAPEX/Assets	**COGS/Sales**	**OPEX/Sales**	**Sales/Assets**
env	−0.0281 ***	−0.00054 *	0.0140	−0.00086 ***
	(0.0067)	(0.00031)	(0.0156)	(0.00018)
soc	−0.0266 ***	−0.00015	0.0009	−0.00114 ***
	(0.0056)	(0.00031)	(0.0070)	(0.00021)
gov	−0.0128 ***	−0.00049 **	−0.0826	−0.00049 ***
	(0.0028)	(0.00022)	(0.0822)	(0.00014)
esg	−0.0268 ***	−0.00044 ***	−0.0503	−0.00099 ***
	(0.0064)	(0.00017)	(0.0509)	(0.00021)

Notes: We examine the details of profitability to better see where the lower profitability of companies with high ESG scores comes from. More specifically, we examine the relationship of ESG performance with capital expenditures (CAPEX) to assets ratio, cost of goods sold (COGS) to sales ratio, operating expenditures (OPEX) to sales ratio, and sales to assets ratio. For each dependent variable, we estimate four different modes. The control variables are the information environment index, leverage ratio, historic beta, cost of debt, and the one-year lagged value of the dependent variable. To save space, we only report the coefficients of the ESG components and the combined ESG score. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. The sampling period is from 2002 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Table 6 illustrates that the ESG performance is inversely related to CAPEX/assets, cogs/sales, and sales/assets ratios. This negative association is statistically significant in each model, except for the one with the social score as the independent variable and the cogs/sales ratio as the dependent variable. We also see that ESG performance is not significantly related to operating expenses. The results suggest that although companies with better ESG performance have lower returns on assets, the decreased profitability does not come from increased expenses. On the contrary, companies with better ESG performance have lower capital expenditures and higher gross margins. Their lower asset turnover ratios seem to give them lower returns on assets. The companies with good ESG performance have lower sales performance relative to their asset size and have lower returns on assets due to this inefficiency.

To take a closer look at the role of asset turnover in the relationship between ESG performance and profitability, we divide companies into terciles based on their asset turnover ratios and estimate Equation (2) for each tercile. The results are reported in Table 7. We see that similar to the primary model, each ESG component and the combined ESG score are negatively associated with return on assets for the low and medium asset turnover terciles. However, for the high asset turnover tercile, we see different results. Table 7 shows that governance scores and the combined ESG scores do not have any statistically significant association with return on assets. The results imply that if companies have good asset efficiency in generating revenue, the adverse effects of governance and combined ESG scores on profitability disappear. Nevertheless, environmental and social components individually have a significantly negative association with return on assets for each asset turnover tercile.

Table 7. ESG Performance and Profitability for each Asset Turnover Tercile.

	Asset Turnover Tercile		
	Low	**Medium**	**High**
env	−0.00035 ***	−0.00035 ***	−0.00031 ***
	(0.00010)	(0.00008)	(0.00009)
soc	−0.00037 ***	−0.00032 ***	−0.00025 **
	(0.00011)	(0.00009)	(0.00010)
gov	−0.00027 **	−0.00012 *	−0.00002
	(0.00011)	(0.00007)	(0.00013)
esg	−0.00038 ***	−0.00025 ***	−0.00018
	(0.00013)	(0.00008)	(0.00013)

Notes: We divide stocks into terciles according to their asset turnover ratios and separately estimate Equation (2) for each tercile. This table reports the estimation results of four different models for each asset turnover tercile. The dependent variable is return on assets. The control variables are the information environment index, leverage ratio, historic beta, cost of debt, and the one-year lagged value of return on assets. To save space, we only report the coefficients of the ESG components and the combined ESG score. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. The sampling period is from 2002 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Considering the findings in the literature that suggest the relationship of ESG performance with profitability and firm value may be non-linear [93,94], we also include quadratic terms in our models. Table 8 reports the estimation results of Equations (4) and (6), which examine the quadratic relationship of ESG with profitability and firm value. As with the primary model, the scores of the individual ESG components and the combined ESG score have a negative relationship with the return on assets in the models with the quadratic term. While the quadratic term is not statistically significant when we consider the ESG components separately, it is statistically significant for the combined ESG score. The results suggest that the negative association between the combined ESG score and return on assets turns positive with higher ESG scores. We calculate the turning point of the combined ESG score and find that it is 77.40. The turning point is higher than the sample mean of the

combined ESG score, 51.93, suggesting that ESG performance is detrimental to profitability unless a firm has an outstanding ESG performance.

Table 8. The quadratic relationship of ESG with profitability and firm value.

	Panel A: *roa*				**Panel B: *tobin***			
env	−0.0006 ***				−0.0024 *			
	(0.0002)				(0.0014)			
soc		−0.0007 ***				−0.003		
		(0.0002)				(0.002)		
gov			−0.0005 **				−0.004 **	
			(0.0002)				(0.002)	
esg				−0.0011 ***				−0.003
				(0.0003)				(0.003)
quadratic	0.0000	0.00000	0.00000	0.00001 ***	0.0000	0.0000	0.00004 **	0.000
	(0.0000)	(0.00000)	(0.00000)	(0.00000)	(0.0000)	(0.0000)	(0.00002)	(0.000)
ie	0.015 ***	0.014 ***	0.013 ***	0.014 ***	0.033 ***	0.034 ***	0.034 ***	0.04 ***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.013)	(0.014)	(0.013)	(0.01)
lever	−0.126 ***	−0.128 ***	−0.127 ***	−0.128 ***	−0.010	−0.013	−0.018	−0.01
	(0.027)	(0.027)	(0.027)	(0.027)	(0.052)	(0.051)	(0.051)	(0.05)
beta	−0.000	−0.001	−0.001	−0.000	−0.015	−0.015	−0.015	−0.01
	(0.002)	(0.002)	(0.002)	(0.002)	(0.032)	(0.033)	(0.032)	(0.03)
k_d	−0.002	−0.002	−0.002	−0.002	−0.013	−0.013	−0.014	−0.01
	(0.002)	(0.002)	(0.002)	(0.002)	(0.014)	(0.014)	(0.014)	(0.01)
$dependent_{t-1}$	0.279 ***	0.280 ***	0.288 ***	0.282 ***	0.686 ***	0.686 ***	0.687 ***	0.69 ***
	(0.0505)	(0.0506)	(0.0499)	(0.0509)	(0.0239)	(0.0240)	(0.0238)	(0.02)
R^2	0.178	0.177	0.172	0.176	0.456	0.456	0.456	0.456

