When Nonmateriality is Material: Impact of ESG Emphasis on Firm Value

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Abstract

In recent years, environmental, social, and governance (ESG) factors have emerged as a controversial topic. This study examines the presence and the impact of emphasizing nonmaterial ESG factors on firm value. ESG factors are considered nonmaterial (or material) when excluding them from corporate disclosure would not (or would) significantly alter the overall information available to a reasonable investor. Drawing on agency theory, the authors argue that managers may potentially divert their attention from firm value-maximizing activities by emphasizing nonmaterial ESG factors to enhance their own reputations. The authors measure ESG emphasis by applying a deep learning model to earnings call transcripts of 5,079 firms from 2005 to 2021. They demonstrate that, on average, managers emphasize nonmaterial ESG issues more than material ESG issues. In line with the predictions of agency theory, the authors find a positive association between nonmaterial ESG emphasis and media mentions of the firms. Analysis based on panel data models with a control function approach reveals that a 10% higher emphasis on nonmaterial ESG factors leads to a significant 10.7% decline in firm value, and shows that this negative impact intensifies over time. Furthermore, it is stronger for firms with higher free cash flow and weaker for firms with higher market share. Finally, the authors develop an interactive web app (https://bit.ly/esg_app) that assists executives and investors in comparing their companies against competitors and quantifying the impact of shifting ESG emphasis on the firm value.

Keywords

ESG, firm value, material, nonmaterial, deep learning, ESG-BERT, earnings call

1. Introduction

As the spotlight has shifted from purely financial metrics to a broader spectrum of factors contributing to long-term value creation (Langan and Menz 2022), sustainability initiatives such as environmental, social, and governance (ESG) issues have become crucial for firms. The attention paid to broader societal goals, such as the environment and diversity, has seen a significant increase from around 20 percent of firms in 1980 to 91 percent in 2020 (Rajan et al. 2023). Proponents of ESG argue that investing in firms with higher ESG emphasis leads to superior stock returns for investors while also benefiting other stakeholders and society at large. However, a recent surge in ESG backlash among certain investors and policymakers raises concerns that ESG initiatives may not improve shareholder value (Washington and Jones 2023). Specifically, politicians contend that ESG is harmful to investors because it does not result in enhanced shareholder value.[1] This debate reflects a fundamental tension in sustainability research: how firms can contribute to societal and environmental outcomes while remaining economically viable (Flammer and Loch 2024). Moreover, many companies are struggling with the challenge of determining which specific ESG issues to emphasize from a wide spectrum of ESG factors, spanning from environmental impacts to leadership standards and operational models.

In this research, we argue that not all ESG issues are created equal, and firms should avoid emphasizing ESG issues that are not material for their business. According to the Securities and Exchange Commission (SEC), any information is nonmaterial (material) if its omission from corporate disclosure would not (would) substantially change the overall mix of information available to a reasonable investor (Lee 2021), and this definition also applies to ESG factors. For example, industries like biofuels or forestry often face material ESG risks related to air quality, wastewater management, and climate change, while consumer goods sectors grapple with material issues such as supply chain integrity, material

[1] For example, see the announcement from the Florida Governor Ron DeSantis: https://www.flgov.com/2023/01/17/governor-ron-desantis-further-prohibits-woke-esg-considerations-from-state-investments/#:~:text=The%20proliferation%20of%20ESG%20throughout,have%20a%20secure%20financial%20future

sourcing, and product quality and safety.[2] According to the SEC's definition of materiality, nonmaterial ESG is not expected to affect firm value. Supporting this assertion, prior research found that engaging in material ESG factors enhances firm value, while engaging in nonmaterial ESG factors does not affect it (Khan et al. 2016). In contrast, we argue that emphasizing nonmaterial ESG factors can be harmful to firm value and demonstrate this empirically.

We define ESG emphasis as an organization's strategic prioritization (Martin and Kushwaha 2024) of ESG-related activities or philosophies. Drawing on operations and sustainability research (Atasu et al. 2020, Agrawal et al. 2021), we conceptualize ESG emphasis as a strategic operational prioritization rather than mere disclosure. This definition of emphasis is based upon the attention-based view of the firm (Ocasio 1997) and reflects the intention to engage in material and/or nonmaterial ESG factors. Drawing upon agency theory, we posit that managers may emphasize nonmaterial ESG factors to enhance personal reputation, potentially diverting attention from core managerial duties at the cost of shareholder value (Jensen 2002, p. 200). Nonmaterial ESG factors, such as social activism and charitable contributions, frequently attract substantial media coverage. Research indicates that executives can use disclosures strategically for self-promotion through increasing media coverage of themselves (Blankespoor and deHaan 2020). Put differently, managers might prioritize their own personal interests or reputation enhancement and seek the extra media attention they may receive from emphasizing nonmaterial ESG regardless of whether such emphasis aligns with the company's long-term financial interests. This misalignment between the interests of shareholders and managers can lead to conflicts, inefficiencies, and potential losses for the shareholders (Ross 1973, Jensen and Meckling 1976, Eisenhardt 1989). Consistent with the environmental agency problem explored by Lyon and Maxwell (2011), managerial emphasis on visibility-seeking can constitute a form of green-wash rather than value-enhancing activity. In other words, this pursuit of media coverage can divert managerial focus away from value-maximizing activities and toward superficial gestures that do not necessarily translate into tangible

[2] https://sasb.ifrs.org/standards/materiality-finder/find/

benefits for shareholders (Ocasio and Joseph 2005). Specifically, we hypothesize that nonmaterial ESG emphasis has a significant negative impact on firm value.

We also argue that this relationship between nonmaterial ESG emphasis and firm value could be moderated by three factors. First, we posit that shareholders become better at understanding which ESG factors are nonmaterial and material as such information becomes more widely available, resulting in higher penalties for nonmaterial ESG emphasis over time. Second, firms with greater liquidity, often indicated by free cash flows, are more susceptible to agency problems related to ESG activities (Jensen 1986, Masulis et al. 2009, Servaes and Tamayo 2013). Therefore, we anticipate that the adverse impact of nonmaterial ESG will be exacerbated for firms with higher free cash flow. Third, we predict that a higher market share will mitigate agency costs associated with misalignment between managers' and company interests, thus weakening the negative effect of nonmaterial ESG. Greater market share implies a less complex and more predictable operating environment (Messersmith et al. 2014), aiding investor assessment of managerial actions and reducing agency costs. Additionally, high market share firms attract greater scrutiny due to their influence on prices and competitive dynamics (Eckard Jr 1982, Wörsdörfer 2022), lowering the likelihood of conflicts and further reducing agency costs.

We test our hypotheses by analyzing earnings call transcripts from 5,079 firms containing 10,142,523 sentences, from 2005 to 2021. Using the deep learning model ESG-BERT (Mukherjee 2020), we examine 26 ESG metrics discussed in the literature. We categorize 26 ESG industry-specific measures by industry to identify nonmaterial and material issues while adopting the classifications provided by the Sustainability Accounting Standards Board (SASB) and merge this dataset with financial statements data from Compustat. Our data reveals that firms tend to emphasize nonmaterial ESG factors more than material ESG factors.

We estimate a fixed-effects panel data model using a control function approach to address potential endogeneity and conduct several robustness checks. Our findings reveal a remarkable disparity in the effects of nonmaterial and material ESG factors on firm value. A 10% increase in emphasis on nonmaterial ESG factors leads to a decline in firm value by 10.7%. Conversely, a 10% increase in material

ESG emphasis results in a 4% increase in firm value, investor-facing information remains noisy but gradually evolving, suggesting increasingly sophisticated market responses to misaligned ESG emphasis. Additionally, we find that an increase of 10 percentage points in free cashflow strengthens the negative effect of nonmaterial ESG by 2.7%. In contrast, an increase of 10 percentage points in market share weakens the negative effect by 1.7%.

Finally, in support of our theoretical argument that nonmaterial ESG issues attract considerable media attention, we conducted a media mention analysis. Using media mention volume data from Truvalue Labs, we find that nonmaterial ESG emphasis is associated positively and significantly with the volume of media articles. In contrast, we found no significant impact on media mention volume associated with material ESG emphasis.

Our findings make several contributions to the growing field of ESG research and practice. First, our study presents the first empirical evidence that nonmaterial ESG emphasis is more prevalent than material ESG emphasis. Furthermore, we find that nonmaterial ESG emphasis has a significant negative impact on firm value, thus demonstrating the *materiality of nonmaterial ESG emphasis*. This implies that researchers and investors alike should avoid aggregating nonmaterial and material ESG factors into a single metric, as doing so will likely bias their results. Our findings also substantially advance executives' understanding of how emphasizing nonmaterial and material ESG factors differentially affects firm value.

Second, our empirical evidence challenges a fundamental assumption in ESG reporting: that industry-level materiality frameworks accurately capture ESG factors affecting firm value. Our research demonstrates that ESG factors currently classified as "nonmaterial" have significant impacts on firm value, revealing a critical blind spot in existing frameworks. These findings necessitate a fundamental reconsideration of how ESG materiality is defined and assessed. Policymakers must transition from static, industry-level materiality determinations to dynamic, evidence-based frameworks that capture all value-relevant factors. Executives could benefit from implementing a "dynamic materiality" framework that requires companies to report on a broader set of ESG metrics and justify any exclusions through

quantitative analysis. This approach would better serve investors while future-proofing ESG reporting against emerging sustainability risks and opportunities.

Third, our finding that the negative impact of nonmaterial ESG factors intensifies over time underscores the urgency for executives to take immediate action and reevaluate nonmaterial ESG emphasis. In addition, the association between increased free cash flow and the heightened negative effect of nonmaterial ESG provides evidence for the role of agency conflicts in this relationship. In contrast, the finding that a higher market share attenuates the negative impact of nonmaterial ESG factors on firm value highlights the importance of lowering information asymmetry between shareholders and managers.

Fourth, we find that nonmaterial ESG emphasis attracts three times more media attention compared to material ESG emphasis. However, shareholders may consider such attention to be strategically sought by executives in pursuit of their personal benefits, rather than solely for the firm's benefit. Regulatory bodies can use this insight to encourage transparency and accountability in ESG reporting. They may consider guidelines that emphasize the materiality of ESG factors and discourage tokenistic efforts by top managers that are primarily undertaken to attract media attention to themselves.

Finally, our findings enable executives to assess the impact of ESG factors on firm value and quantify the potential trade-offs between satisfying investor demands for material ESG performance and meeting the expectations of other stakeholders by emphasizing nonmaterial ESG factors. While the concept of ESG materiality primarily concerns investors, multiple other stakeholders, such as customers, employees, and regulators, may shape the firms' emphasis on ESG. To aid executives in assessing these trade-offs, we created an interactive web app (https://bit.ly/esg_app) mapping firms on their nonmaterial and material ESG emphasis. Our app also allows executives to assess and compare the performance impact of their current and potential future strategies involving changes in nonmaterial and material ESG emphasis.

2. Conceptual Framework

2.1 Nonmaterial ESG Emphasis and Firm Value

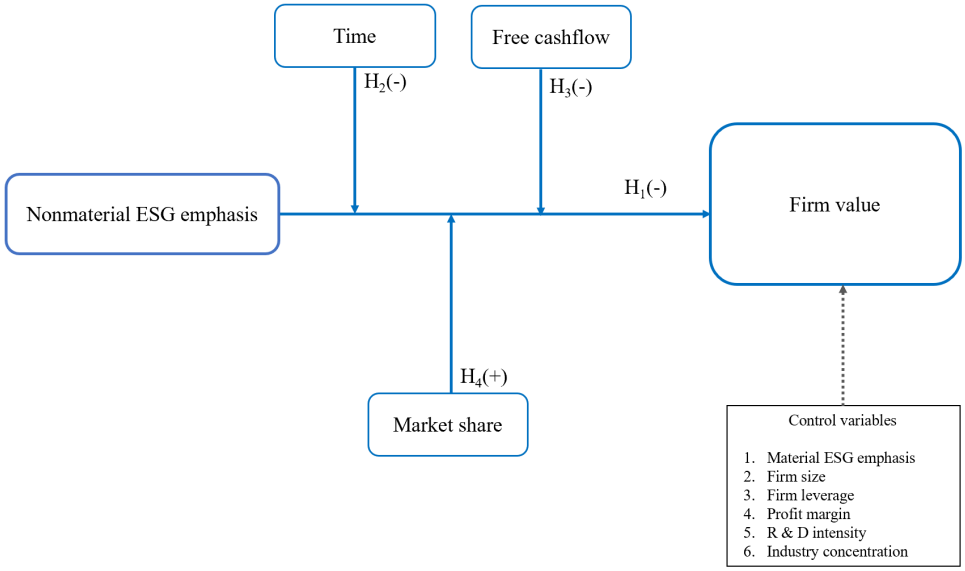
"If an issue is not material, its disclosure is at best a distraction for investors and issuers and at worst a time-consuming, expensive, legally perilous activity that is potentially detrimental to shareholders, the markets, and the economy as a whole" (Katz and McIntosh 2021).

