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When Non-Materiality 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 among various firm stakeholders. Increasingly, top executives face a dilemma: How can they address investor demand for emphasizing ESG when studies often show no incremental returns to ESG investing? The authors propose a conceptual framework to examine the impacts of emphasizing nonmaterial and material ESG factors on firm value. ESG factors are nonmaterial (material) when excluding them from corporate disclosure would not (would) significantly alter the overall information available to a reasonable investor. Using a deep learning model to earnings call transcripts of 6,730 firms from 2005 to 2021 to measure ESG emphasis the authors estimate panel data models for testing this framework. The analysis reveals a 1% increase in nonmaterial ESG emphasis decreases firm value by .30%. This negative impact on firm value is 2.12 times higher than the positive impact of material ESG emphasis. Furthermore, the negative impact of nonmaterial ESG emphasis on firm value grows over time and is more pronounced in regulated industries. Finally, the authors develop an interactive app to assist executives and investors in comparing companies against competitors and quantifying the firm value impact of changing ESG emphasis.

Keywords

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

The question of how much emphasis corporate leaders should place on environmental, social, and governance (ESG) factors to enhance firm value has become increasingly salient. A growing body of literature highlights the importance of addressing ESG-related concerns and expanding communications (PwC 2021; Reali, Grzech, and Garcia 2021), as some investors argue that such an approach is essential for long-term value creation. However, this perspective is not universally shared as some investors remain skeptical about the potential trade-offs between ESG objectives and financial performance (Riedl and Smeets 2017). Recent research suggests that a focus on ESG may not necessarily yield incremental returns (Larcker, Tayan, and Watts 2022), further fueling the debate on the merits of ESG investing. This divergence in investor sentiment underscores the need for a more nuanced understanding of the role of ESG factors in enhancing firm value.

In this research, we seek to explain this rift by examining the impact of emphasizing nonmaterial vs. material ESG factors in strategic communication on firm value. We use the current Sustainability Accounting Standards Board's (SASB) materiality map to categorize the ESG factors as nonmaterial vs. material.[1] ESG factors are nonmaterial (material) if their omission from corporate disclosure would not (would) substantially change the overall mix of information available to a reasonable investor (Lee 2021). For example, in industries such as digital media, telecommunications, and banking services, customer privacy and data security are material concerns,[2] but greenhouse gas emissions management is nonmaterial. We term the extent to which firms emphasize nonmaterial (material) ESG factors in their strategic communication as *nonmaterial (material) ESG emphasis*.

[1] https://sasb.org/standards/materiality-map/
[2] Please see https://sasb.org/standards/materiality-finder/.

Emphasizing ESG factors is often associated with increased costs (Aupperle, Carroll, and Hatfield 1985; Friedman 1970; Jensen 2002; McWilliams and Siegel 1997). Consequently, investors seek signals to gauge a firm's ability to mitigate these costs. We posit that ESG emphasis may act as a strong informative signal for this purpose, as it is *costly, observable and desirable* (Connelly et al. 2011; Berger 2019). When firms emphasize nonmaterial (vs. material) ESG factors, investors may perceive it as a negative (vs. positive) signal, signifying potential cost disadvantages (vs. advantages), resource allocation inefficiencies (vs. efficiencies), and managerial distraction (vs. attention) (Ocasio and Joseph 2005).

Additionally, we propose that the negative effects of nonmaterial ESG will dominate the positive effects of material ESG on firm value, consistent with Rozin and Royzman's (2001) argument that negative entities are more potent and dominant than positive entities. Furthermore, we posit that the negative (vs. positive) impact of nonmaterial (vs. material) ESG emphasis on firm value increases over time. This is because the standards about materiality from organizations like the SASB have been gaining prominence over the past decade, so investors increasingly expect managers to distinguish between material and nonmaterial ESG factors more easily over time. As such, nonmaterial (vs. material) ESG emphasis should become a more observable signal of disengaged and distracted management over time. Finally, we expect the negative (vs. positive) impact of nonmaterial (vs. material) ESG emphasis on firm value to be more pronounced for the firms operating in regulated industries. The reason is that investors of the regulated firms may have a greater *desire* to receive signals reassuring them of steady returns, associated with activities that do not change the stable risk profiles of their investments. The immediate costs of nonmaterial ESG emphasis will likely grind down the already low margins, resulting in lower cashflows.