Notes: This table reports the estimation results of Equations (4) and (6), which examine the quadratic relationship of ESG with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. We separately estimate the model for each ESG component and the combined ESG score. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. *quadratic* represents the squared term of either one of the ESG components or the combined ESG score. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable ($dependent_{t-1}$). The sampling period is from 2002 to 2022. To save space, the coefficient of the constant term is not reported. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Though we obtain similar results in the quadratic model for return on assets, we observe several differences in the results for Tobin's Q ratio. First, the association of the environmental and governance scores with Tobin's Q becomes statistically significant at the 0.1 level. While the effects of both components are negative, the governance components have a stronger negative effect. When we look at the coefficients of the quadratic term, we see that they are statistically significant only in the model where the governance score is the independent variable. In other words, the additional environmental score does not reduce the negative impact on Tobin's Q, but each additional governance score increases the slope. The turning point of the governance score is 50.30, which is less than the sample mean of 54.64. Table 8 shows that for stakeholder theory to be valid, firms must have very high ESG scores. Only then does the alignment of firms' interests with those of stakeholders provide additional benefits. Unless firms achieve a very high level of ESG scores, the value-destroying view dominates, and ESG activities harm financial performance.

We also test whether a firm's information environment moderates the relationship between ESG performance, profitability, and firm value. To do this, we create an interaction term between the information environment index and each ESG component and include this term in the models. The results are reported in Table 9.

Table 9. The interaction between ESG and the information environment.

	Panel A: *roa*				**Panel B: *tobin***			
env	−0.0004 ***				−0.0000			
	(0.0001)				(0.0004)			
soc		−0.0004 ***				−0.0001		
		(0.0001)				(0.0005)		
gov			−0.0002 ***				0.0002	
			(0.0001)				(0.0004)	
esg				−0.0004 ***				−0.000
				(0.0001)				(0.001)
interact.	0.0000	0.0000	0.0001 *	0.0001 *	−0.0003	−0.0003	0.0001	−0.000
	(0.00004)	(0.00005)	(0.00004)	(0.00005)	(0.0003)	(0.0004)	(0.0002)	(0.001)
ie	0.0136 ***	0.0126 ***	0.0092 ***	0.0100 ***	0.0455 *	0.0510 **	0.0304	0.054 *
	(0.0034)	(0.0034)	(0.0031)	(0.0033)	(0.0233)	(0.0253)	(0.0189)	(0.030)
lever	−0.126 ***	−0.127 ***	−0.127 ***	−0.127 ***	−0.012	−0.010	−0.013	−0.010
	(0.027)	(0.027)	(0.027)	(0.027)	(0.051)	(0.051)	(0.051)	(0.051)
beta	−0.000	−0.001	−0.001	−0.000	−0.015	−0.015	−0.015	−0.015
	(0.002)	(0.002)	(0.003)	(0.002)	(0.032)	(0.033)	(0.032)	(0.033)
k_d	−0.002	−0.002	−0.002	−0.002	−0.014	−0.014	−0.014	−0.014
	(0.002)	(0.002)	(0.002)	(0.002)	(0.014)	(0.014)	(0.014)	(0.014)
dep_{t-1}	0.28 ***	0.28 ***	0.29 ***	0.28 ***	0.69 ***	0.69 ***	0.69 ***	0.69 ***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)
R^2	0.178	0.177	0.173	0.176	0.456	0.456	0.456	0.456

Notes: This table reports the estimation results of Equations (5) and (7), which examine the moderating effect of firms' information environment on the relationship of ESG with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. *env* is the environmental component, *soc* is the social component, and *gov* is the governance component. *esg* represents the combined ESG score. *interact.* represents the interaction term between the information environment index and one of the ESG components or the combined ESG score. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable (dep_{t-1}). The sampling period is from 2002 to 2022. To save space, the coefficient of the constant term is not reported. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

In our models incorporating the interaction term, we observe a negative impact of ESG components on the return on assets. We also see that the interactions between firms' information environment and environmental and social scores are not statistically significant. Nevertheless, we see that firms' information environment significantly moderates the association of governance scores and combined ESG scores with return on assets. Both coefficients are positive and statistically significant at the 0.1 level. The results suggest that the negative effect of governance scores and combined ESG scores on return on assets are significantly lower for firms with a better information environment. However, the moderating effect of firms' information environment does not exist when the dependent variable is Tobin's Q. We see that ESG performance does not have a significant relationship with firm value, and the information environment, which is positively associated with firm value on its own, does not make this relationship more significant.

Overall, our results suggest that ESG performance is negatively associated with profitability but is not significantly associated with firm value in European markets. We do not detect a difference in the direction of the statistically significant relations among the ESG components. However, the governance score differs from the others regarding the effect size. The loss in profitability exists despite lower capital expenditures and higher gross margins. One of the most important factors reducing profitability is that companies with high ESG scores do not have sufficient sales revenue relative to their assets. Accordingly, combined ESG scores do not significantly decrease the profitability of companies with the highest asset turnover rate. We also find that the negative effect of ESG performance decreases with additional ESG scores and a better information environment. The results suggest that the environmental and governance scores are significantly and negatively associated with firm value but only in quadratic models. Our findings heavily support

the value-destroying view and show that ESG harms financial performance, specifically profitability. Furthermore, the findings support Hypothesis 1 of this study and show that a better information environment is associated with better financial performance. On the other hand, Hypothesis 2 is only partially supported. The information environment moderates the relationship between ESG and profitability but does not have an impact on the ESG–Tobin's Q ratio relationship.