The above quote underscores the importance of focusing on the materiality of firms' disclosures. Recent research has documented a positive impact of material ESG issues on a firm's financial performance (Khan et al. 2016, Steinbarth and Bennett 2018). For example, Khan et al. (2016) showed that firms with higher ratings on material ESG outperform those with lower material ESG ratings. Similarly, (Grewal et al. 2021) found that disclosing more SASB-identified material ESG topics is associated with higher stock price informativeness. (Serafeim and Yoon 2022, 2023) revealed that stock prices increase in response to positive news about material ESG issues. More recently, (Ahn et al. 2024) provided a fundamentals-based explanation of why firms with improved ratings on material ESG issues outperform their peers.

Despite the evident benefits of emphasizing material ESG issues, anecdotally we observe that firms also emphasize nonmaterial ESG issues. Moreover, we note that firms' emphasis on nonmaterial ESG factors in our dataset persists over time (Figure 3). This raises the question, "Why do some managers still prioritize nonmaterial ESG considerations?" We draw upon agency theory and propose that managers may accrue private benefits from nonmaterial ESG emphasis at the cost of shareholder value. Specifically, we argue that 1) self-interested managers may want to emphasize nonmaterial ESG because it gives them personal benefits such as media coverage at the cost of shareholders and 2) due to the information asymmetry between managers and shareholders, the shareholders cannot easily distinguish between nonmaterial ESG that the managers want to emphasize purely for personal benefits from the nonmaterial ESG that may lead to benefits to the firm. In contrast, as executives allocate resources to nonmaterial ESG factors, valuable focus and energy are diverted from critical areas driving financial

performance. This reallocation adversely affects overall firm performance and erodes shareholder value (Grewal et al. 2016). Figure 1 depicts our conceptual framework. Next, we explain these issues in more detail.

Figure 1. Conceptual framework.



2.2 Agency Costs of Nonmaterial ESG

Agency issues, also known as principal-agent problems, occur when the interests of the agent (such as a manager) diverge from those of the principal (such as a shareholder). This misalignment can lead to conflicts, inefficiencies, and potential losses for the principal, which are generally referred to as agency costs (Ross 1973, Jensen and Meckling 1976, Eisenhardt 1989). Agency costs are present across multiple domains, including finance (Fama 1980, Fama and Jensen 1983, Jensen 1986), accounting (Watts and Zimmerman 1983, Ronen et al. 1995), economics (Jensen and Meckling 1976, Ross 1973), and political science (Weingast and Moran 1983, Hammond and Knott 1996). In finance, for instance, fund managers might take excessive risks to achieve high returns and earn performance-based bonuses, potentially endangering the principal's investment.

Marketing researchers have used agency theory to explore various scenarios (Bergen et al. 1992, Logan 2000, Tate et al. 2010). For example, (Homburg et al. 2020) showed that how multichannel sales systems are set up affects conflicts between manufacturers and sales partners. Similarly, (Moon et al.

2023) used agency theory to explain how disclosing advertising spending can reduce analyst uncertainty, especially for companies facing higher agency costs due to more financial resources and lower financial leverage.

The manager-shareholder dynamic is a classic example highlighting agency issues, primarily due to the information asymmetry between them. Despite the theoretical premise that contracts between shareholders and managers should align the goals of principals and agents (Shapiro 2005, Tate et al. 2010), contracts often fall short for several reasons. First, shareholders, acting as principals, encounter a hidden action problem due to their inability to completely oversee the actions of managers (Bergen et al. 1992). This discrepancy arises because managers typically possess more comprehensive and up-to-date information regarding the company's operations and ESG initiatives compared to shareholders (DeLisle et al. 2021). For example, managers may strategically prioritize nonmaterial issues to deflect attention from their underperformance in material ESG issues (Grewal et al. 2016). Managers may pursue their own self-interest to the principal's detriment (i.e., acting opportunistically) by shirking or misrepresenting information (Bergen et al. 1992).

However, not all managers emphasize nonmaterial ESG due to self-interest. In many firms, shareholders expect managers to engage in ESG activities even though these activities may not lead to positive cashflows. For example, so-called "B Corporations" emphasize ESG factors deemed important by the certifying agency B Lab, which measures a company's ESG performance against the standards in the B Impact Assessment. Thus, managers of B Corporations may undertake nonmaterial ESG not due to self-interest but because the shareholders demand it. Accordingly, although shareholders may want to limit their firm's nonmaterial ESG emphasis, they may not want to eliminate it. Moreover, shareholders are not a single homogenous block of individuals with the same interests. For instance, whereas some shareholders may want managers to emphasize nonmaterial ESG such as charities, other shareholders may want them to emphasize other philanthropies. As managers usually control the selection and execution of a firm's ESG activities, shareholders may find it difficult to distinguish between nonmaterial

ESG that managers emphasize due to self-interest and nonmaterial ESG that managers emphasize to fulfill shareholder objectives. The divergence between shareholder objectives and managerial actions results in agency costs.

Second, there is an inherent conflict of goals between managers and shareholders. Managers often focus on their individual gains, such as meeting quarterly earnings targets, while shareholders assess whether managerial actions maximize long-term shareholder wealth (Healy and Palepu 2001, Graham et al. 2005). For instance, managers may reduce investments in projects with long-term value to meet short-term targets.

Based on this discussion, we argue that managers may emphasize some nonmaterial ESG initiatives that provide immediate personal reputational benefits or meet short-term objectives, even if these initiatives do not contribute to long-term shareholder value. Nonmaterial ESG factors, like social activism and charitable contributions, frequently attract substantial media coverage. Positive media coverage of a company's ESG initiatives can enhance a manager's personal reputation, even if these initiatives do not contribute to shareholder value (Menicacci and Simoni 2024). For example, a manager might launch a high-profile environmental initiative, such as a tree-planting campaign (nonmaterial ESG, which might be seen as "exciting"), that generates positive media coverage and enhances their personal reputation. However, this initiative might not contribute to the company's financial performance. Furthermore, nonmaterial ESG emphasis may create distractions for managers, resulting in suboptimal performance. For example, (Cline et al. 2018) argue that CEOs getting distracted due to their indiscretions may not optimally allocate their time for value-enhancing activities. Consequently, the pursuit of positive media coverage can divert managerial focus away from value-maximizing activities and toward superficial gestures that do not necessarily translate into tangible benefits for shareholders (Ocasio and Joseph 2005).

On the other hand, some material ESG factors such as an initiative to improve a company's energy efficiency might not generate much media attention but could reduce costs and increase

shareholder value.[3] Research suggests that managers who prioritize stakeholder value over shareholder value, especially when struggling to meet earnings expectations, do so for job security (Flugum and Souther 2023).

This discussion suggests that nonmaterial ESG emphasis will incur agency costs (Ioannou and Serafeim 2015), and lower firm value. Accordingly, we hypothesize:

H_1: *Nonmaterial ESG emphasis has a negative impact on a firm's value.*

Next, we investigate three constructs that may moderate the relationship between nonmaterial ESG and firm value.

2.3 Moderating Role of Time

Over time, shareholders become more aware of the costs associated with nonmaterial ESG emphasis. These costs were less apparent when the distinction between nonmaterial and material ESG was less pronounced. However, the emerging popularity of frameworks such as SASB[4] is making the differentiation between nonmaterial and material factors more evident. Figure 2 shows the increasing Google search trend for SASB,[5] indicating the increasing awareness of materiality of ESG issues. In the early days of ESG, many shareholders may not have distinguished between nonmaterial and material ESG, assigning similar positive weight to both. As shareholders become more aware of the concept of ESG materiality, they are more likely to recognize nonmaterial ESG emphasis and penalize firm value accordingly. Therefore,

H_2: *The negative impact of nonmaterial ESG emphasis on a firm's value becomes stronger with time.*

2.4 Moderating Role of Free Cashflow

[3] Energy management is a material ESG issue for several industries such as E-Commerce and Software & IT services. For more details, please see https://sasb.ifrs.org/standards/materiality-finder/find/?industry%5B0%5D=TC-SI

[4] We provide more details about SASB in the Methodology section below.

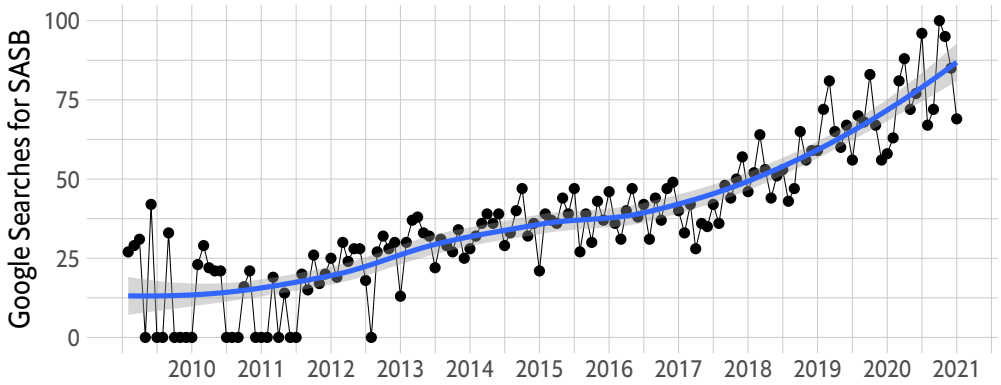
[5] Trends data is an unbiased sample of Google search data. It shows how frequently a specific search term is entered into Google's search engine relative to the total search volume over a given period.

Free cashflow is defined as "the cash in excess of that required to fund all positive net present value projects" (Malshe and Agarwal 2015). Jensen (1986) argues that agency costs are likely to be higher for firms with higher free cashflow as managers may spend the cash on activities that do not benefit the shareholders. For example, managers may spend a firm's money to obtain perquisites such as private jets and expensive club memberships, or to increase the size of their staff. In the extreme, managers may even undertake value-reducing mergers and acquisitions, engaging in empire-building. On the other hand, managers committed to maximizing shareholder wealth often consider returning free cashflow to shareholders in the form of dividends or share repurchases. However, managers exercise considerable discretion on how to spend their firm's free cashflow. Additionally, managers have full control over the assumptions made to calculate the net present value of projects, making it difficult for shareholders to ascertain the level of wasteful spending by managers.

Thus, in the presence of free cashflow, self-interested managers are more likely to have the opportunity to use the funds to emphasize nonmaterial ESG that benefit themselves at the cost of shareholders, exacerbating the agency costs. Therefore, we hypothesize the following:

H_3: *The negative impact of nonmaterial ESG emphasis on firm value is stronger for firms with higher free cashflow.*

Figure 2. Increasing Google search trend for SASB



2.5 Moderating Role of Market Share

There are two reasons why firms with higher market share are likely to have lower agency costs. First, a larger market share often indicates a more dominant position in the industry, leading to a less complex and more predictable operating environment (Messersmith et al. 2014). As such, shareholders and analysts of high market share firms find it easier to assess managerial actions because the company's performance is more closely tied to its market dominance. Second, companies with higher market share face increased scrutiny due to their ability to influence prices, product availability, and competitive dynamics (Eckard Jr 1982). Regulators monitor high market share firms to prevent anticompetitive behavior (Wörsdörfer 2022). This scrutiny aids in lowering information asymmetry between managers and shareholders about managerial actions through improved monitoring, thereby reducing agency costs. In other words, greater market share provides more visibility to shareholders into firms' actions and reduces the likelihood of agency conflicts, ultimately leading to lower agency costs. In contrast, firms with a lower market share tend to receive less scrutiny, making their operations opaque to shareholders and potentially increasing agency costs. Therefore, nonmaterial ESG emphasis by high (low) market share firms is less (more) likely to raise shareholder concerns about agency costs. Accordingly,

> H_4: *The negative impact of nonmaterial ESG emphasis on firm value is weaker for firms with higher market share.*

3. Methodology

3.1 Nonmaterial ESG: SASB Framework

A fundamental distinction in our research framework lies in the categorization of ESG factors as either "material" or "nonmaterial." ESG factors are nonmaterial, or material based on whether their inclusion or exclusion from corporate disclosures significantly alters the overall information available to a reasonable investor (Lee 2021). This delineation becomes pivotal in understanding the interplay between ESG emphasis and its effect on firm value. However, understanding material or nonmaterial ESG for a specific

company can be a complex task because materiality varies across industries. For instance, in some industries such as biofuels or forestry, ESG risks pertain to air quality, wastewater management, and climate change. In contrast, in other sectors such as consumer goods, ESG risks pertain to supply chain management, material sourcing, and product quality and safety.[6] The TSC Industries v. Northway case (1976) established the materiality standard for securities fraud cases. According to this standard, an omitted fact is material if it would significantly impact a reasonable shareholder's voting decision. Transparency and accurate disclosures in proxy statements are crucial to informed shareholder choices.