We test our propositions by analyzing earnings call transcripts from 6,730 firms containing 10,142,523 sentences from 2005 to 2021. Using the deep learning model ESG-BERT (Mukherjee 2020), we identify 26 ESG metrics discussed in the literature. We categorize 26 ESG industry-specific measures by industry to identify material and nonmaterial issues while adopting the classifications of materiality provided by the SASB and merge this data set with financial statements data from COMPUSTAT. 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 material and nonmaterial ESG factors on firm value. For each 1% increase in emphasis on material ESG factors, firm value increases by .14%, while the same increase in the emphasis on nonmaterial ESG factors leads to a decline in firm value by .30%. Additionally, we show that the negative impact of nonmaterial ESG factors intensifies over time, leading to an annual increase in strength of the negative impact of .003% in firm value. Finally, we show a stronger negative (positive) effect when firms operating in regulated industries emphasize nonmaterial (material) ESG factors. Specifically, we observe a .034% increase in the strength of the negative effect of nonmaterial ESG factors and a .029% increase in the strength of the positive effect of material ESG factors.

Our findings make several contributions to the growing field of ESG research and practice. First, we present empirical evidence for the *materiality of nonmaterial ESG emphasis* and its overwhelmingly large negative impact on firm value. This implies that researchers and investors alike should avoid aggregating material and nonmaterial ESG factors into a single metric, as doing so will likely bias their results. Our findings also substantially advance

executives' understanding of how emphasizing material and nonmaterial ESG factors differentially affects firm value.

Second, our finding that the negative impact of nonmaterial ESG factors intensifies over time underscores the urgency for executives to take immediate action and reevaluate their emphasis on nonmaterial ESG factors. Third, our findings show that it is more expensive for regulated firms to emphasize nonmaterial ESG factors. By strategically deallocating (vs. allocating) resources and attention to ESG factors that do not hold relevance for their specific industry and stakeholder expectations, regulated firms can reassure their investors.

Finally, our findings enable executives to assess the impacts 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 a web app to map firms on their emphasis on material versus nonmaterial ESG factors. In doing so, we respond to *Journal of Marketing*'s call for more articles on research-driven apps.[3] Our app allows users to navigate and assess the performance impact of their current and potential future ESG strategies.

Literature Review

Related Work

[3] https://www.ama.org/journal-of-marketing-call-for-papers-marketing-impact-with-research-driven-apps/

Surveys indicate that many management executives believe that a good ESG strategy can lead to better long-term performance. However, despite extensive research, studies widely diverge in their predictions of the return on improving ESG characteristics.

On the one hand, ESG improvements can enhance various crucial value drivers for a firm, such as growth, profitability, capital efficiency, and risk exposure (Schramade 2016). From a shareholder perspective, ESG improvements result in stronger external relationships, better risk management, lower cost of capital, sustained competitiveness, and increased human capital for the future, preparing the firm for market changes (Lo and Sheu 2007; Orlitzky, Schmidt, and Rynes 2003). On the operational side, ESG can improve reputation and increase sales growth, reduce the risk to the firm, and attract more skilled employees through the impact of advertising (Fombrun and Shanley 1990; Luo and Bhattacharya 2009; Orlitzky, Schmidt, and Rynes 2003).

On the other hand, economic theory suggests that high-ESG firms typically have lower expected returns than other firms as socially responsible investors may not require high levels of compensation to hold these firms' stocks (Fama and French 2007; Pástor, Stambaugh, and Taylor 2021). Furthermore, empirical evidence shows that "sin" stocks—that is, stocks of firms operating in industries such as alcohol, tobacco, guns, and military weapons—and firms with high carbon emissions have higher risk-adjusted returns (Bolton and Kacperczyk 2020; Hong and Kacperczyk 2009; Luo and Balvers 2017; Pástor, Stambaugh, and Taylor 2022). Friedman (1970) argues that corporate managers, as agents of firms' shareholders, should carry out the business in accordance with shareholders' desire for wealth maximization.

While extensive research has investigated the relationship among CSR, corporate social performance, and ESG factors with various firm performance measures, a systematic review of

the literature reveals three significant gaps.[4] First, most research considers ESG as a monolithic construct. However, as we show, material and nonmaterial ESG emphasis have asymmetric impacts on firm value. Without the ability to quantify the differential impact of ESG factors on financial outcomes, senior managers may become discouraged and withdraw their support. Indeed, one of the main challenges firms face when investing in ESG programs is securing buy-in from C-suite executives (Rosenbaum 2022).