4.2. The Growth in ESG Performance

In this section, we investigate how the growth in ESG performance is associated with profitability and firm value. We also examine whether firms' information environment has any moderating role in these relationships. Table 10 reports the results of the primary model, and Table 11 reports the results of the models with interaction terms. We see that only the coefficient of the environmental score for return on assets is statistically significant in both tables. Unlike environmental performance levels, environmental performance growth is positively associated with return on assets. Table 10 shows no statistical significance for the other ESG components.

Table 10. The growth in ESG performance, profitability, and the firm value.

	Panel A: *roa*				**Panel B: *tobin***			
denv	0.0009 *				−0.0023			
	(0.0005)				(0.0028)			
dsoc		0.0011				−0.0081		
		(0.0012)				(0.0058)		
dgov			0.0016				−0.0006	
			(0.0015)				(0.0057)	
desg				0.0021				−0.002
				(0.0017)				(0.005)
ie	0.0146 ***	0.0133 ***	0.0133 ***	0.0133 ***	0.035 ***	0.031 **	0.031 **	0.03 **
	(0.0025)	(0.0023)	(0.0023)	(0.0023)	(0.013)	(0.013)	(0.013)	(0.01)
lever	−0.128 ***	−0.129 ***	−0.129 ***	−0.129 ***	−0.005	−0.010	−0.001	−0.01
	(0.028)	(0.027)	(0.027)	(0.027)	(0.059)	(0.053)	(0.053)	(0.05)
beta	0.001	−0.001	−0.001	−0.001	−0.009	−0.019	−0.019	−0.019
	(0.003)	(0.003)	(0.003)	(0.003)	(0.035)	(0.033)	(0.033)	(0.033)
k_d	−0.002	−0.002	−0.002	−0.002	−0.011	−0.012	−0.012	−0.012
	(0.002)	(0.002)	(0.002)	(0.002)	(0.014)	(0.015)	(0.015)	(0.015)
dep_{t-1}	0.26 ***	0.28 ***	0.28 ***	0.28 ***	0.68 ***	0.69 ***	0.69 ***	0.69 ***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)
R^2	0.178	0.177	0.173	0.176	0.456	0.456	0.456	0.456

Notes: This table reports the estimation results for the moderating effect of firms' information environment on the relationship of the year-over-year growth in ESG performance with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. *denv*, *dsoc*, and *dgov* respectively represent the growth in the environmental component, social component, and governance component. *desg* represents the growth in the combined ESG score. *interaction* represents the interaction term between the information environment index and growth rates in one of the ESG components or the combined ESG score. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable (dep_{t-1}). The sampling period is from 2003 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Nevertheless, in Table 11, models with interaction terms show that the growth in combined ESG scores is also positively associated with return on assets. The interaction between the growth in combined ESG scores and firms' information environment is also significantly positive at the 0.05 level. The results in this section suggest that the growth in ESG performance is positively associated with return on assets and that this relationship is more pronounced in firms with a better information environment. Although we see differences in the effects of ESG performance levels and the growth in ESG performance on return on assets, there is no difference in their effects on Tobin's Q ratio. None of the ESG coefficients are statistically significant at conventional levels in Tables 10 and 11, which

shows that the growth in ESG performance is not significantly associated with firm value. In Table 11, we also see insignificant interaction terms, suggesting that firms' information environment does not have a role in the relationship between ESG performance and firm value, though the information environment has a positive relationship with the latter.

Table 11. The interaction between the growth in ESG and the information environment.

	Panel A: *roa*				**Panel B: *tobin***			
denv	0.0011 **				0.0002			
	(0.0005)				(0.0037)			
dsoc		0.0020				−0.0183		
		(0.0013)				(0.0167)		
dgov			0.0025 *				0.0095	
			(0.0014)				(0.0110)	
desg				0.0038 **				−0.005
				(0.0017)				(0.044)
interact.	0.0003	0.001	0.0016	0.0021 **	0.0045	−0.0042	0.0058	−0.001
	(0.0005)	(0.001)	(0.0014)	(0.0009)	(0.0031)	(0.0058)	(0.004)	(0.016)
ie	0.015 ***	0.013 ***	0.013 ***	0.013 ***	0.035 ***	0.032 **	0.031 **	0.03 **
	(0.003)	(0.002)	(0.002)	(0.002)	(0.013)	(0.013)	(0.013)	(0.01)
lever	−0.128 ***	−0.129 ***	−0.130 ***	−0.129 ***	−0.004	−0.011	−0.01	−0.01
	(0.028)	(0.027)	(0.027)	(0.027)	(0.059)	(0.053)	(0.05)	(0.05)
beta	0.001	−0.001	−0.001	−0.000	−0.009	−0.019	−0.019	−0.019
	(0.002)	(0.003)	(0.003)	(0.003)	(0.035)	(0.033)	(0.033)	(0.033)
k_d	−0.002	−0.002	−0.002	−0.002	−0.011	−0.012	−0.012	−0.012
	(0.002)	(0.002)	(0.002)	(0.002)	(0.014)	(0.015)	(0.015)	(0.015)
dep_{t-1}	0.26 ***	0.28 ***	0.28 ***	0.28 ***	0.68 ***	0.69 ***	0.69 ***	0.69 ***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)
R^2	0.159	0.169	0.169	0.169	0.449	0.456	0.456	0.456

Notes: This table reports the estimation results for the relationship of the year-over-year growth in ESG performance with profitability and firm value. The dependent variable is the return on assets (*roa*) in Panel A and Tobin's Q (*tobin*) in Panel B. *denv*, *dsoc*, and *dgov* respectively represent the growth in the environmental component, social component, and governance component. *desg* represents the growth in the combined ESG score. *interact* represents the interaction term between the information environment index and the growth in one of the ESG components or the combined ESG score. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable (dep_{t-1}). The sampling period is from 2003 to 2022. To save space, the coefficient of the constant term is not reported. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