Third-party classifications such as SASB have established frameworks to distinguish between nonmaterial and material ESG issues. SASB standards aim to identify issues that could significantly affect a company's financial performance, making them highly relevant for investors. Moreover, SASB's framework aligns with the materiality standard established by the U.S. Supreme Court in the TSC Industries versus Northway Inc. case (1976), providing a solid legal foundation. The widespread adoption of SASB metrics further underscores its importance in the market, with the number of companies disclosing material SASB metrics surging from 117 in 2019 to 2,231 by the end of 2022 (Ahn et al. 2024). This adoption highlights SASB's role as a coordinating entity and its impact on establishing a common language for sustainability reporting. Recently, SASB merged with the International Sustainability Standards Board (ISSB), which has confirmed that its standards will mandate industry-specific disclosures, further emphasizing the relevance of the SASB's standards. In the absence of specific International Financial Reporting Standards (IFRS), companies are encouraged to consider SASB Standards for identifying sustainability-related risks, opportunities, and metrics. Adopting SASB Standards positions preparers favorably for the future application of IFRS Sustainability Disclosure Standards. Leading international investors endorse SASB Standards as a fundamental way for companies to communicate industry-based sustainability information.[7] Furthermore, prior ESG studies have also

[6] https://sasb.ifrs.org/standards/materiality-finder/find/
[7] See https://sasb.org/investor-use/supporters/

leveraged SASB's framework to identify materiality of ESG issues(Khan et al. 2016, Consolandi et al. 2020, Ahn et al. 2024). Accordingly, we use SASB's industry categorization map, which covers 77 industries across 10 sectors. This map serves as a reference for determining materiality.

3.2 Data

Our primary independent variable is ESG emphasis. We extracted firms' ESG emphasis from earnings call transcripts. We specifically chose to analyze earnings call transcripts because they provide firsthand ESG information, allowing firms to demonstrate their commitment to ESG and provide investors with a comprehensive understanding of their ESG strategy (Eccles and Serafeim 2013). During these calls, firms disclose a substantial amount of information, often going beyond required disclosures found in formal reports or public statements (e.g., (Brown et al. 2004). Furthermore, earnings calls include a question-and-answer section where financial analysts covering the firm get to ask questions to the firm's top management. As each analyst can typically ask only one main and one follow-up question, they are much more likely to ask questions that they believe are crucial for the firm's valuation. Thus, analysts asking questions about ESG are likely to underscore the firm's ESG emphasis.

We obtain conference call transcripts from the Wharton Research Data Services (WRDS) spanning 2005 and 2021 across 77 SASB industries.[8] We include all the transcripts available for a firm in any given year and analyze 10,142,523 sentences individually to identify the presence of 26 ESG factors. For firm financials, we used S&P's annual Compustat database. We identified nonmaterial and material factors for a given industry using the SASB materiality map (see Web Appendix A). Our final sample consists of 5,079 firms and 44,570 firm-year observations over 17 years.

3.3 Measures

Focal independent construct. Our focal independent variable is nonmaterial ESG emphasis. We extract the nonmaterial emphasis from the text of earnings call transcripts using a transformer-based model called ESG-BERT (Mukherjee 2020). ESG-BERT has been fine-tuned on ESG-related corpora to capture the

[8] Conference call transcript availability is limited before 2005 (Price et al. 2012).

relevant context, achieving 100% and 98% accuracy on next-sentence prediction and masked language modeling tasks, respectively, and an F1 score of 0.90, substantially outperforming general BERT (0.79) and traditional machine learning models (0.67). Using ESG-BERT, we extracted 26 ESG metrics (see Web Appendix A) and classified them as material or nonmaterial based on SASB industry mapping. To further validate model's classification reliability, we conducted (1) human validation on 570 randomly selected sentences (88.42% accuracy) and (2) AI validation using Anthropic's Opus model across four ESG categories (83.33% accuracy). Computations were performed on Google Colab Pro+, requiring approximately four months due to data scale. Sentence-level classifications were aggregated to the firm-quarter level, producing ESG disclosure scores that capture managerial emphasis.[9]

The SASB categorizes the 26 standard ESG factors as nonmaterial or material for each industry, which formed the basis of our independent variables. We create materiality and nonmateriality scores for each firm-year individually for 26 ESG factors.[10] To calculate nonmaterial and material ESG emphasis, we assess the proportion of sentences in a firm's transcripts (in a specific industry) in a given year that pertain to nonmaterial and material factors. This calculation considers the total number of sentences across all the transcripts of that firm for that year. Previous studies have primarily used word-counting techniques to analyze corporate disclosures (Yadav et al. 2007, Saboo and Grewal 2013, Huang et al. 2020, Vadakkepatt et al. 2022). However, these methods may not effectively interpret earnings call data given variations in company discussions. Dictionary-based approaches fail to consider context and meaning. For example, mentioning the word "environment" does not guarantee a focus on a particular ESG factor.

To overcome these limitations, we use a transformer-based deep-learning model that captures context and nuances of the ESG factors. This model classifies sentences based on the presence of 26 specific ESG factors, assigning a 1 or 0 accordingly. By comparing the number of sentences addressing

[9] Sample sentence classifications are provided in Web Appendix A, Table A3.
[10] We include the material score as a control variable in our estimation.

nonmaterial and material ESG issues with the overall sentence count, we derive the nonmaterial and material ESG emphasis, providing insights into the relative significance of these issues within the specific context of the transcripts. For firm *i* in year *t*, we calculate the nonmaterial ESG emphasis as follows:

$$Nonmaterial\ ESG\ emphasis(i,t) = \frac{\text{Sum of sentences } with \text{ nonmaterial ESG factors}}{Total\ sentences}. \quad (1)$$

For a firm *i* in year *t*, we calculate material ESG emphasis as follows:

$$Material\ ESG\ emphasis(i,t) = \frac{\text{Sum of sentences with material ESG factors}}{Total\ sentences}. \quad (2)$$

Focal dependent variable: Total q. Following previous research (Du and Osmonbekov 2020, Edeling et al. 2021) we use Total q developed by (Peters and Taylor 2017) as a measure of firm value. It accounts for intangible capital in the denominator as the sum of so-called knowledge capital (based on R&D expenditures) and organization capital (based on selling, general, and administrative expenditures). As the numerator of Total q is similar to that of Tobin's q, it provides similar benefits associated with Tobin's q identified by(Wernerfelt and Montgomery 1988): 1) it implicitly uses correct risk-adjusted discount rate, 2) imputes equilibrium returns, and 3) minimizes distortions due to tax laws and accounting conventions. Furthermore, similar to Tobin's q role as a measure of growth options (Cao et al. 2008), Total q is also likely to capture the value of growth options, which are crucial indicators of firm performance.

Moderating variable: Free cashflow. Based on previous literature (e.g., Ferrell et al. 2016), we use the free cashflow measured by net cashflow from operating activities scaled by total assets.

Moderating variable: Market share. Based on previous literature (e.g., Anderson et al. 2004), we compute the firm's market share as the firm's sales as a percentage of the total industry sales based upon the 4-digit Standard Industrial Classification (SIC) code.

Moderating variable: Time elapsed. To calculate time elapsed, we use an increasing counter variable with the value 0 for the year 2005 incrementing by 1 through 2021. The variable has a value of 16 for year 2021.

Control variables. We incorporate various control variables to mitigate potential alternative explanations for our findings. We include *firm size*, represented by the natural logarithm of total sales (Rouziès et al. 2009) and *firm leverage*, calculated as the ratio of a firm's total debt to the sum of total debt and market value of equity (Malshe and Agarwal 2015). Firm leverage helps address the influence of a firm's financial structure on its ability to invest in material ESG factors. To control for profitability and innovation, we include the variables *profit margin* and *R&D intensity*, respectively (Malshe and Agarwal 2015).

Furthermore, we include *industry concentration* as control variable, as it is associated with firm value. Following prior work (Luo et al. 2010), we operationalize industry concentration using the Herfindahl–Hirschman index (HHI). A lower HHI suggests a more fragmented industry with many competitors, while a higher HHI indicates concentration among a few large firms. To address year-specific effects that may not be observable, we incorporate year fixed effects. These capture any unobservable time trends that may affect the outcomes. Finally, we also control for firm's material ESG emphasis, as it can influence a firm's nonmaterial ESG emphasis. We compute it based on equation (2).

Table 1 summarizes all our measures and control variables. Figure 3 depicts the temporal variation in both nonmaterial and material ESG emphasis. Nonmaterial ESG receives notably greater emphasis compared to material ESG across companies. A notable surge in nonmaterial ESG emphasis is evident around 2019-2020 (Figure 3), coinciding with significant events like the emergence of stakeholder capitalism discussions at Business Roundtable in 2019,[11] and at Davos in 2020.[12] Figure 4 highlights sector-specific variations, with Infrastructure and Services exhibiting high asymmetry and

[11] https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans

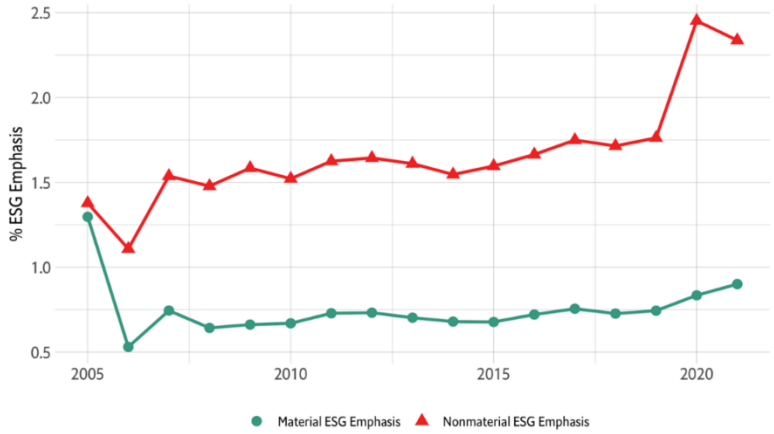
[12] https://www.weforum.org/press/2019/10/world-economic-forum-50th-annual-meeting-in-davos-defining-stakeholder-capitalism/

Technology and Communications showing a more balanced emphasis. Figures 5A, 5B, and 5C show company-specific ESG emphasis over time, illustrating face validity of our measures. For example, Nike's surge in nonmaterial ESG emphasis around 2018 aligns with its Colin Kaepernick "Just Do It" Campaign (Figure 5A). In contrast, Microsoft has maintained a consistent track record in both nonmaterial and material ESG issues (Figure 5B). With a legacy steeped in corporate social responsibility and ESG practices, Microsoft has set a pioneering example by establishing a comprehensive environmental policy early on and maintaining its leadership in sustainable business practices for over two decades.[13] Similarly consistent material emphasis from Bank of America (see Figure 5C) echoes their CEO's statement that "we are capitalists" .[14]

However, the recent increase in nonmaterial ESG emphasis also coincides with the criticism from Republican politicians who argue that Bank of America emphasizes nonmaterial ESG (climate change, and workforce diversity) over shareholder returns (Schroeder et al. 2022).

Table 2 shows the descriptive statistics and correlations for the focal and control variables. We include an extensive set of control variables to account for the variations of firm value due to the observed firm and industry variables (Germann et al. 2015).

Figure 3. Material and Nonmaterial ESG Emphasis Over Time in Earnings Call



[13] https://www.etftrends.com/esg-channel/esg-in-action-a-conversation-with-microsoft-and-the-environmental-defense-fund/
[14] Schroeder P, Nguyen L, Azhar S (2022) Republicans Warn Bank CEOs to Steer Clear of Social, Cultural Issues.