Second, while prior studies have focused on establishing a cross-sectional relationship between CSR and firm performance at a specific point in time (Kang, Germann, and Grewal 2016; Khan, Serafeim, and Yoon 2016; Lo and Sheu 2007; Konar and Cohen 2001; Servaes and Tamayo 2013), they have not explored how this relationship evolves and potentially changes over time and varies across industries. For example, research indicates that firms in heavily regulated industries show greater commitment to sustainability and engage more in ESG activities (Hadani and Schuler 2013; Hillman, Keim, and Schuler 2004).

Third, previous empirical research examining the impact of ESG or CSR on firm performance has predominantly relied on the KLD data set (see Table 1). However, using this data set has two major limitations. Its binary nature (using a dichotomous variable indicating whether a firm exhibits strengths or weaknesses on specific sustainability issues) oversimplifies the intricate complexities associated with the variables under investigation (Serafeim and Yoon 2022). Moreover, KLD predates the significant growth and development of the ESG revolution in the past decade (Morningstar 2021; Peterdy 2023).

We aim to close these gaps and illuminate the complex relationship between ESG and firm value, offering insights into the specific value drivers affected by ESG initiatives.

[4] Although many papers use CSR and ESG synonymously there are significant differences between these two concepts. We provide more detailed differentiation in the web appendix C.

Table 1. Relevant Literature

Article	Construct	Effect	Temporal Variation of Effect	Material ESG	Nonmaterial ESG	Data Source for CSR/ESG	Performance Measure
Luo and Bhattacharya (2009)	CSP	CSP reduces idiosyncratic risk.	×	×	×	Fortune's MAC source	Idiosyncratic risk; systematic risk
Kang, Germann, and Grewal (2016)	CSR	Positive (no effect) when CSR is a good management (penance) mechanism	×	×	×	KLD	Tobin's q
Nickerson et al. (2022)	CSR	Positive (negative) when firms take (do not take) accountability for negative externalities	×	×	×	CSRwire database; brand websites; experiments	(1) Brand sales, (2) purchase intentions
Mishra and Modi (2016)	CSR	No direct effect on shareholder wealth but in the presence of marketing capability, positive for stock returns; negative for risk	×	×	×	KLD	Stock returns, idiosyncratic risk
Homburg, Stierl, and Bornemann (2013)	CSR	CSR increases customer loyalty.	×	×	×	Questionnaire/survey	Customer loyalty
Luo and Bhattacharya (2006)	CSR	Positive (negative) for firms with high (low) innovation capability	×	×	×	Fortune America's Most Admired Corporations	Stock return, Tobin's q
Servaes and Tamayo (2013)	CSR	Positive (negative/n.s.) for firms with high (low) customer awareness; effects reversed for firms with poor reputations as corporate citizens	×	×	×	KLD	Tobin's q
Perrini et al. (2011)	CSR	Relationship between CSR and financial performance is intricate and complicated.	×	×	×	Conceptual	
Lo and Sheu (2007)	CSR	Positive relationship between corporate sustainability and market value.	×	×	×	Dow Jones Sustainability Group Indexes	Tobin's q
Orlitzky, Schmidt, and Rynes (2003)	CSR	Corporate social and environmental responsibility can pay off financially.	×	×	×	The meta-analysis of 52 studies	

Konar and Cohen 2001	Environmental performance	Reduction in emissions of toxic chemicals results in increased market value.	×	×	×	Corporate Environmental Profiles, Investor Research Responsibility Center 1993.	Tobin's q
Consolandi, Eccles, and Gabbi (2022)	ESG	ESG momentum & ESG materiality concentration have a consistent and positive impact on equity performance.	×	✓	×	TVL(Truvalue Labs) Insight Score Thomson Eikon Datastream	Equity returns
Khan, Serafeim, and Yoon (2016)	ESG	Greater for firms with good ratings on material issues; no effect of nonmaterial issues.	×	✓	✓	MSCI KLD; SASB classification	Stock returns; return on sales; sales growth
Madison and Schiehll (2021)	ESG	Financial materiality affects the informative value of ESG scores and rankings.	×	✓	×	MSCI ESG Ratings	ESG scores/ratings
Schramade (2016)	ESG	Integrating ESG factors into valuation and investment decisions enhances decision making, risk management, and long-term financial performance.	×	×	×	127 investment cases	
Eccles, Ioannou, and Serafeim (2014)	Sustainability	High sustainability companies excel in stakeholder engagement, long-term focus, and nonfinancial information disclosure. They also outperform their counterparts in stock market and accounting performance.	×	×	×	Policies related to the environment, employees, community, products, and customers according to Thomson Reuters ASSET4 database	Corporate governance; stakeholder engagement; stock market performance; long-term orientation
This study	**ESG**	**Positive (negative) for material (nonmaterial) ESG emphasis; negative effect of nonmaterial ESG grows over time.**	✓	✓	✓	**Textual analysis using deep learning of earnings call transcripts; SASB classification**	**Tobin's q**