4.3. Additional Models

We run additional models to deepen our understanding of the ESG–financial performance relationship. First, we consider industry-adjusted values. We group firms according to their Standard Industrial Classification (SIC) codes and calculate yearly mean industry ESG scores. Then, we normalize combined ESG scores by dividing them by industry averages to see firms' relative ESG performance. We apply the same procedure for the profitability and firm value variables to run our base model using industry-adjusted values. Second, we calculate country-adjusted values to examine firm performance relative to the country averages. Country-adjusted values are calculated using the same method used to calculate industry-adjusted values. Table 12 reports the results of both industry-adjusted models and country-adjusted models. Panel A in Table 12 shows that the relationship of ESG with profitability exhibits some differences when ESG and profitability variables are adjusted. The coefficient of the industry-adjusted ESG scores (*esg_ind_adj*) is still negative and statistically significant at the 0.1 level. A significantly negative *esg_ind_adj* coefficient shows that having a higher ESG performance relative to the industry average results in lower returns on assets relative to the industry averages. On the other hand, the coefficient of the country-adjusted ESG scores (*esg__ctry_adj*) is negative but statistically insignificant, showing that a relatively high ESG performance compared to the country averages does not impact profitability. Nonetheless, the results reported in Panel B are consistent with

our previous models and show that the insignificant association of ESG with firm value is robust to using industry- and country-adjusted values. In Panel B, *esg_ind_adj* and *esg__ctry_adj* are both statistically insignificant and do not affect firm value.

Table 12. Adjusted values based on industry and country.

	Panel A: *roa_adj*		**Panel B: *tobin_adj***	
esg_ind_adj	−2.296 *		−0.030	
	(1.337)		(0.025)	
esg_ctry_adj		−11.00		−0.021
		(8.882)		(0.022)
ie	1.504 **	−0.697	0.005	0.004
	(0.721)	(3.977)	(0.008)	(0.007)
lever	−2.590	−31.68	−0.006	−0.027
	(1.576)	(31.06)	(0.032)	(0.028)
beta	−1.091 *	3.245	−0.004	−0.001
	(0.634)	(2.886)	(0.018)	(0.014)
k_d	−0.069	−0.252	−0.008	−0.011
	(0.054)	(0.246)	(0.010)	(0.012)
dep_{t-1}	−0.070 ***	−0.0850 ***	0.702 ***	0.709 ***
	(0.020)	(0.00148)	(0.025)	(0.030)
Cons.	5.128 ***	17.26	0.338 ***	0.318 ***
	(1.813)	(16.10)	(0.031)	(0.032)
Obs.	9761	9761	9229	9229
R^2	0.008	0.008	0.490	0.512

Notes: This table reports the estimation results of Equations (2) and (3), using industry- and country-adjusted values. The dependent variable is the adjusted return on assets (*roa_adj*) in Panel A and adjusted Tobin's Q (*tobin_adj*) in Panel B. *esg_ind_adj* represents the industry-adjusted ESG scores. *esg_ctry_adj* represents the country-adjusted ESG scores. The control variables are the information environment index (*ie*), leverage ratio (*lever*), historic beta (*beta*), cost of debt (k_d), and the one-year lagged value of the dependent variable (dep_{t-1}). The sampling period is from 2002 to 2022. We use fixed-effects regressions with heteroskedasticity consistent standard errors. Standard errors are in parentheses. Asterisks represent statistical significance. *** < 0.01, ** < 0.05, * < 0.1.

Finally, we run our base model using an additional control variable. We include the natural logarithm of total assets to adjust for firm size and obtain similar results to our previous models. For the sake of brevity, we do not report the results of this model. Briefly, ESG still has a negative and statistically significant association with profitability with a *p*-value of 0.06, but it has no significant effect on firm value.

5. Conclusions

The emerging demand for environmentally respectful and sustainable companies raises exciting questions for firm and corporate finance theories. Companies may allocate more capital to ESG practices to respond to the emerging demand and be more environmentally friendly and sustainable. The ESG demand can affect their entire business model (e.g., waste and pollution reduction, collaborative relationship with stakeholders, water efficiency) and how they report information about their operations (e.g., sustainability reports). On the one hand, these efforts can improve the financial performance of companies as they would allow for more transparent and efficient operations that are beneficial for all parties involved in business transactions. On the other hand, the initial costs associated with sustainable operations may harm financial performance or prevent companies from embarking on any initiatives. As empirical research provides evidence for both theoretical links, we further examine, in detail, the relationship between ESG and financial performance, focusing on stocks in European countries where there are regulations regarding ESG practices and various reporting requirements.

Using Refinitiv's ESG scores to measure a firm's ESG performance from 2002 to 2022, we show that ESG is negatively associated with the return on assets of European companies. We observe this decrease in profitability despite less capital expenditure and higher gross margins. We show that firms with good ESG performance have poor performance in

generating revenue relative to their asset sizes. The results show that ESG is negatively associated with the asset turnover ratio, and the negative relationship between ESG and return on assets does not exist for firms with high asset turnover ratios. Moreover, the results show that the relationship between ESG and return on assets is convex and becomes positive when firms reach a certain high level of ESG performance.

We further examine the variables that can moderate the profitability relationship with the ESG and focus on firms' information environment. We consider ESG performance as information that needs to be processed by market players and stakeholders and argue that processing this information will be easier for companies with a better information environment. In order to measure the information environment, which is elusive and multidimensional, we create an information environment index using several proxy variables frequently used in the literature. The results show that the information environment index is positively associated with profitability. Moreover, the negative association of ESG with profitability is weaker in firms with better information environments. We also find that the growth in ESG performance has a positive relationship with profitability, contrary to the effects of the levels of ESG performance, and this positive relationship is more substantial in companies with a better information environment.