Table 1. Measures and Data Sources

Variable	Definition	Data Source	Supporting Literature
Dependent Variable			
Firm value (Total q)	Firm's stock of tangible and intangible assets by capturing the relationship between the replacement cost of a firm's tangible assets and the market value of the firm	Compustat	Peters and Taylor (2017)
Focal Intendent Variables			
Nonmaterial ESG emphasis	Ratio of nonmaterial ESG sentences to total sentences	Earnings call transcripts	This study
Moderating Variables			
Time elapsed	Number of years since beginning of the sample (2005 = 0)	Our data	Gretz et al. (2019)
Market share	Market share of the firm	Compustat	Anderson et al. (2004)
Free cashflow	Firm's cash flows scaled by total assets	Compustat	Malshe and Agarwal (2015)
Control Variables			
Industry concentration	HHI	Compustat	(Luo et al. 2010)
Material ESG emphasis	Ratio of material ESG sentences to total sentences	Earnings call transcripts	This study
Firm size	Natural logarithm of the total sales	Compustat	Rouziès et al. 2009
Advertising intensity	Advertising spending divided by total sales	Compustat	Malshe and Agarwal (2015)
R&D intensity	R&D spending divided by total sales	Compustat	Malshe and Agarwal (2015)
Profit margin	Ratio of operating income before depreciation to total assets	Compustat	Malshe and Agarwal (2015)
Market leverage	Firm's total debt divided by the sum of total debt and market value of firm	Compustat	Malshe and Agarwal (2015)

Table 2. Descriptive Statistics and Correlations

Variables	N	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Material ESG Emphasis	44,570	0.01	0.01	1.00									
(2) Nonmaterial ESG Emphasis	44,570	0.02	0.02	0.32***	1.00								
(3) Firm Value	44,570	1.59	1.64	0.03***	-0.04***	1.00							
(4) Firm Leverage	44,570	0.24	0.23	-0.05***	0.02***	-0.41***	1.00						
(5) Time Elapsed	44,570	9.11	4.27	0.07***	0.15***	0.08***	0.05***	1.00					
(6) Cash Flow	44,570	0.06	0.17	-0.12***	-0.10***	-0.01	-0.02***	-0.07***	1.00				
(7) Profit Margin	44,570	0.07	0.19	-0.15***	-0.10***	-0.03***	0.01	-0.08***	0.88***	1.00			
(8) Firm Size	44,570	6.84	2.22	-0.18***	-0.21***	-0.17***	0.26***	0.03***	0.42***	0.47***	1.00		
(9) Industry Concentration	44,570	0.23	0.20	-0.08***	0.02***	0.02***	-0.08***	0.02***	0.04***	0.08***	0.04***	1.00	
(10) Market Share	44,570	0.09	0.19	-0.12***	-0.05***	-0.04***	0.05***	0.01***	0.11***	0.15***	0.39***	0.57***	1.00
(11) R&D Intensity	44,570	2.33	100.40	0.01***	0.003	0.03***	-0.02***	0.01	-0.09***	-0.09***	-0.11***	-0.01**	-0.01**

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Figure 4. Material and Nonmaterial ESG Emphasis for Various SASB Sectors

Figure 5A. Material and Nonmaterial ESG Emphasis for Nike

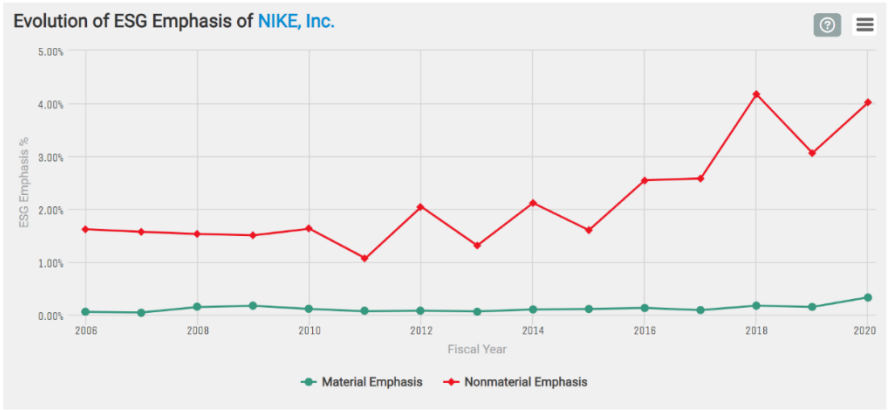


Figure 5B. Material and Nonmaterial ESG Emphasis for Microsoft

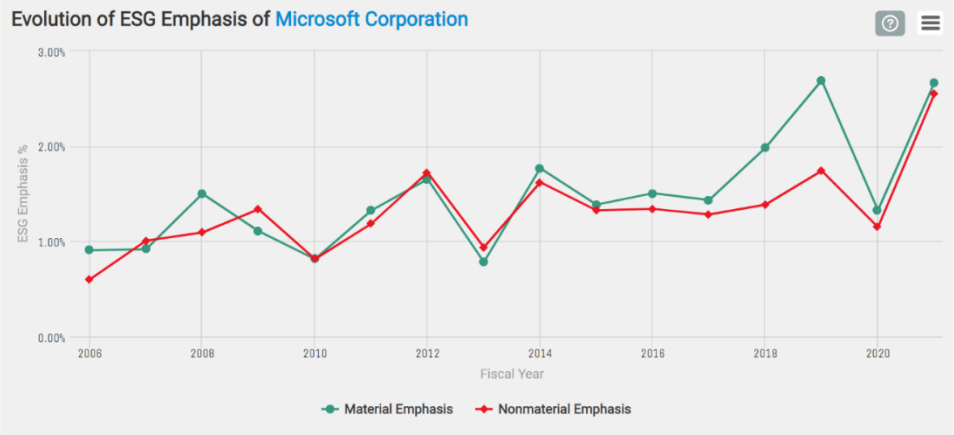
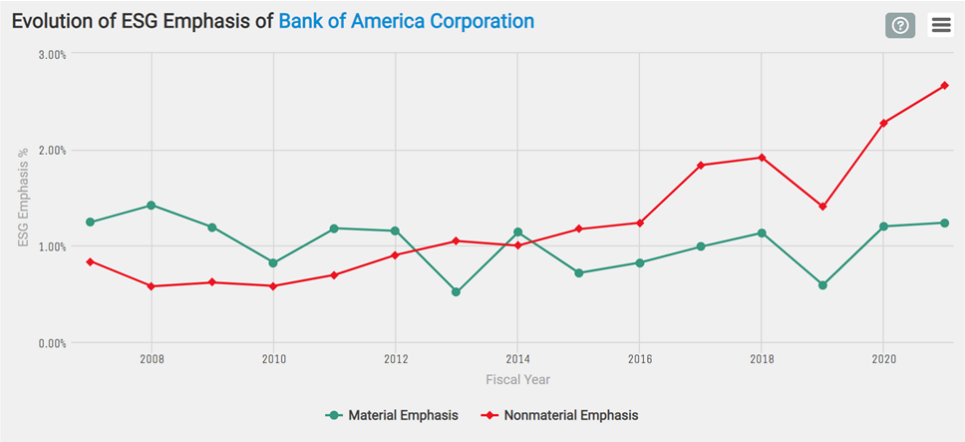


Figure 5C. Material and Nonmaterial ESG Emphasis for Bank of America



4. Addressing Potential Endogeneity

Firms' emphasis on material or nonmaterial ESG factors is potentially endogenous because managers may strategically plan and emphasize these factors, as they signal volatility and risk for firms (Eccles et al. 2017). In addition, the Securities and Exchange Commission's failure to incorporate sustainability factors into its interpretation of materiality leaves firms to emphasize ESG factors at their own discretion, which makes our main independent variables potentially endogenous.

Therefore, we use the control function approach to address potential endogeneity (Malshe et al. 2020). We introduce two new variables, corresponding to nonmaterial and material ESG emphasis, and label them as control function corrections in Equation 3. Conditional on control functions corrections, independent endogenous variables should be uncorrelated with the error terms. Following previous research (Sridhar et al. 2016, Malshe et al. 2020), we followed a two-step methodology.

First, we regressed nonmaterial and material ESG emphasis on a set of predetermined control variables and instruments. We use the average nonmaterial and material ESG emphasis of peer firms as instruments for nonmaterial and material ESG emphasis for the focal firms, respectively (Sridhar et al. 2016). Peer firms are sample firms that operate in the same primary two-digit SIC codes as the focal firms for inclusion in our sample (Germann et al. 2015).

Scholars have emphasized two key criteria when using instruments. First, the instruments should be relevant, meaning that they are conceptually related to the endogenous independent variables. Second, the instruments should meet the exclusion criteria, indicating that they should not have any impact on the dependent variable when considering the endogenous independent variables. Following prior research that uses peer instruments to meet both relevancy and exclusion criteria (Germann et al. 2015) we propose to use peer firms' ESG emphasis as instruments. In terms of relevancy, we maintain that both focal and peer firms operate in the same industries, encountering comparable market conditions. This alignment guarantees that the instrument used remains pertinent and applicable to the focal firms. For exclusion, the probability of our instrument being associated with omitted variables specific to the focal firms, such as organizational culture, is low. The complexity of evaluating such variables, combined with the challenges of managing collective action, means that they are unlikely to be related to our instrument (Germann et al. 2015). Consequently, our instrument satisfies the exclusion restriction. Specifically, we estimate the following auxiliary regressions:

$$\mathrm{ESGNONMAT}_{i,t} = \theta_0 + \tilde{\theta}\mathrm{CTRL}_{i,t} + \theta_1 \mathrm{PEER\_ESGNONMAT}_{i,t} + \theta \sum \mathrm{YDUMMY}_{i,t} + \mathrm{CF\_NONMat}_{i,t} \quad (3a)$$

$$\text{ESGMAT}_{i,t} = \mu_0 + \tilde{\mu}\text{CTRL}_{i,t} + \mu_1\text{PEER\_ESGMAT}_{i,t} + \mu\sum\text{YDUMMY}_{i,t} + \text{CF\_Mat}_{i,t} \quad (3b)$$

where, for focal firm *i* in year *t*, $PEER\_ESGNONMAT_{i,t}$ is the average emphasis on nonmaterial ESG of peer firms and $PEER\_ESGMAT_{i,t}$ is the average emphasis on material ESG of peer firms. We use the estimated error terms $\text{CF\_}Mat_{i,t}$ and $\text{CF\_}NonMat_{i,t}$ as control function corrections.

4.1 Model Specification and Estimation

To examine the impact of nonmaterial ESG on firm value and the moderating role of time, free cashflow, and market share, we define our empirical model using Equation 4:

$$\text{Firm Value}_{i,t+1} = \beta_0 + \beta_1\text{NonmatESG}_{i,t} + \beta_2(\text{Cashflow}_{i,t}\ \text{X Esg Nonmat}_{i,t}) +$$

$$\beta_3(\text{Time Elapsed}_{i,t}\ \text{X Esg Nonmat}_{i,t}) + \beta_4(\text{Market Share}_{i,t}\ \text{X Esg Nonmat}_{i,t}) + \beta_5\text{CF\_Mat}_{i,t} +$$

$$\beta_6\text{CF\_Nonmat}_{i,t} + \tilde{\beta}\text{CTRL}_{i,t} + \beta\sum\text{YDUMMY}_{i,t} + \varepsilon_{i,t+1} \quad (4)$$

where, for each firm *i* and year *t*, *Firm Value*$_{it}$ is the natural log of Total q, *Nonmat Esg*$_{it}$ is the natural log of nonmaterial ESG emphasis, *Time_Elapsed*$_{it}$ is an increasing counter with the value 0 for the year 2005 incrementing by 1 through 2021, $CTRL_{i,t}$ represents all the control variables, $\text{CF\_}Mat_{i,t}$ and $\text{CF\_}NonMat_{i,t}$ are control function corrections to account for endogeneity due to omitted variables, and $YDUMMY_{i,t}$ is a set of year-dummy variables that capture time variation in firm value.

5. Results

In Column 1, Table 3, we report the results of Model 1 which does not include interaction effects of moderating variables. It includes nonmaterial ESG emphasis and controls and serves as a baseline. Model 2 adds the interaction terms to Model 1 and is our full model.

Test of hypotheses. In Column 2, Table 3, we report the results of Model 2. We use the results from this model to test all the hypotheses. We find that the coefficient of nonmaterial ESG emphasis is negative and significant (1.074, $p < 0.01$). Thus, we find support for H_1. The interaction of nonmaterial ESG emphasis with time is negative and significant (–0.008, $p < 0.01$), which supports H_2.

H_3 posits that the negative impact of nonmaterial ESG emphasis on firm value becomes stronger for firms with higher free cashflow. The results show that the interaction effect of nonmaterial ESG emphasis and free cashflow is negative and significant (-0.271, $p < 0.01$).