Notes: CSP = corporate social performance

Conceptual Framework

ESG Emphasis and Signaling Theory

Signaling theory provides a useful conceptual framework for understanding how ESG emphasis by firms (signals) could inform stakeholders and enable them to make judgments based on these signals (Connelly et al. 2011; Spence 1973, 2002). Informative signals must be observable to external parties (Pancer, McShane, and Noseworthy 2017), desirable (Berger 2019), and costly enough to discourage low-quality actors from imitating them (Connelly et al. 2011). By using informative signals, economic actors can effectively convey that they possess unique qualities that differentiate them from others in the market (Sanders and Boivie 2004). ESG emphasis meets all three crucial characteristics of strong signals.

First, a firm's ESG emphasis is desirable, as investors and analysts factor it into their decision-making (Doh et al. 2010; Luo et al. 2014). Mainstream investors are increasingly seeking ESG information from companies as a crucial element in their decision-making process.[5] ESG-related information serves as a tool for positive and negative screening, enabling investors to evaluate the sustainability performance of firms (Amel-Zadeh and Serafeim 2018). Thus, a firm's emphasis on ESG factors can provide firsthand information and act as a powerful signal of a firm's commitment to ESG.

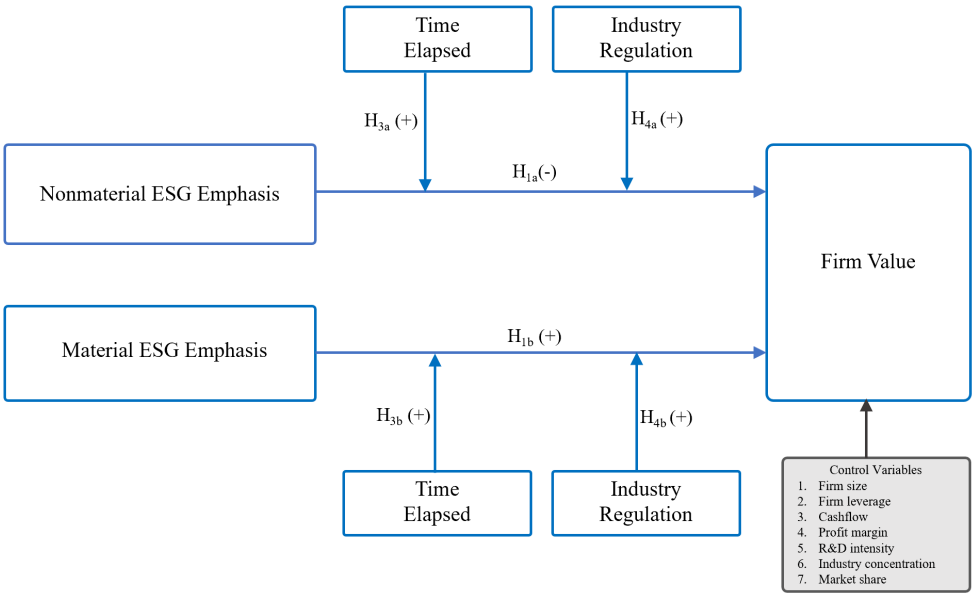
Second, the idea of ESG emphasis being an observable signal is not new. For instance, companies use it as a signal to mitigate information disparities regarding its product sustainability, quality, or societal dedication (Connelly et al. 2011). Similarly, ESG emphasis signals a firm's commitment to dedicating reasonable resources necessary for nurturing sustainable stakeholder relationships (Barnett 2007). It acts as a positive signal in the presence of

[5] The Principles for Responsible Investment now has more than 2,300 signatories who have more than $89 trillion in assets under management (https://www.unpri.org/about-us/about-the-pri)

capital market information gaps, boosting creditors' confidence and attracting potential investors (Bai et al. 2022). Strong ESG emphasis signifies stability, long-term commitment, and market trust (Sacconi and Antoni 2011). It also appeals to safety-conscious institutional investors (Wang and Chen 2017). Finally, emphasizing ESG issues requires substantial investments and commitments (Freiberg, Rogers, and Serafeim 2020), making it a costly signal to imitate.