Furthermore, although we find that the relationship between ESG and profitability is statistically significant and affected by many factors, we do not find a similar relationship between ESG and firm value. In most models, ESG has no significant association with firm value. Nevertheless, in a quadratic model, we show that governance performance negatively affects firm value. This negative effect turns positive after the governance score exceeds 50.30. The information environment index, which has a positive relationship with firm value, has no role in the effects of ESG on firm value.

Refs. [95,96] argue that measurement methods, sample size, and duration affect the results of studies investigating the relationship between ESG performance and financial performance. Conflicting results found in the literature, consistent with both stakeholder theory and the value-destroying view, necessitate comprehensive studies investigating the relationship of ESG with financial performance and the variables that may affect this relationship. Our study provides valuable insights on establishing a more effective ESG strategy by showing the channels through which ESG performance can harm shareholder value. Our results showed that increasing ESG levels to very elevated scores diminishes possible negative effects on company profitability. For this reason, companies that aim or feel obliged to respond to the ESG demands in their business environments can set the bar very high and target high-level ESG performance instead of settling with mediocre ESG performance. At the same time, companies can reduce the negative effects of ESG initiatives on profitability and avoid unnecessary extra costs by keeping their information environment transparent so that internal and external stakeholders can access better information about the company and its activities. Having a better information environment for companies seems to be an issue that needs to be emphasized, considering that it directly increases profitability and firm value and decreases the negative effects of ESG on profitability. Therefore, achieving a more transparent information environment should be an important goal in strategic ESG planning.

Our study is subject to a few limitations. First, due to data availability, we perform our analysis with yearly data and have a maximum of 20 observations for a company. A possible counterargument for the stakeholder theory is that the positive effects of ESG can emerge over the longer term. To examine this possibility, the sample period must be much longer, and sufficient ESG data must be available. Second, investor attention and attitude to ESG are beyond the scope of this study. A better ESG score can enhance market valuations when investors are more attentive to ESG pillars and have a favorable view of them. Future studies can evaluate time variation in investor attention to the ESG factors and how it can affect the ESG–financial performance relationship. Future research can also examine whether companies strategically use different tones or complexities in communicating

their ESG performance to obfuscate investors, hide or greenwash worse-than-expected performance, or alter investor perception about ESG deficiencies.

Author Contributions: Conceptualization, O.B. and S.A.; methodology, O.B. and S.A.; software, S.A.; formal analysis, S.A.; writing—original draft preparation, O.B. and S.A.; supervision, O.B.; project administration, O.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Restrictions apply to the availability of these data. Data were obtained from Datastream. Requests to access the data should be directed to Refinitiv.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Hoffman, A.J.; Ehrenfeld, J.R. The Fourth Wave: Management Science and Practice in the Age of the Anthropocene. In *Corporate Stewardship: Achieving Sustainable Effectiveness*; Greenleaf Publishing Limited: Sheffield, UK, 2015; pp. 227–246, ISBN 978-1-78353-260-5.
2. The United Nations Global Compact. *The United Nations Global Compact-Accenture Strategy CEO Study on Sustainability*; The United Nations Global Compact: Melbourne, Australia, 2019; p. 43.
3. Bello, Z.Y. Socially Responsible Investing and Portfolio Diversification. *J. Financ. Res.* **2005**, *28*, 41–57. [CrossRef]
4. Hill, R.P.; Ainscough, T.; Shank, T.; Manullang, D. Corporate Social Responsibility and Socially Responsible Investing: A Global Perspective. *J. Bus. Ethics* **2007**, *70*, 165–174. [CrossRef]
5. Kempf, A.; Osthoff, P. The Effect of Socially Responsible Investing on Portfolio Performance. *Eur. Financ. Manag.* **2007**, *13*, 908–922. [CrossRef]
6. Dellink, R.; den Elzen, M.; Aiking, H.; Bergsma, E.; Berkhout, F.; Dekker, T.; Gupta, J. Sharing the Burden of Financing Adaptation to Climate Change. *Glob. Environ. Chang.* **2009**, *19*, 411–421. [CrossRef]
7. Grasso, M. An Ethical Approach to Climate Adaptation Finance. *Glob. Environ. Chang.* **2010**, *20*, 74–81. [CrossRef]
8. Pittel, K.; Rübbelke, D. International Climate Finance and Its Influence on Fairness and Policy. *World Econ.* **2013**, *36*, 419–436. [CrossRef]
9. Glänzel, G.; Scheuerle, T. Social Impact Investing in Germany: Current Impediments from Investors' and Social Entrepreneurs' Perspectives. *Voluntas* **2016**, *27*, 1638–1668. [CrossRef]
10. Viviani, J.-L.; Maurel, C. Performance of Impact Investing: A Value Creation Approach. *Res. Int. Bus. Financ.* **2019**, *47*, 31–39. [CrossRef]
11. Dalal, K.K.; Thaker, N. ESG and Corporate Financial Performance: A Panel Study of Indian Companies. *IUP J. Corp. Gov.* **2019**, *18*, 44–59.
12. Yoon, B.; Lee, J.H.; Byun, R. Does ESG Performance Enhance Firm Value? Evidence from Korea. *Sustainability* **2018**, *10*, 3635. [CrossRef]
13. Zhao, C.; Guo, Y.; Yuan, J.; Wu, M.; Li, D.; Zhou, Y.; Kang, J. ESG and Corporate Financial Performance: Empirical Evidence from China's Listed Power Generation Companies. *Sustainability* **2018**, *10*, 2607. [CrossRef]
14. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Pitman: Pitman, NJ, USA, 1984; ISBN 978-0-273-01913-8.
15. Branco, M.C.; Rodrigues, L.L. Corporate Social Responsibility and Resource-Based Perspectives. *J. Bus. Ethics* **2006**, *69*, 111–132. [CrossRef]
16. Cheng, B.; Ioannou, I.; Serafeim, G. Corporate Social Responsibility and Access to Finance. *Strateg. Manag. J.* **2014**, *35*, 1–23. [CrossRef]
17. Ortas, E.; Gallego-Álvarez, I.; Álvarez, I. National Institutions, Stakeholder Engagement, and Firms' Environmental, Social, and Governance Performance. *Corp. Soc. Responsib. Environ. Manag.* **2019**, *26*, 598–611. [CrossRef]
18. Aydoğmuş, M.; Gülay, G.; Ergun, K. Impact of ESG Performance on Firm Value and Profitability. *Borsa Istanb. Rev.* **2022**, *22*, S119–S127. [CrossRef]
19. De Lucia, C.; Pazienza, P.; Bartlett, M. Does Good ESG Lead to Better Financial Performances by Firms? Machine Learning and Logistic Regression Models of Public Enterprises in Europe. *Sustainability* **2020**, *12*, 5317. [CrossRef]
20. Velte, P. Does ESG Performance Have an Impact on Financial Performance? Evidence from Germany. *J. Glob. Responsib.* **2017**, *8*, 169–178. [CrossRef]
21. Di Giuli, A.; Kostovetsky, L. Are Red or Blue Companies More Likely to Go Green? Politics and Corporate Social Responsibility. *J. Financ. Econ.* **2014**, *111*, 158–180. [CrossRef]
22. Masulis, R.W.; Reza, S.W. Agency Problems of Corporate Philanthropy. *Rev. Financ. Stud.* **2015**, *28*, 592–636. [CrossRef]