Table 3. Association of Nonmaterial ESG and Firm Value

	Main Effects (1) Firm Value $_{t+1}$		Main Model (2) Firm Value$_{t+1}$	
Nonmaterial ESG emphasis$_t$	-1.000***	(0.304)	-1.074***	(0.304)
Nonmaterial ESG emphasis$_t$ x time elapsed$_t$			-0.008***	(0.003)
Nonmaterial ESG emphasis$_t$ x free cashflow$_t$			-0.271***	(0.095)
Nonmaterial ESG emphasis$_t$ x market share$_t$			0.165**	(0.067)
Material ESG emphasis$_t$	0.378*	(0.195)	0.399**	(0.194)
Time elapsed$_t$	-0.024*	(0.012)	-0.060***	(0.018)
Free cashflow$_t$	0.084	(0.101)	-0.985**	(0.407)
Market share$_t$	-0.174	(0.120)	0.520*	(0.311)
Firm leverage$_t$	-0.833***	(0.068)	-0.807***	(0.068)
Profit margin$_t$	0.382***	(0.089)	0.399***	(0.088)
Firm size$_t$	-0.090**	(0.036)	-0.100***	(0.035)
R&D intensity$_t$	-1e-04	(9e-05)	-1e-04	(9e-05)
Industry concentration$_t$	0.166	(0.139)	0.168	(0.138)
Control function: nonmaterial ESG emphasis$_t$	0.943***	(0.303)	1.013***	(0.303)
Control function: material ESG emphasis$_t$	-0.374*	(0.195)	-0.394**	(0.194)
Constant	-1.117	(1.585)	-1.237	(1.582)
No. of Obs.	38,498		38,498	
R-square	0.050		0.052	
Year fixed effects	Yes		Yes	
Firm fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Moderating variables time elapsed, free cashflow, and market share are mean centered.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

The negative interaction effect of nonmaterial ESG emphasis and free cashflow suggests that free cashflow strengthens the negative impact of nonmaterial ESG emphasis on firm value, in support of H_3. Similarly, we find that the interaction effect of nonmaterial ESG emphasis and market share on firm value is positive and significant (0.165, $p < 0.05$), in support of H_4.

The effects of control variables are generally in the expected directions. First, the coefficient of material ESG emphasis is positive and significant (0.399, $p < 0.05$). Financial leverage (-0.807, $p < 0.01$)

and firm size (-0.100, $p < 0.01$) have significantly negative impacts on Total q. Finally, we find a positive effect of profitability (0.399, $p < 0.01$).

All the other control variables are nonsignificant. We also conducted the Johnson-Neyman analysis for all three of our moderating variables. Our findings are depicted in Figure 6. Panel A, B, and C show the Johnson-Neyman plots for time, free cashflow, and market share, respectively. Neither Panel A nor Panel C have Johnson-Neyman points, suggesting that for our sample's range of values, the effects of time (market share) on the association between nonmaterial ESG emphasis and firm value are uniformly negative (positive).

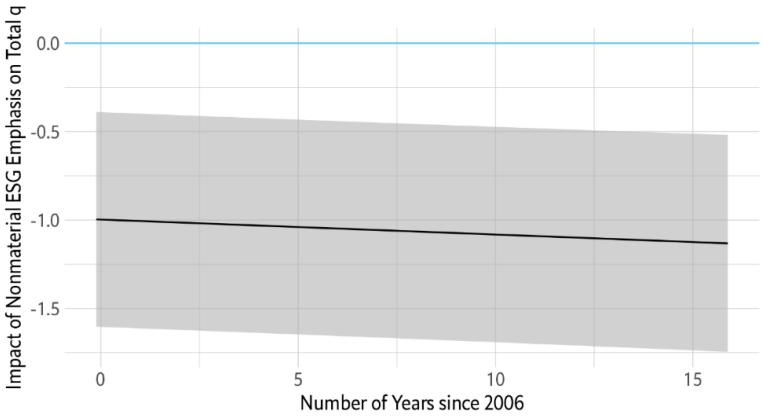
The shaded region represents a 95% confidence interval band. Similarly, Panel B illustrates the association between nonmaterial ESG and firm value for different values of free cashflow. This association becomes negative at high values of free cashflow (beyond -1.4).

6. Media Mention Analysis.

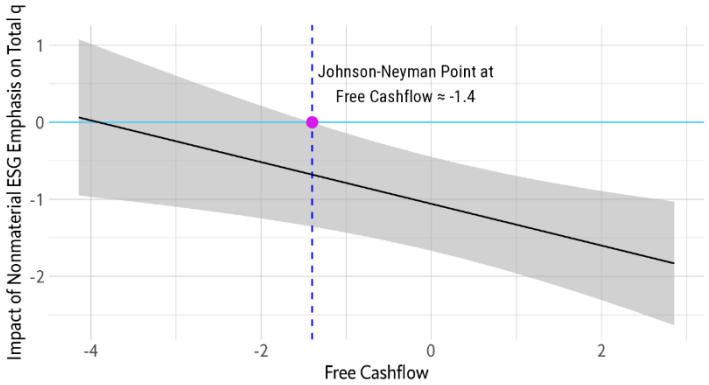
To examine whether managers receive more media attention by emphasizing nonmaterial ESG factors, we utilize data on ESG-related news volume sourced from TruValue Labs. TruValue Labs, an AI-driven provider of corporate ESG data and analytics, monitors ESG news and events across 13 languages from over 100,000 diverse sources, including news articles, analyst reports, trade journals, industry publications, watchdog groups, and social media. Offering an external perspective, TruValue Labs tracks both positive and controversial ESG news of firms and is frequently employed in academic research (e.g., (McGlinch and Henisz 2020, Serafeim and Yoon 2022), Malshe et al. 2023). We use the total ESG news volume as our dependent variable. Total ESG news volume shows an increasing trend for a majority of sample firms suggesting serial dependence. Therefore, we include the lag of total ESG news volume as a control variable in the model.

Figure 6. Johnson–Neyman analysis for the Moderating Effect of Time, Free cashflow, and Market share

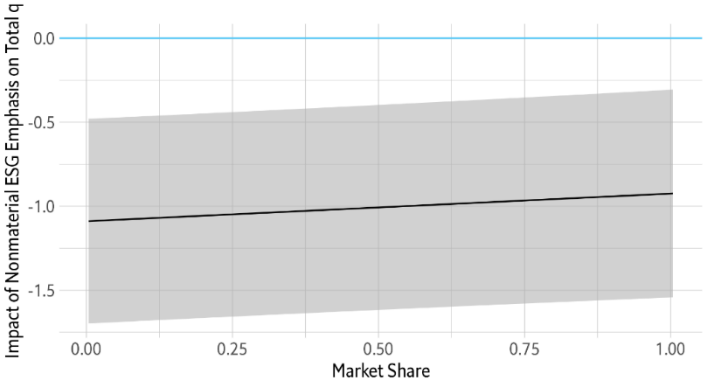
Panel A



Panel B



Panel C



As this makes our model a dynamic panel model (see Eq 5) we estimate it using the generalized method of moments (GMM).

$$\text{ESG news volume}_{i,t} = \pi_0 \text{ESG news volume}_{i,t-1} + \pi_1 \text{Nonmaterial ESG emphasis}_{i,t} + \pi_2 \text{Material ESG emphasis}_{i,t} + \tilde{\pi}\text{Controls}_{i,t} + \pi \sum \text{Year Dummies}_{i,t} + u_{i,t} \quad (5)$$

We adopt the system GMM approach, employing moment conditions where lagged values of the dependent variable and the first differences of exogenous variables serve as instruments for the first-differenced equation. Additionally, we utilize moment conditions, where lagged first differences of the dependent variable act as instruments for the level equation. This method is implemented using the xtabond2 procedure in Stata (Roodman 2009).

To assess the robustness of our model and ensure adherence to model assumptions, we conduct several diagnostic tests. First, we check for autocorrelation in the first-differenced errors and find no evidence of autocorrelation in the errors (p = 0.104 Arellano-Bond test for AR(2)). For accurate estimation using system GMM, it is essential that the error term u_{it} is devoid of higher order autocorrelation. Consequently, even if u_{it} shows no serial correlation, changes in u_{it} (Δu_{it}) will be correlated with the lagged changes (Δu_{it} −1) since both include u_{it} −1. However, it is crucial that $\Delta\ u_{it}$ is not correlated with $\Delta\ u_{it}$ −k for $k \geq 2$. This hypothesis can be assessed through the Arellano-Bond autocorrelation test. The null hypothesis, indicating no serial correlation in the error terms, should be rejected only for the first lag, not for subsequent lags (Arellano and Bond 1991). Second, we check if overidentifying restrictions are valid, meaning that the additional instruments are not correlated with the error term in the regression equation. We conduct the Hansen-J (1982) test to check the validity of the overidentifying restrictions (moment conditions) and find that the additional instruments are jointly valid (Hansen-J test: chi2(77) = 59.26, p = 0.933). We also control for market share, firm size, and firm profitability that can significantly drive media attention for the firms.

6.1 Results

In Column 1, Table 4, we report the results of Model 1 which uses the Total ESG news volume as a dependent variable. It includes news volume of both nonmaterial and material ESG. We find that nonmaterial ESG emphasis has a positive and significant impact on total ESG related news volume for a firm (133,615.71, $p < 0.05$). In contrast, material ESG emphasis has no significant impact on total ESG related news volume. Notably, the coefficient for nonmaterial ESG suggests that it drives nearly three times as much news volume for firms compared to material ESG (133,615.71 for nonmaterial vs. 31,842.32 for material).

To further test the robustness of our analysis, we also control for the advertising intensity. We constructed an estimated advertising intensity for each firm, following prior research (Malshe and Agarwal 2015). For each firm that reports advertising, we computed the ratio of advertising to selling, general, and administrative expenses (SG&A) each fiscal year. Next, we obtained the yearly average advertising/SG&A ratio for every industry. To estimate advertising for a firm that does not report it, we multiplied the firm's SG&A with the average advertising/SG&A of the corresponding industry and year. The results are reported in Table 4, column (2). We consistently observe a positive and significant effect of nonmaterial ESG emphasis on the total ESG news volume. We also observe a marginally significant effect of firm size on ESG related news volume. It is possible that media attention benefiting executives may also positively impact firm value. To address this concern, we conducted an additional analysis, including total media mentions as a control variable in our main study. We found a negative and significant association between media mentions and firm value, which strengthens our assertion that increased media attention does not necessarily benefit firms. We report this analysis in Web Appendix B.

7. Robustness Checks

7.1 Including the Interactions with Material ESG Emphasis

Although we control for material ESG emphasis in our main model, we also test the robustness of our results including the interactions with material ESG emphasis. We find our results continue to hold as reported in Web Appendix C, Table C1.

7.2 Alternative Measure of Firm Value

In our primary model, we use Total q as a measure of firm value (Du and Osmonbekov 2020). However, Tobin's q has also been used widely as a measure of firm value (Malshe and Agarwal 2015). Accordingly, we performed our analysis using Tobin's q as well. Our results are robust as presented in Table C2 (see Web Appendix C).

7.3 Controlling for Advertising Intensity

In our primary model, we accounted for R&D intensity as a control variable. However, advertising intensity can also affect firm value, as noted in previous research (Malshe and Agarwal 2015). As many firms do not disclose their advertising expenditure, we use estimated advertising intensity (Malshe and Agarwal 2015) and observe consistent results, as presented in Table C3 (see Web Appendix C). To obtain a reasonable estimate of missing advertising, we use a combination of the estimates used in prior literature. For each firm that reports advertising, we compute the ratio of advertising to selling, general, and administrative expenses (SG&A) each fiscal year. Next, we obtain the yearly average advertising/SG&A ratio for every industry. To estimate advertising for a firm that does not report it, we multiply the firm's SG&A with the average advertising/SG&A of the corresponding industry and year.

8. App Implementation

Our dataset of ESG emphasis is quite novel, as, to the best of our knowledge, we are the first to extract the ESG emphasis scores for 26 metrics from earnings calls. Executives and investors can use the data to (1) visualize the evolution of nonmaterial and material ESG emphasis over time, (2) learn how a company is positioned on the ESG materiality map compared to its peers in the same industrial sector during the same year, and (3) quantify the impact of changes in nonmaterial and material ESG emphasis on firm

value. We facilitated these tasks by creating a web app (https://bit.ly/esg_app) rather than providing raw data, which can be difficult to manage for executives lacking a background in data analytics.

Table 4. Association of Nonmaterial ESG Emphasis with ESG News Volume

	(1) Total ESG News Volume$_t$		(2) Total ESG News Volume$_t$	
Nonmaterial ESG emphasis$_t$	133,615.708**	(59,809.002)	169,724.524***	(64,945.031)
Material ESG emphasis$_t$	31,842.319	(28,824.535)	44,844.510	(34,126.902)
Market share$_t$	-223,160.760	(365,442.923)	-609,284.795	(512,426.333)
Profit margin$_t$	-230,318.905	(259,913.339)	-121,801.759	(174,053.806)
Firm size$_t$	52,684.986*	(31,396.039)	82,150.269*	(43,873.899)
Total ESG news volume$_{t-1}$	0.914***	(0.113)	0.909***	(0.113)
Advertising intensity$_t$			231,338.577	(429,563.818)
Constant	405418.719*	(223119.204)	466832.339**	(228267.443)
No. of Obs.	23,792		19,630	
Autocorrelation AR (2)	0.104		0.115	
Hansen J test	0.933		0.875	
Number of instruments	97		97	
Time Fixed Effects	Yes		Yes	

Notes: Robust standard errors are in parentheses. Models are estimated using xtabond2 in Stata with two step robust option. *p* – values are reported for autocorrelation and Hansen J test. Given a substantial decrease of approximately 17.5% in the number of observations from 23,792 to 19,630, we do not include advertising intensity in our main model.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

The web app allows users to select an industrial sector, a specific firm within that sector, and the calendar year. When a user selects an industrial sector and a specific firm, the app displays a time-series plot of the nonmaterial and material ESG emphasis for that firm over the entire history available in the data. Thus, users can visualize how a company's ESG emphasis evolved over the years. Executives can use this visualization to analyze not only their own company's ESG emphasis, but also their competitors' ESG emphasis over time.