Taken together, ESG emphasis can act as informative signal of the firm's long-term value and potential for sustainable growth (Eccles and Kastrapeli 2017). Figure 1 depicts the conceptual framework that identifies the direct effect of nonmaterial and material ESG emphasis on firm value, the moderating role of time, and regulation. Next, we delineate the specific hypotheses in our conceptual framework.

Figure 1. Conceptual framework.



H2: The negative effect of the nonmaterial ESG emphasis on firm value will be greater than the positive effect of material ESG emphasis on firm value.

ESG Emphasis and Firm Value

Informative signals may be of positive or negative valence and also vary in *strength* (Bergh et al. 2014). With ESG emphasis potentially increasing a firm's costs, investors actively seek information to quantify future cash flows necessary to recuperate these expenses (Krueger, Sautner, and Starks 2020). Thus, both material and nonmaterial ESG emphasis can convey positive or negative signals to different stakeholders. For instance, an airline prioritizing GHG emissions sends a robust positive signal to enhance its standing in the eyes of investors. Yet, these emissions might be nonmaterial to customers, who may prioritize cost or route while booking flights. Conversely, if the same company focuses on social issues like gender diversity or indulge in social activism, consumers may perceive it as a positive signal, but investors likely view it as a negative signal, because it indicates a diversion of attention and energy away from financially critical areas, thereby potentially eroding shareholder value (Grewal, Serafeim, and Yoon 2016).

In our context, because ESG factors typically increase a firm's costs (Aupperle, Carroll, and Hatfield 1985; Friedman 1970; Jensen 2002; McWilliams and Siegel 1997), investors actively *desire* signals to infer the likelihood that the firm can offset these costs. ESG emphasis can serve as such signal. For example, consider an energy company that emphasizes shifting energy management through renewable energy sources, such as solar and wind power. These ESG factors are material in the energy sector, as this shift directly influences its business model and finances. Investors interpret this move as a potent signal of the firm's potential for improved financial performance over time, fueled by operational efficiency gains and regulatory advantages. However, when the same firm emphasizes ESG factors that are nonmaterial in the energy sector,

such as local community engagement, investors' uncertainty about the firm's ability to recover costs (get a non-negative return on that investment) will likely increase.

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, Serafeim, and Yoon 2016). Furthermore, research suggests that managers often emphasize nonmaterial ESG factors in companies facing agency problems, lacking awareness of sustainability materiality, or exhibiting poor performance on material issues (Grewal, Serafeim, and Yoon 2016). Accordingly, investors will likely lower the valuation of firms emphasizing nonmaterial ESG.

In contrast, material ESG issues refer to environmental, social, and governance factors that are relevant to a company's business operations and financial performance. Addressing and transparently disclosing these issues demonstrates a commitment to responsible business practices and enhances stock price information quality (Kolahgar and Schiehll 2020; Grewal, Hauptmann, and Serafeim 2021). Emphasizing material ESG issues involve data collection, internal controls, shareholder disclosure, CEO and CFO acknowledgment, and effective resource allocation (Freiberg, Rogers, and Serafeim 2020). This commitment signals a *desirable* and genuine dedication to addressing significant ESG challenges and captures stakeholders' attention (Khan, Serafeim, and Yoon 2016). Furthermore, research in accounting shows that a portfolio of firms with good ratings on material ESG issues has a significantly higher stock returns than a portfolio of firms with poor ESG ratings on the same issues (Khan, Serafeim, and Yoon 2016).

In summary, we argue that when firms emphasize nonmaterial ESG factors, it is perceived by investors as a negative signal, indicating potential cost disadvantage, inefficiencies in resource allocation, and managerial attention (Ocasio and Joseph 2005), leading to a lower

firm value. On the flip side, when firms emphasize material ESG issues, investors perceive it as a positive signal, leading to a higher firm value. Thus:

H_{1a}: Nonmaterial ESG emphasis has a negative impact on firm value.