23. Bushman, R.M.; Piotroski, J.D.; Smith, A.J. What Determines Corporate Transparency? *J. Account. Res.* **2004**, *42*, 207–252. [CrossRef]
24. Collins, D.W.; Kothari, S.P. An Analysis of Intertemporal and Cross-Sectional Determinants of Earnings Response Coefficients. *J. Account. Econ.* **1989**, *11*, 143–181. [CrossRef]
25. Albitar, K.; Hussainey, K.; Kolade, N.; Gerged, A.M. ESG Disclosure and Firm Performance before and after IR: The Moderating Role of Governance Mechanisms. *Int. J. Account. Inf. Manag.* **2020**, *28*, 429–444. [CrossRef]
26. Fatemi, A.; Glaum, M.; Kaiser, S. ESG Performance and Firm Value: The Moderating Role of Disclosure. *Glob. Financ. J.* **2018**, *38*, 45–64. [CrossRef]
27. Mervelskemper, L.; Streit, D. Enhancing Market Valuation of ESG Performance: Is Integrated Reporting Keeping Its Promise? *Bus. Strategy Environ.* **2017**, *26*, 536–549. [CrossRef]
28. Abdi, Y.; Li, X.; Càmara-Turull, X. Exploring the Impact of Sustainability (ESG) Disclosure on Firm Value and Financial Performance (FP) in Airline Industry: The Moderating Role of Size and Age. *Environ. Dev. Sustain.* **2022**, *24*, 5052–5079. [CrossRef]
29. Chen, Z.; Xie, G. ESG Disclosure and Financial Performance: Moderating Role of ESG Investors. *Int. Rev. Financ. Anal.* **2022**, *83*, 102291. [CrossRef]
30. Wen, H.; Ho, K.C.; Gao, J.; Yu, L. The Fundamental Effects of ESG Disclosure Quality in Boosting the Growth of ESG Investing. *J. Int. Financ. Mark. Inst. Money* **2022**, *81*, 101655. [CrossRef]
31. Sinnewe, E.; Yao, T.; Zaman, M. Informing or Obfuscating Stakeholders: Integrated Reporting and the Information Environment. *Bus. Strategy Environ.* **2021**, *30*, 3893–3906. [CrossRef]
32. Wahl, A.; Charifzadeh, M.; Diefenbach, F. Voluntary Adopters of Integrated Reporting–Evidence on Forecast Accuracy and Firm Value. *Bus. Strateg. Environ.* **2020**, *29*, 2542–2556. [CrossRef]
33. Caglio, A.; Melloni, G.; Perego, P. Informational Content and Assurance of Textual Disclosures: Evidence on Integrated Reporting. *Eur. Account. Rev.* **2020**, *29*, 55–83. [CrossRef]
34. Simnett, R.; Vanstraelen, A.; Chua, W.F. Assurance on Sustainability Reports: An International Comparison. *Account. Rev.* **2009**, *84*, 937–967. [CrossRef]
35. von Koch, C.; Willesson, M. Firms' Information Environment Measures: A Literature Review with Focus on Causality. *Manag. Financ.* **2020**, *46*, 1343–1372. [CrossRef]
36. Griffin, P.A. Got Information? Investor Response to Form 10-K and Form 10-Q EDGAR Filings. *Rev. Account. Stud.* **2003**, *8*, 433–460. [CrossRef]
37. Rajan, R.G.; Zingales, L. What Do We Know about Capital Structure? Some Evidence from International Data. *J. Financ.* **1995**, *50*, 1421–1460. [CrossRef]
38. Banz, R.W. The Relationship between Return and Market Value of Common Stocks. *J. Financ. Econ.* **1981**, *9*, 3–18. [CrossRef]
39. Fama, E.F.; French, K.R. Common Risk Factors in the Returns on Stocks and Bonds. *J. Financ. Econ.* **1993**, *33*, 3–56. [CrossRef]
40. Evans, D.S. The Relationship between Firm Growth, Size, and Age: Estimates for 100 Manufacturing Industries. *J. Ind. Econ.* **1987**, *35*, 567–581. [CrossRef]
41. Acs, Z.J.; Audretsch, D.B. Innovation in Large and Small Firms: An Empirical Analysis. *Am. Econ. Rev.* **1988**, *78*, 678–690.
42. Friede, G.; Busch, T.; Bassen, A. ESG and Financial Performance: Aggregated Evidence from More than 2000 Empirical Studies. *J. Sustain. Financ. Invest.* **2015**, *5*, 210–233. [CrossRef]
43. Alshehhi, A.; Nobanee, H.; Khare, N. The Impact of Sustainability Practices on Corporate Financial Performance: Literature Trends and Future Research Potential. *Sustainability* **2018**, *10*, 494. [CrossRef]
44. Ahmad, N.; Mobarek, A.; Roni, N.N. Revisiting the Impact of ESG on Financial Performance of FTSE350 UK Firms: Static and Dynamic Panel Data Analysis. *Cogent Bus. Manag.* **2021**, *8*, 1900500. [CrossRef]
45. Wu, S.; Li, X.; Du, X.; Li, Z. The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure. *Sustainability* **2022**, *14*, 14507. [CrossRef]
46. Bhaskaran, R.K.; Ting, I.W.K.; Sukumaran, S.K.; Sumod, S.D. Environmental, Social and Governance Initiatives and Wealth Creation for Firms: An Empirical Examination. *Manag. Decis. Econ.* **2020**, *41*, 710–729. [CrossRef]
47. Humphrey, J.E.; Lee, D.D.; Shen, Y. Does It Cost to Be Sustainable? *J. Corp. Financ.* **2012**, *18*, 626–639. [CrossRef]
48. Landi, G.; Sciarelli, M. Towards a More Ethical Market: The Impact of ESG Rating on Corporate Financial Performance. *Soc. Responsib. J.* **2018**, *15*, 11–27. [CrossRef]
49. Velte, P. Does CEO Power Moderate the Link between ESG Performance and Financial Performance? A Focus on the German Two-Tier System. *Manag. Res. Rev.* **2019**, *43*, 497–520. [CrossRef]
50. Nekhili, M.; Boukadhaba, A.; Nagati, H.; Chtioui, T. ESG Performance and Market Value: The Moderating Role of Employee Board Representation. *Int. J. Hum. Resour. Manag.* **2021**, *32*, 3061–3087. [CrossRef]
51. Qureshi, M.A.; Kirkerud, S.; Theresa, K.; Ahsan, T. The Impact of Sustainability (Environmental, Social, and Governance) Disclosure and Board Diversity on Firm Value: The Moderating Role of Industry Sensitivity. *Bus. Strategy Environ.* **2020**, *29*, 1199–1214. [CrossRef]
52. Chang, Y.-J.; Lee, B.-H. The Impact of ESG Activities on Firm Value: Multi-Level Analysis of Industrial Characteristics. *Sustainability* **2022**, *14*, 14444. [CrossRef]
53. Frankel, R.; Li, X. Characteristics of a Firm's Information Environment and the Information Asymmetry between Insiders and Outsiders. *J. Account. Econ.* **2004**, *37*, 229–259. [CrossRef]