Benchmarking a company's ESG emphasis against industry competition is critical for executives and investors. When a user selects an industrial sector, a specific company, and a specific calendar year, the web app creates a scatterplot showing ESG emphasis of all the companies in the selected industry and during the selected year, with nonmaterial and material ESG emphasis as the two axes. The focal

company is identified using a different color than that of industry competitors. This scatterplot is similar in spirit to a perceptual map that depicts brands in two dimensions. Executives can use our web app to determine how differentiated their company is from the competition. Furthermore, if the company is indeed differentiated, the visualization helps understand whether the positioning is optimal.

The web app allows executives and investors to perform a what-if analysis by moving the focal company on the scatterplot to another location. With the new location, the web app automatically computes the coordinates of the point and updates the company's nonmaterial and material ESG emphasis scores. Next, using these updated values, the app shows the predicted Total q and the change in Total q compared to its current value. Executives can use this visualization to map multiple scenarios based on different emphases on nonmaterial and material ESG. From these scenarios, they can choose the ESG strategy that leads to a large increase in firm value. Investors can use this visualization to determine whether firms are leaving money on the table by not positioning themselves differently.

9. Discussion

The main goal of this study was to show that nonmaterial ESG emphasis hurts firm value. We test our conceptual framework grounded in agency theory, using data from earnings call transcripts. We provide guidance for managers on (1) how nonmaterial and material ESG emphasis relates to firm value, (2) how time, free cashflow, and market share affect this relationship, and (3) how to make informed decisions, optimize their ESG emphasis, and align their firm's ESG strategy with its performance goals through our web app. Moreover, in our media mention analysis, we reveal that emphasizing nonmaterial ESG aspects significantly boosts a firm's total ESG-related news volume. Conversely, the emphasis on material ESG factors does not yield a significant impact on total ESG-related news volume. In addition, nonmaterial ESG emphasis receives almost three times more media attention than material ESG but does not necessarily benefit firms as we found a negative and significant association between media mentions and firm value.

10. Research Contributions

Our study makes several contributions to existing research on ESG. First, it provides the first empirical evidence of the extensive nonmaterial ESG emphasis and demonstrates how ESG emphasis may have a negative impact on firm value. While existing ESG research primarily focuses on the impact of ESG performance, we shift our attention to ESG emphasis for two key reasons. First, there is no consistent or standardized reporting of ESG performance measures. Concerns regarding reliability and the lack of standardized methodologies in third-party agencies' ratings continue to grow (Berg et al. 2022, Tayan et al. 2022). Second, readily available ESG information (such as sustainability reports and ratings) may not fully meet investors' needs due to variations in firms' compliance with disclosure requirements and discretionary interpretations of material information (Diouf and Boiral 2017, Kolahgar and Schiehll 2020). Therefore, we focus on ESG emphasis rather than ESG performance. We exploit industry heterogeneity to show that nonmaterial and material ESG factors have significant and asymmetric effects on firm value. Specifically, while a 10% increase in material ESG can increase firm value by 4%, a 10% increase in nonmaterial ESG can lead to a 10.7% *decrease* in firm value. Our finding that nonmaterial ESG emphasis has a negative impact on firm value is novel to the literature on ESG.[15] This finding underscores the need for future studies to consider both nonmaterial and material ESG factors when evaluating the role of ESG for firms. This result also advances related prior research, finding that cause-related marketing announcements may lead to a significant loss of shareholder value for firms (Woodroof et al. 2019).

Second, our research demonstrates that ESG factors currently classified as "nonmaterial" have significant impacts on firm value, revealing a critical blind spot in existing frameworks. Our findings

[15] Khan, Serafeim, and Yoon (2016) report in Table 6B no impact of firm-level residual nonmaterial ESG emphasis on firm value. However, this evidence of a null effect is problematic because their ESG metric is based on KLD dataset which ends in 2012, whereas the concept of ESG materiality was introduced only in 2014.

necessitate a fundamental reconsideration of how ESG materiality is defined and assessed. Policymakers must act to ensure frameworks capture all value-relevant factors, not just those currently designated as material.

Third, we explore how time, free cashflow, and market share moderate the negative impact nonmaterial ESG factors have on financial performance. Our study addresses the call made by Serafeim and Yoon (2022) to study the complex and evolving nature of ESG factors. By investigating the impact of ESG factors over time, free cashflow, and market share using a novel dataset, we contribute to a deeper understanding of the relationship between ESG factors and financial outcomes, bridging the knowledge gap and advancing the field.

Fourth, construction of a novel dataset from earnings call transcripts using ESG-BERT is valuable to ESG research. Our method enhances data extraction with comprehensive ESG emphasis across 26 metrics and diversifies sources of data. Leveraging firsthand information from executives' communication offers insights into sustainability commitment and long-term ESG strategy. In addition, we heed recent calls for more emphasis on the use of diverse datasets (Serafeim and Yoon 2022) to examine the impact of ESG. Overall, our study contributes to the robustness and advancement of ESG research through enhanced data comprehensiveness, source diversification, and bridging of information gaps.

Finally, we offer the integration of research-driven apps into academic articles to drive enhanced understanding, consumption, adoption, and ongoing usage of research findings. By incorporating interactive and user-friendly apps, we empower readers to engage more deeply with scholarly work, promoting broader dissemination and practical application of research insights.

11. Managerial Implications

Our research offers several ways for firms to balance ESG and performance. First, it addresses the evolving expectations of investors. Specifically, investors now demand both environmental and social

initiatives from firms, but there is a limit to how much financial performance they are willing to sacrifice for these causes (Riedl and Smeets 2017). Our research offers concrete findings on the negative and positive impacts of ESG emphasis, providing executives with guidance on how to account for trade-offs necessary to satisfy various stakeholders, while safeguarding financial stability.

Our research reveals that the negative impact of emphasizing nonmaterial ESG factors is 2.68 times higher than the positive effect of material ESG factors on firm value.[16] This finding challenges the common misconception that emphasizing nonmaterial ESG factors can demonstrate ESG commitment to various stakeholders without any downsides. By highlighting the negative impact of nonmaterial ESG factors our research presents executives with a stark reality: Executives should keep this asymmetry in mind when trying to manage ESG factors. Executives can benefit from dynamic materiality assessment practices that expand beyond predetermined industry frameworks. By implementing comprehensive ESG reporting with data-driven materiality thresholds, firms can better capture evolving value drivers and emerging risks. This approach not only enhances investor decision-making but also positions companies to proactively identify and manage sustainability factors that meaningfully impact financial performance.

Second, our research reveals that the negative impact of nonmaterial ESG factors increases over time. This finding underscores the urgency for executives to take immediate action and reevaluate their focus on nonmaterial ESG factors. Over time, emphasis on nonmaterial ESG factors can erode a firm's reputation and credibility, as suspicions of their immateriality, inaccuracy, or misleading nature arise (Kim and Lyon 2015). To address these challenges, executives should critically assess their focus, ensuring a timely course correction on nonmaterial ESG factors.

Third, our study highlights the strong role of higher free cash flow in amplifying the detrimental impact of nonmaterial ESG on firm value. Conversely, a higher market share acts as a buffer, diminishing the adverse effects of nonmaterial ESG. For companies prioritizing nonmaterial ESG initiatives aimed at

[16] Statistical test shows that the magnitude of the impact of nonmaterial ESG emphasis on firm value is greater than that of the positive impact of material ESG (|nonmaterial ESG emphasis| – |material ESG emphasis| = 0.67, $p < 0.10$)

broader societal stakeholders, our research highlights heightened investor scrutiny, particularly when signs of agency costs are apparent, as indicated by higher free cash flow. However, investors are less inclined to penalize firms focusing on increasing their market share. Our findings offer a reprieve to CEOs who face mounting pressure to prioritize ESG initiatives, providing them with concrete findings to substantiate their decisions regarding emphasizing different ESG issues.

Fourth, our finding that nonmaterial ESG emphasis attracts three times more media attention than material ESG emphasis underscores various implications for managers. Shareholders might perceive such emphasis as being driven by executives pursuing personal gains rather than benefiting the firm. Regulatory bodies can leverage this insight to promote transparent and accountable ESG reporting. They can prioritize guidelines that emphasize the materiality of ESG factors while discouraging superficial efforts that merely attract media attention without significantly benefiting the firm.

Finally, we develop an interactive web app that not only benefits executives and investors but also enables researchers to make a tangible impact. It serves as a bridge between academia and real-world practice by translating research outcomes into actionable tools. Our web app ensures that research outcomes are not confined to academic circles but have a meaningful influence on industry practices and decision-making processes. It provides executives and investors with a user-friendly platform that supports their decision-making processes and helps them understand the impact of potential ESG initiatives on firm value.

12. Limitations and Future Research Directions

Our study reveals promising avenues for future research on nonmaterial and material ESG factors. While we focus on nonmaterial ESG factors' impact on firm value, it is crucial to note our study's limitation concerning evolving materiality. ESG factors labeled nonmaterial now might gain importance in the future (Kuh et al. 2020, Serafeim and Yoon 2022). Though our study uses fixed classifications over time, it paves the way for future research to examine the dynamic nature of these factors. Future studies

could also explore how firms adapt to evolving material ESG factors, ensuring long-term performance and sustainability.

In addition, our study highlights the significance of nonmaterial and material ESG factors for firm value. However, it does not explore the underlying mechanisms that drive their positive and negative impact. To enhance our understanding, future research should explore these mechanisms, drawing on insights from the marketing-finance literature, which emphasizes the importance of comprehending the direct effects and underlying relationships (Kuh et al. 2020, Serafeim and Yoon 2022, Edeling et al. 2021, Malshe et al. 2020, Malshe et al. 2023). Future research could delve into these mechanisms to unravel the intricacies of how nonmaterial and material ESG factors influence firm value, thereby providing valuable insights for effective decision making and strategy implementation.

Finally, our research relies on ESG materiality categorization by SASB. Recently, researchers and practitioners have proposed alternatives to this categorization (Brown et al. 2020; Dunfjäll 2025; Klein et al. 2023; Singh et al. 2025; Wang et al. 2025). As these new categorizations take hold, future research can assess their value relevance.

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Web Appendix

When Nonmateriality is Material: Impact of ESG Emphasis on Firm Value

Web Appendix A

Procedures to extract nonmaterial and material ESG emphasis.

To assess the emphasis placed by companies on 26 standard ESG factors within their earnings call transcripts, we employed a fine-tuned ESG BERT (Bidirectional Encoder Representations from Transformers) model (Mukherjee 2020). This model allowed us to classify sentences according to the 26 distinct ESG metrics outlined in Table A1. By utilizing this approach, we gained a comprehensive understanding of the ESG-related content present in the transcripts. To further classify each of the 26 issues as material or non-material, we utilized the materiality framework provided by the Sustainability Accounting Standards Board (SASB). SASB has developed industry-specific sustainability accounting standards, providing guidance on relevant ESG issues within specific sectors. By referencing the SASB materiality map (see Figure A1), we determined the materiality status of each of the 26 identified ESG issues, categorizing them as either material or non-material (see Figures A2a and A2b for Airlines and Telecommunications industry examples).

We now outline detailed steps and the procedure used to examine earnings call transcripts, extract ESG focus across 26 metrics, and operationalize the extent to which the company focused on the material (non-material) ESG issues in its communications.

Step 1: ESG-relevant Sentence Extraction

The first step involves identifying sentences that are relevant to ESG. Given that these transcripts cover a wide range of topics, including those beyond ESG, it becomes crucial to precisely pinpoint the sentences that discuss ESG issues to optimize model performance. We employed an ESG dictionary sourced from Baier, Berninger, and Kiesel (2020) to accomplish this. This comprehensive collection of keywords and phrases is specifically tailored to capture ESG-related topics, ensuring the accuracy and relevance of our analysis. We undertook a thorough manual review and enhancement process for the dictionary to alleviate potential bias concerns. After finalizing the dictionary, we applied it to our dataset. By systematically analyzing each sentence, we identified and retained only those that met the stringent criteria defined by the ESG

dictionary. This rigorous selection process allowed us to isolate and capture sentences that contained explicit ESG-related content while filtering out the text that did not exhibit a meaningful connection to the designated ESG keywords and phrases. This approach ensured the extraction of highly relevant and focused ESG-related sentences for further analysis and classification in subsequent research steps. Note that we retained the total number of sentences within each transcript for calculating the material and non-material ESG emphasis, as described later.