H_{1b}: Material ESG emphasis has a positive impact on firm value.

Asymmetric Effect of Nonmaterial and Material ESG on Firm Value

In examining the contrasting effects (negative vs. positive) of nonmaterial versus material ESG emphasis on firm value, it is crucial to recognize the inherent asymmetry in these impacts. Specifically, a unit increase in nonmaterial ESG emphasis may lead to a more pronounced negative effect than the positive effect from the same unit increase in material ESG emphasis. This phenomenon aligns with Rozin and Royzman's contention (2001, p. 310) that negativity tends to exert a stronger influence, resulting in evaluations that lean more negatively than expected based solely on individual subjective valuations. Previous research underscores the dominance of negativity in decision-making processes (Baumeister et al. 2001; Ito et al. 1998; Rozin and Royzman 2001; Vaish, Grossmann, and Woodward 2008). For instance, empirical studies have demonstrated that negative attribute performance holds a more substantial sway over overall satisfaction and repurchase intentions than positive attribute performance (Mittal, Ross, and Baldasare 1998), and customer dissatisfaction wields a greater impact on short selling compared to customer satisfaction (Malshe, Colicev, and Mittal 2020). Consequently, considering the interplay of signaling theory and the dominance of negativity, the adverse effects stemming from nonmaterial ESG factors on firm value might conceivably outweigh the positive effects of material ESG factors. This proposition is in line with prospect theory (Kahneman and Tversky 1979), which posits that losses loom larger than gains. Thus:

H_2: The negative impact of nonmaterial ESG emphasis on firm value is greater than the positive impact of material ESG emphasis on firm value.

Moderating Role of Time

Signaling theory suggests investors enhance signal interpretation over time (Kromidha and Li 2019), honing the skill to extract influential information for future cash flows (Krueger, Sautner, and Starks 2020). Therefore, time increases the *observability* of the signal. Signals provide snapshots of unobservable sender quality at specific moments (Davila, Foster, and Gupta 2003), yet in dynamic environments, both sender and receiver information constantly change. Over the past decade, materiality has gained prominence (Freiberg, Rogers, and Serafeim 2020), with ESG and SASB displaying an increasing trend (see Web Appendix D, Figure 1 and 2), reflecting heightened awareness. This heightened awareness prompts investors to expect managers to better differentiate between material and nonmaterial ESG factors. In other words, we expect that over time the strength of the negative (vs. positive) signal, represented by the emphasis on nonmaterial (vs. material) ESG factors, will become more *observable*, leading to a greater negative (vs. positive) impact on firm value. Therefore, we argue that time acts as a moderator of the impact of nonmaterial and material ESG emphasis on firm value. Thus:

H_{3a}: The negative impact of nonmaterial ESG emphasis on firm value becomes stronger over time.

H_{3b}: The positive impact of material ESG emphasis on firm value becomes stronger over time.

Moderating Role of Regulation

As emphasized in the signaling theory, *desirability* is essential for informative signaling to investors and achieving desired outcomes (Berger 2019). Investors of regulated firms typically expect stable returns and dividends. For example, Impson (1997) found that public utilities' dividend decreases prompted stronger negative stock market reactions than similar announcements by unregulated firms. Investors of regulated firms may *desire* signals from firms' managers that they are engaging in activities that do not change the stable risk profiles of their firms. We argue that nonmaterial ESG emphasis of regulated firms may provide investors with a strong signal that their cashflows may not be stable. First, regulated sectors possess high entry barriers (Parker and Kirkpatrick 2012; Stigler 1971), safeguarding the firms operating in these sectors from disruptive newcomers. As such, they might not prioritize market-based assets such as strong brands, enhanced customer satisfaction, or radical innovations, since their industry position is relatively secure. Nonmaterial ESG factors, typically aimed toward stakeholders such as customers and employees to improve a firm's reputation, are costly to implement, and their benefits, such as a better firm reputation, are uncertain and likely to accrue only in the long term. Furthermore, a higher reputation among customers and employees may not significantly raise entry barriers beyond existing high levels.