54. Minnis, M. The Value of Financial Statement Verification in Debt Financing: Evidence from Private US Firms. *J. Account. Res.* **2011**, *49*, 457–506. [CrossRef]
55. Haw, I.-M.; Hu, B.; Lee, J.J.; Wu, W. Investor Protection and Price Informativeness about Future Earnings: International Evidence. *Rev. Account. Stud.* **2012**, *17*, 389–419. [CrossRef]
56. Griffin, P.A.; Sun, Y. Going Green: Market Reaction to CSRwire News Releases. *J. Account. Public. Policy* **2013**, *32*, 93–113. [CrossRef]
57. Lu, L.Y.; Shailer, G.; Yu, Y. Corporate Social Responsibility Disclosure and the Value of Cash Holdings. *Eur. Account. Rev.* **2017**, *26*, 729–753. [CrossRef]
58. Du, S.; Yu, K.; Bhattacharya, C.B.; Sen, S. The Business Case for Sustainability Reporting: Evidence from Stock Market Reactions. *J. Public. Policy Mark.* **2017**, *36*, 313–330. [CrossRef]
59. Grassmann, M. The Relationship between Corporate Social Responsibility Expenditures and Firm Value: The Moderating Role of Integrated Reporting. *J. Clean. Prod.* **2021**, *285*, 124840. [CrossRef]
60. Krueger, P.; Sautner, Z.; Tang, D.Y.; Zhong, R. *The Effects of Mandatory ESG Disclosure Around the World 2023*; Swiss Finance Institute: Geneva, Switzerland, 2023.
61. Lang, M.H.; Lins, K.V.; Miller, D.P. ADRs, Analysts, and Accuracy: Does Cross Listing in the United States Improve a Firm's Information Environment and Increase Market Value? *J. Account. Res.* **2003**, *41*, 317–345. [CrossRef]
62. Hail, L.; Leuz, C. Cost of Capital Effects and Changes in Growth Expectations around US Cross-Listings. *J. Financ. Econ.* **2009**, *93*, 428–454. [CrossRef]
63. Aggarwal, R.; Cao, J.; Chen, F. Information Environment, Dividend Changes, and Signaling: Evidence from ADR Firms. *Contemp. Account. Res.* **2012**, *29*, 403–431. [CrossRef]
64. Ghadhab, I.; M'rad, M. Does US Cross-Listing Come with Incremental Benefit for Already UK Cross-Listed Firms. *Q. Rev. Econ. Financ.* **2018**, *69*, 188–204. [CrossRef]
65. Mitra, S.; Cready, W.M. Institutional Stock Ownership, Accrual Management, and Information Environment. *J. Account. Audit. Financ.* **2005**, *20*, 257–286. [CrossRef]
66. Cahan, S.F.; Emanuel, D.; Sun, J. The Effect of Earnings Quality and Country-Level Institutions on the Value Relevance of Earnings. *Rev. Quant. Finan Acc.* **2009**, *33*, 371–391. [CrossRef]
67. Li, T.; Zaiats, N. Information Environment and Earnings Management of Dual Class Firms around the World. *J. Bank. Financ.* **2017**, *74*, 1–23. [CrossRef]
68. Ye, Q.; Gao, J.; Zheng, W. Accounting Standards, Earnings Transparency and Audit Fees: Convergence with IFRS in China. *Aust. Account. Rev.* **2018**, *28*, 525–537. [CrossRef]
69. Epstein, M.J.; Roy, M.-J. Improving Sustainability Performance: Specifying, Implementing and Measuring Key Principles. *J. Gen. Manag.* **2003**, *29*, 15–31. [CrossRef]
70. Mishra, K.; Boynton, L.; Mishra, A. Driving Employee Engagement: The Expanded Role of Internal Communications. *Int. J. Bus. Commun.* **2014**, *51*, 183–202. [CrossRef]
71. Glavas, A.; Kelley, K. The Effects of Perceived Corporate Social Responsibility on Employee Attitudes. *Bus. Ethics, Q.* **2014**, *24*, 165–202. [CrossRef]
72. Duarte, J.; Han, X.; Harford, J.; Young, L. Information Asymmetry, Information Dissemination and the Effect of Regulation FD on the Cost of Capital. *J. Financ. Econ.* **2008**, *87*, 24–44. [CrossRef]
73. Farber, D.B.; Huang, S.X.; Mauldin, E. Audit Committee Accounting Expertise, Analyst Following, and Market Liquidity. *J. Account. Audit. Financ.* **2018**, *33*, 174–199. [CrossRef]
74. Zolotoy, L. Earnings Surprise Implicit in Stock Prices: Which Earnings Forecasting Models Are Investors Using and What Determines Their Choice? *J. Bus. Financ. Account.* **2012**, *39*, 1161–1179. [CrossRef]
75. Chen, C.J.; Ding, Y.; Kim, C. (Francis) High-Level Politically Connected Firms, Corruption, and Analyst Forecast Accuracy around the World. *J. Int. Bus. Stud.* **2010**, *41*, 1505–1524. [CrossRef]
76. Giraldo, M. Dynamics of Analysts' Coverage and the Firms' Information Environment. *Int. Rev. Financ. Anal.* **2011**, *20*, 345–354. [CrossRef]
77. Aitken, M.; Almeida, N.; Harris, F.H.D.; McInish, T. Financial Analysts and Price Discovery. *Account. Financ.* **2008**, *48*, 1–24. [CrossRef]
78. Kang, T.; Krishnan, G.V.; Wolfe, M.C.; Yi, H.S. The Impact of Eliminating the 20-F Reconciliation Requirement for IFRS Filers on Earnings Persistence and Information Uncertainty. *Account. Horiz.* **2012**, *26*, 741–765. [CrossRef]
79. Brockman, P.; Yan, X. (Sterling) Block Ownership and Firm-Specific Information. *J. Bank. Financ.* **2009**, *33*, 308–316. [CrossRef]
80. Fan, S. Corporate Governance and Information Content of Stock Trades: Evidence from S&P 100 Companies. *Int. J. Bus. Financ. Res.* **2013**, *7*, 41–56.
81. Akins, B.K.; Ng, J.; Verdi, R.S. Investor Competition over Information and the Pricing of Information Asymmetry. *Account. Rev.* **2012**, *87*, 35–58. [CrossRef]
82. Armstrong, C.S.; Balakrishnan, K.; Cohen, D. Corporate Governance and the Information Environment: Evidence from State Antitakeover Laws. *J. Account. Econ.* **2012**, *53*, 185–204. [CrossRef]
83. Baker, M.; Wurgler, J. Investor Sentiment and the Cross-Section of Stock Returns. *J. Financ.* **2006**, *61*, 1645–1680. [CrossRef]
84. Botosan, C.A. Disclosure Level and the Cost of Equity Capital. *Account. Rev.* **1997**, *72*, 323–349.