***Step 2*: ESG Metric Identification using ESG-BERT Model**

To classify ESG-relevant sentences into one of 26 ESG categories, we used the pre-trained ESG-BERT model developed by Mukherjee (2020). This model was specifically trained on a large corpus of ESG-related and sustainable investing texts, making it highly context-aware and domain-relevant.

Unlike general-purpose BERT models, ESG-BERT captures nuances in ESG discourse, including domain-specific terminology and subtle contextual cues often used in investor communications. Importantly, by not fine-tuning further the model on our own dataset, we avoid two major pitfalls:

1. **Overfitting to Firm-Specific Language Patterns**
   Fine-tuning on a limited corpus can lead to overfitting, where the model becomes too tailored to a specific vocabulary or linguistic structure. Using ESG-BERT as-is ensures broader applicability and replicability across firms, industries, and time periods.
2. **Bias Minimization and Objectivity**
   Fine-tuning introduces researcher discretion, potentially leading to unintended biases in category definitions or decision boundaries. Using the pre-trained model preserves the original training integrity, allowing for a consistent, neutral application across all transcripts.

Additionally, prior benchmarking (Mukherjee, 2020) shows that ESG-BERT outperforms both general BERT and traditional machine learning classifiers on ESG classification tasks (see Table A1):

Table A1. ESG-BERT Model Performance Metrics

Model Type	F1 Score	Details
ESG-BERT	0.90	Applied in this study
BERT-base	0.79	General-purpose model lacks ESG context
Traditional ML Models	0.67	Baseline using SVM/logistic regression

By leveraging already fine-tuned ESG-BERT in a zero-shot classification mode, we achieve both accuracy and scalability without compromising model neutrality. This choice represents a best-practice approach when a high-quality, domain-specific model is already available, especially in emerging areas like ESG where labeled data is limited and costly to generate.

Step 3: **Measure Validation**

To ensure reliability of ESG-BERT predictions, we conducted two validation exercises:

(a) *Human Coding Validation*

A random sample of 570 model-classified sentences was independently labeled by human coders without exposure to model outputs. ESG-BERT achieved an out-of-sample accuracy of 88.42%.

(b) *Large Language Model Benchmarking*

We also used Anthropic's Opus model to classify 400 sentences across four ESG categories (Product design and lifecycle management, Employee health and safety, Access and affordability, and GHG emissions). We first provided 25 sentences for each category as a training set and then provided 400 sentences as the test set. We got a 83.33% classification accuracy on the test set, which provides reassurance about the validity of ESG-BERT model. The Opus model achieved a classification accuracy of 83.3%, providing an encouraging

benchmark that supports the validity of ESG-BERT's predictions. However, we found that this approach is not scalable for our study due to the following limitations:

Non-replicability: LLM outputs are often non-deterministic, making it difficult to replicate results unless temperature and prompt settings are rigidly fixed—something that is rarely transparent or standard across sessions.

Time Efficiency: The process took approximately 30 minutes to classify 400 sentences, making it impractical for large-scale application (e.g., our dataset includes 36 million sentences).

Cost: Classifying 400 sentences cost $5, which would scale to prohibitively high expenses for our full dataset.

Reliability Concerns: LLMs are known to occasionally produce hallucinations—confident but inaccurate outputs—which undermines consistency and trustworthiness in systematic classification tasks.

Given these constraints, LLMs served only as a supplementary validation tool, while ESG-BERT remained the primary engine for large-scale ESG sentence classification due to its domain-specific accuracy, scalability, and reproducibility.

We provide 26 ESG categories and sample sentences in Table A2 and A3.

Step 4: **Matching GICS and SASB Industries**

To identify the material issues relevant to each industry according to the Sustainability Accounting Standards Board (SASB), we mapped the industry classifications of companies and SASB industries. As no existing mapping was available, we undertook a manual mapping process to bridge this gap. First, we used the Global Industry Classification Standard (GICS), a widely recognized industry classification system, to obtain an industry code for each company

from the Compustat dataset. We then manually matched and linked the GICS industry codes to the corresponding SASB industry codes. This mapping enabled us to connect each company to its respective SASB industry, facilitating the subsequent analysis of material ESG issues within specific industries. This mapping exercise ensured that our research accurately captured and aligned each company with its relevant SASB industry, providing a solid foundation for examining the materiality of ESG issues concerning specific sectors.

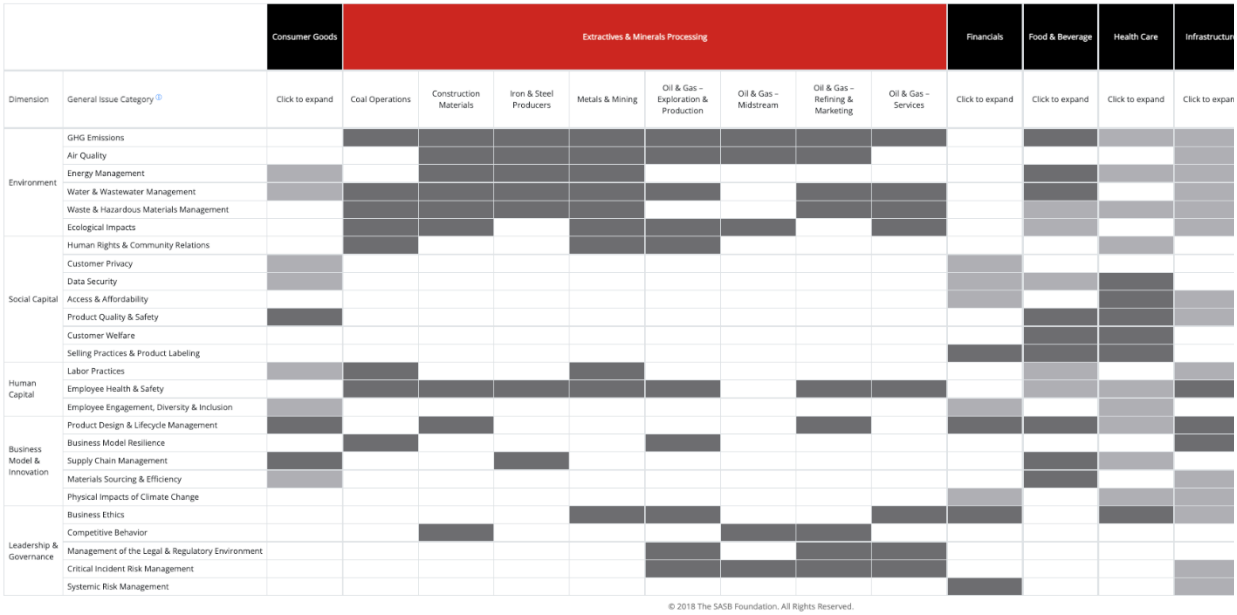
***Step 5*: Nonmateriality/ Materiality Assessment**

To assess the significance of each identified ESG issue, we turned to the materiality map provided by the Sustainability Accounting Standards Board (SASB). This map classifies each ESG metric as either material or non-material, considering factors such as financial performance and industry norms (see Figure A1). Using this map, we quantify the emphasis placed on the material (non-material) ESG issues by calculating the total number of sentences corresponding to each company's identified material (non-material) ESG metrics.

***Step 6*: ESG Nonmaterial and Material Emphasis**

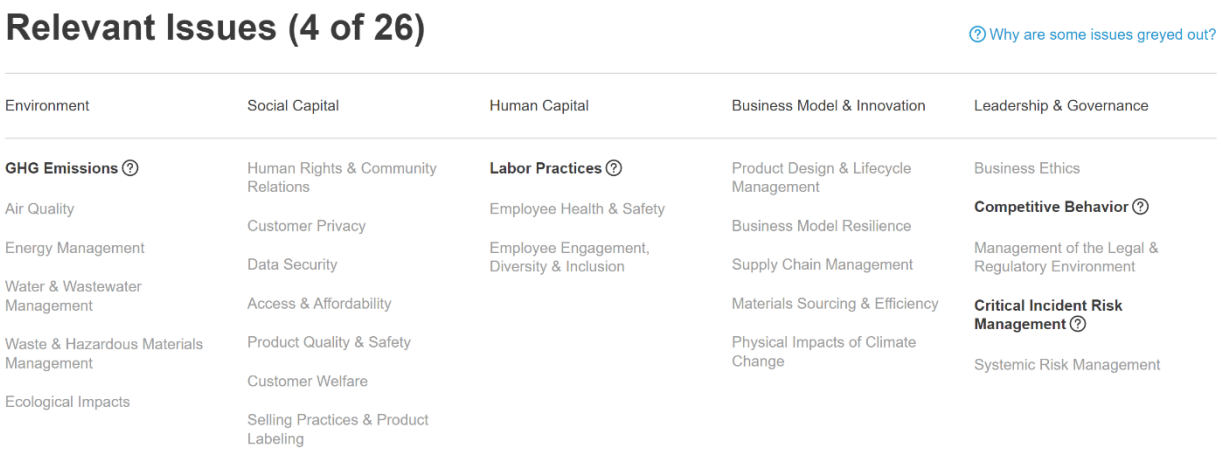
We relied on the total number of sentences extracted from all transcripts to determine the relative focus and attention given to non-material (material) ESG issues for a specific company in a given year. To operationalize the extent to which the company focused on non-material (material) ESG issues in its communications, we divided the count of sentences related to non-material (material) ESG issues by the total number of sentences for each company in a year.

Figure A1: Sector-Level Materiality Map



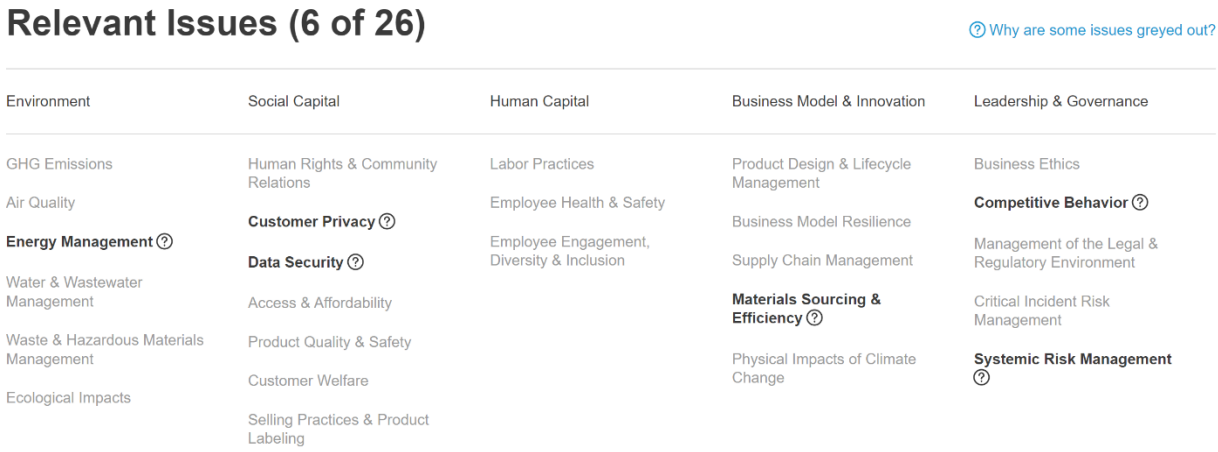
Source: Sustainability Accounting Standards Board (http://www.sasb.org/).
Dark (light) grey color means that the issue is material for more (less) than 50 percent of the industries within the sector. White means that the issue is not material for any industry within the sector. To see materiality maps at the industry level, visit: http://www.sasb.org/.

Figure A2a: Material Issues for Airlines



Source: Sustainability Accounting Standards Board (http://www.sasb.org/).

Figure A2b: Material Issues for Telecommunications



Source: Sustainability Accounting Standards Board (http://www.sasb.org/).

Table A2: 26 ESG Metrics

S.No	ESG Metrics
1	Business Ethics
2	Data Security
3	Access And Affordability
4	Business Model Resilience
5	Competitive Behavior
6	Critical Incident Risk Management
7	Customer Welfare
8	Director Removal
9	Employee Engagement Inclusion And Diversity
10	Employee Health And Safety
11	Human Rights And Community Relations
12	Labor Practices
13	Management Of Legal And Regulatory Framework
14	Physical Impacts Of Climate Change
15	Product Quality And Safety
16	Product Design And Lifecycle Management
17	Selling Practices And Product Labeling
18	Supply Chain Management
19	Systemic Risk Management
20	Waste And Hazardous Materials Management
21	Water And Wastewater Management
22	Air Quality
23	Customer Privacy
24	Ecological Impacts
25	Energy Management
26	GHG Emissions

Note: SASB's framework does not include "Director Removal", hence we do not consider that variable in our analysis.