85. Barber, B.M.; Odean, T. All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. *Rev. Financ. Stud.* **2008**, *21*, 785–818. [CrossRef]
86. Bushee, B.J.; Miller, G.S. Investor Relations, Firm Visibility, and Investor Following. *Account. Rev.* **2012**, *87*, 867–897. [CrossRef]
87. Copeland, T.E.; Galai, D. Information Effects on the Bid-Ask Spread. *J. Financ.* **1983**, *38*, 1457–1469. [CrossRef]
88. Glosten, L.R.; Milgrom, P.R. Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders. *J. Financ. Econ.* **1985**, *14*, 71–100. [CrossRef]
89. Venkatesh, P.C.; Chiang, R. Information Asymmetry and the Dealer's Bid-Ask Spread: A Case Study of Earnings and Dividend Announcements. *J. Financ.* **1986**, *41*, 1089–1102. [CrossRef]
90. Bamber, L.S.; Barron, O.E.; Stober, T.L. Trading Volume and Different Aspects of Disagreement Coincident with Earnings Announcements. *Account. Rev.* **1997**, *72*, 575–597.
91. Diether, K.B.; Malloy, C.J.; Scherbina, A. Differences of Opinion and the Cross Section of Stock Returns. *J. Financ.* **2002**, *57*, 2113–2141. [CrossRef]
92. Liang, H.; Renneboog, L. Corporate Donations and Shareholder Value. *Oxf. Rev. Econ. Policy* **2017**, *33*, 278–316. [CrossRef]
93. Amin, N.; Tauseef, S. Does an Optimal ESG Score Exist? Evidence from China. *Macroecon. Financ. Emerg. Mark. Econ.* **2022**, 1–19. [CrossRef]
94. El Khoury, R.; Nasrallah, N.; Alareeni, B. ESG and Financial Performance of Banks in the MENAT Region: Concavity–Convexity Patterns. *J. Sustain. Financ. Invest.* **2023**, *13*, 406–430. [CrossRef]
95. Albertini, E. Does Environmental Management Improve Financial Performance? A Meta-Analytical Review. *Organ. Environ.* **2013**, *26*, 431–457. [CrossRef]
96. Quazi, A.; Richardson, A. Sources of Variation in Linking Corporate Social Responsibility and Financial Performance. *Soc. Responsib. J.* **2012**, *8*, 242–256. [CrossRef]