Table A3: Sample classifications from ESG BERT

Sentence	Classifications
These regulations are increasingly the -- or reducing the -- increasing the stringency of requirements for a whole number of different areas, so SOx and NOx particulates, a number of areas.	Air_Quality
And the added benefit is the plants that are going into service there tend to be supercritical and ultra-supercritical plants, bigger plants, which are more efficient and more environmentally friendly than the smaller ones, but also have much more Colfax content than the smaller ones.	Energy_Management
And certainly, in environmental terms, if carbon capture happens, then it's bigger than any other environmental things we've seen in the past, but obviously there's a high level of uncertainty on that.	GHG_Emissions
What we're basically doing is we are targeting adjacent applications, and we're also making sure we're focusing on segments of good, short and medium-term growth opportunities like, for example, in LNG, driven by the gas market and particularly by unconventional gas development or in mechanical vapor compression, which has got really strong drivers from environmental regulations and energy efficiency.	Energy_Management
The more we can take our fixed costs in labor and make them variabilize, the better off we're going to be.	Labor_Practices
And so talk about variabilized labor.	Labor_Practices
And we're taking out huge costings that were inside of a supply chain that was really working its way from setting up in Queensland with some of our production up in that area with a lot of the consumption being down in New South Wales and Victoria.	Supply_Chain_Management
We got the Geelong kiln, the water treatment project.	Water_And_Wastewater_Management
And we're encouraging our employees, but we don't have the power to force anyone to do anything.	Business_Ethics
Whether they are on site with growers, in our offices or in factories, their attention to customer service, quality assurance and safety is outstanding.	Product_Quality_And_Safety
In the past 12 months, GrainCorp has injected over $0.5 million into grassroots projects that deliver real value to our local communities.	Human_Rights_And_Community_Relations

We have also renewed our partnership with the Clontarf Foundation, which is doing incredible work to improve the education and employment prospects of hundreds of young aboriginal men in regional towns across our network.	Human_Rights_And_Community_Relations
It is our mission to strengthen our prominent market position in each of the segments and to ensure a sustainable profitability.	Business_Model_Resilience
These statements are based on current expectations and beliefs of management and are subject to certain risks and uncertainties that could cause actual results to differ materially from those described in the forward-looking statements.	Systemic_Risk_Management
And that's how we build our best-in-class team and the talent pipeline for the future.	Employee_Engagement_Inclusion_And_Diversity

References:

Baier, P., M. Berninger, and F. Kiesel. 2020. Environmental, social and governance reporting in annual reports: A textual analysis. *Financial Markets, Institutions & Instruments* 29(3) 93–118.

Mukherjee, A. 2020. *ESG-BERT: NLP Meets Sustainable Investing.* Towards Data Science. https://towardsdatascience.com/nlp-meets-sustainable-investing-d0542b3c264b (accessed October 31, 2025).

Web Appendix B. Media Mentions and Firm Value

Media mentions and firm value.

We have argued that managers may emphasize nonmaterial ESG issues to gain personal reputational benefits through increased media attention. In support of this argument, we find that emphasizing nonmaterial ESG aspects significantly boosts a firm's total ESG-related news volume (133,615.71, $p < 0.05$). Conversely, the emphasis on material ESG factors does not significantly impact total ESG-related news volume. In addition, nonmaterial ESG emphasis receives almost three times more media attention than material ESG. To address a potential concern that media attention benefiting executives may also positively impact firm value, we conducted an additional analysis, including total media mentions as a control variable in our main study, and report the results in Table B1. The association between media mentions and firm value is negative and significant ($b = -0.025$, $p < 0.01$).

Table B1. Media Mentions and Firm Value

	(1) Firm Value $_{t+1}$ (natural log of Total q)		(2) Firm Value $_{t+1}$ (natural log of Total q)	
ESG nonmaterial emphasis $_t$	-1.337***	(0.306)	-1.402***	(0.306)
ESG nonmaterial emphasis $_t$ x time elapsed $_t$			-0.007	(0.004)
ESG nonmaterial emphasis $_t$ x free cashflow $_t$			-0.048	(0.136)
ESG nonmaterial emphasis $_t$ x market share $_t$			0.201***	(0.072)
Time elapsed $_t$	0.076***	(0.012)	0.047**	(0.022)
Free cashflow $_t$	0.073	(0.149)	-0.113	(0.599)
Market share $_t$	0.092	(0.151)	0.952***	(0.348)
ESG material emphasis $_t$	0.430**	(0.199)	0.447**	(0.198)
Firm leverage $_t$	-0.802***	(0.088)	-0.791***	(0.088)
Profit margin $_t$	0.400***	(0.125)	0.403***	(0.125)
Firm size $_t$	-0.121***	(0.035)	-0.128***	(0.035)
R&D intensity $_t$	-7e-05	(6e-05)	-7e-05	(6e-05)
Industry concentration $_t$	0.075	(0.157)	0.075	(0.156)
ESG news volume $_t$	**-.025*** **	**(0.007)**	**-0.025*** **	**(0.007)**
Control function: ESG material emphasis $_t$	-0.410**	(0.200)	-0.428**	(0.199)
Control function: ESG nonmaterial emphasis $_t$	1.233***	(0.306)	1.294***	(0.306)
Constant	-2.247	(1.515)	-2.366	(1.513)
No. of Obs.	24,493.000		24,493.000	
Time fixed effects	Yes		Yes	
Firm fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	
R-square	0.062		0.062	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Time elapsed, free cashflow and market share are all mean centered. ESG news volume is operationalized as natural log of ESG news volume. Given a substantial decrease of approximately 36% in the number of observations (from 38,498 to 24,493), we do not include ESG news volume in our main model.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Web Appendix C. Robustness Checks

We include a selection equation for all robustness checks. The results are below.

Including the interactions with material ESG emphasis

Although we control for material ESG emphasis in our main model, we also test the robustness of our results by including the interactions with material ESG emphasis. We find our results continue to hold, as reported in Table C1.

Table C1. Robustness Checks: With Interaction Effects of Material ESG

	Main Model + Interaction Effects for Material ESG (Firm Value $_{t+1}$)	
Nonmaterial ESG emphasis $_t$	-1.066***	(0.304)
Nonmaterial ESG emphasis $_t$ x time elapsed $_t$	0.401**	(0.192)
Nonmaterial ESG emphasis $_t$ x free cashflow $_t$	-0.008**	(0.003)
Nonmaterial ESG emphasis $_t$ x market share $_t$	-0.196**	(0.099)
Material ESG emphasis $_t$	0.180**	(0.071)
Time elapsed $_t$	-0.062***	(0.020)
Free cashflow $_t$	-1.206***	(0.405)
Market share $_t$	0.457	(0.353)
Firm leverage $_t$	-0.804***	(0.068)
Profit margin $_t$	0.412***	(0.090)
Firm size $_t$	-0.099***	(0.035)
R&D intensity $_t$	-0.000	(0.000)
Industry concentration $_t$	0.171	(0.138)
Ctr Fun for nonmaterial ESG emphasis $_t$	1.003***	(0.303)
Ctr Fun for material ESG emphasis $_t$	-0.395**	(0.193)
Material ESG emphasis $_t$ x time elapsed $_t$	-0.001	(0.002)
Material ESG emphasis $_t$ x free cashflow $_t$	-0.104*	(0.059)
Material ESG emphasis $_t$ x market share $_t$	-0.023	(0.049)
Constant	-1.199	(1.575)
No. of Obs.	38,498	
R-square	0.052	
Year fixed effects	Yes	
Firm fixed effects	Yes	
Industry fixed effects	Yes	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Time elapsed, free cashflow and market share are all mean centered.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Alternative measure of firm value

In our main model, we used Total q as a firm value measure. However, another frequently used metric of firm value is Tobin's q (Germann, Ebbes, Grewal 2015), the ratio of a firm's market value to the current replacement cost of its assets (Tobin 1969). It is a forward-looking, capital market-based measure of the value of a firm. It provides a measure of the premium (or discount) that the market is willing to pay above (below) the replacement costs of a firm's assets, thus capturing any above-normal returns expected from a firm's collection of assets (Amit and Wernerfelt 1990). Another appealing feature of Tobin's q is that it adjusts for expected market risk; in other words, because Tobin's q combines capital market data with accounting data, it implicitly uses the correct risk-adjusted discount rate and thus minimizes distortion. Table C2 shows that our results are robust to using Tobin's q as an alternative measure of firm value.

Table C2. Robustness Checks: With Alternative Measure Of Firm Value

	Firm Value $_{t+1}$(natural log of Tobin's q)	
Nonmaterial ESG emphasis $_t$	-0.349***	(0.100)
Nonmaterial ESG emphasis $_t$ x free cashflow $_t$	-0.087**	(0.034)
Nonmaterial ESG emphasis $_t$ x time elapsed $_t$	-0.003**	(0.001)
Nonmaterial ESG emphasis $_t$ x market share $_t$	0.045*	(0.024)
Material ESG emphasis $_t$	0.104*	(0.062)
Free cashflow $_t$	-0.307**	(0.144)
Time elapsed $_t$	-0.017***	(0.006)
Market share $_t$	0.117	(0.109)
Profit margin $_t$	0.091***	(0.035)
Firm leverage $_t$	-0.307***	(0.022)
Firm size $_t$	-0.069***	(0.012)
Industry concentration $_t$	0.088*	(0.045)
R&D intensity $_t$	-0.000**	(0.000)
Ctr Fun Correction for ESG Non-Material Emphasis $_t$	0.333***	(0.100)
Ctr Fun Correction for ESG Material Emphasis $_t$	-0.103*	(0.062)
Constant	0.624	(0.504)
No. of Obs.	38,184	
Year fixed effects	Yes	
Firm fixed effects	Yes	
Industry fixed effects	Yes	
R-square	0.101	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Time elapsed, free cashflow and market share are all mean centered.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

Controlling for advertising intensity

As some firms do not disclose their advertising expenditure, we construct estimated advertising intensity for each firm, following prior research (Malshe and Agarwal 2015). For each firm that reports advertising, we computed the ratio of advertising to selling, general, and administrative expenses (SG&A) each fiscal year. Next, we obtained the yearly average advertising/SG&A ratio for every industry. To estimate advertising for a firm that does not report it, we multiplied the firm's SG&A with the average advertising/SG&A of the corresponding industry and year. Table C3 demonstrates the robustness of the negative impact of nonmaterial ESG to adding this control variable.

Table C3. Impact of Nonmaterial ESG on Firm Value with Advertising Intensity

	Firm Value $_{t+1}$ (natural log of Total q)	
Nonmaterial ESG emphasis $_t$	-1.386***	(0.391)
Nonmaterial ESG emphasis $_t$ x free cashflow $_t$	-0.185	(0.137)
Nonmaterial ESG emphasis $_t$ x time $_t$	-0.011***	(0.004)
Nonmaterial ESG emphasis $_t$ x market share $_t$	0.173**	(0.079)
Material ESG emphasis $_t$	0.422**	(0.210)
Free cashflow $_t$	-0.520	(0.592)
Time elapsed $_t$	-0.066***	(0.022)
Market share $_t$	0.526	(0.377)
Profit margin $_t$	0.493***	(0.104)
Firm leverage $_t$	-0.727***	(0.084)
Firm size $_t$	-0.165***	(0.056)
R&D intensity $_t$	-0.001**	(0.001)
Industry concentration $_t$	0.355**	(0.159)
Advertising intensity $_t$	0.008	(0.014)
Ctr Fun Correction for nonmaterial ESG Emphasis $_t$	1.315***	(0.390)
Ctr Fun Correction for material ESG Emphasis $_t$	-0.426**	(0.211)
Constant	-2.060	(1.914)
No. of Obs.	31,439	
Year fixed effects	Yes	
Firm fixed effects	Yes	
Industry fixed effects	Yes	
R-square	0.056	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Time elapsed, free cashflow and market share are all mean centered. Given a substantial decrease of approximately 18% in the number of observations from 38,498 to 31,439, we do not include advertising intensity in our main model.

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$.

References

Germann F, Ebbes P, Grewal R (2015) The chief marketing officer matters! *Journal of Marketing* 79(3):1–22.

Malshe A, Agarwal MK (2015) From finance to marketing: The impact of financial leverage on customer satisfaction. *Journal of Marketing* 79(5):21–38.