Second, pricing control on regulated firms (e.g., utilities) lowers their flexibility to adjust prices based on market dynamics, often leading to narrower profit margins. The immediate costs of nonmaterial ESG emphasis will likely erode the already low margins resulting in lower cashflows. Therefore, investors will likely consider regulated firms' nonmaterial ESG emphasis to be a strong negative signal. In contrast, emphasizing the material ESG signals effective resource allocation (Freiberg, Rogers, and Serafeim 2020), foster better relations with regulators

(Freedman and Stagliano 1991; Shane and Spicer 1983), and aid firms in gaining positive media coverage and favorable treatment from policymakers (Brown, Helland, and Smith 2006). This reinforces investors' confidence in expected returns and strengthens the positive signal. Thus:

H_{4a}: The negative impact of nonmaterial ESG emphasis on firm value is stronger for the firms operating in regulated industries.

H_{4b}: The positive impact of material ESG emphasis on firm value is stronger for the firms operating in regulated industries.

Methodology

Data

To test our hypotheses, we employed two key resources: earnings call transcripts and ESG-BERT, a fine-tuned pre-trained language mode. Although several third-party agencies (such as Sustainalytics and Refinitiv) provide ESG ratings, we extracted them from earnings call transcripts due to concerns about the reliability and lack of standardized methodology in third-party agencies' ratings (Tayan et al. 2022, Berg, Koelbel, and Rigobon 2022). We specifically chose to analyze earnings call transcripts for three reasons. First, earnings calls are a crucial source of firsthand ESG information, allowing firms to demonstrate their commitment to sustainability 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 in formal reports or public statements (e.g., Brown, Hillegeist, and Lo 2004).

Second, studies have shown that readily available ESG information (sustainability/ESG reports and ratings) may not meet investors' needs, primarily because of variations in firms' compliance with disclosure requirements and discretionary interpretations of material information

(Diouf and Boiral 2017; Junior, Best, and Cotter 2014; Schiehll and Kolahgar 2021). Third, concern is growing about relying solely on data sets such as KLD, which prior research has extensively used (Serafeim and Yoon 2022). The inclusion of KLD data for ESG studies beyond 2010 poses challenges because of the discontinuation of KLD and the cessation of data collection efforts (Eccles, Lee, and Stroehle 2020). By using earnings calls transcripts, we resolve all three problems.

We obtain conference call transcripts from WRDS spanning 2005 and 2021 across 67 SASB industries.[6] 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, and we identified material and nonmaterial factors for a given industry using the current SASB materiality map (see the Web Appendix A). Our final sample consists of 6,730 firms and 44,570 firm-year observations over 17 years.

Measures

Focal independent construct. We use two focal independent variables: material ESG emphasis and nonmaterial ESG emphasis. We extract the material and nonmaterial emphasis from the text of earnings call transcripts using ESG-BERT (Mukherjee 2020). This model is specifically trained to analyze and understand text data related to ESG topics. It uses a pretrained BERT (Devlin et al. 2019) model that was further pretrained on the sustainable investing text corpus, resulting in a domain-specific model (Mukherjee 2020). ESG-BERT demonstrated accuracies of 100% and 98% for next sentence prediction and masked language modeling tasks, respectively (for original BERT tasks, see Devlin et al. 2019). Fine-tuning ESG-BERT for text classification

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

yielded an F-1 score of .90,[7] suggesting that the model demonstrated a high level of accuracy and precision in identifying our 26 ESG metrics. For comparison, the general BERT (BERT-base) model scored .79 after fine-tuning, and the standard machine learning-based models scored .67 (Mukherjee 2020),[8] confirming the superiority of our model in classifying ESG text. Using ESG-BERT, we extracted data on 26 different metrics related to ESG (see the Web Appendix A for details). Next, we leverage the SASB industry mapping to classify these 26 ESG factors into nonmaterial or material.

Adhering to the same criteria employed by the Securities and Exchange Commission, the SASB discerns material factors such as those attracting extensive interest of investors and bearing financial implications. Global investors seek comparable, standardized data to assess companies' handling of sustainability risks and opportunities. SASB Standards, tailored for investors, address this need with industry-based, metric-driven focus on cash flows, finance access, and cost of capital.[9] They enable integrating sustainability into global investment decisions and provide comparable data to the analytics ecosystem. Leading international investors endorse SASB Standards as a fundamental way for companies to communicate industry-based sustainability information.[10] They utilize SASB Standards across markets, asset classes, and strategies to integrate sustainability into investment decisions. Furthermore, academic research has extensively utilized these standards to study materiality (Khan, Serafeim, and Yoon 2016; Clark and Lalit 2020; Consolandi, Eccles, and Gabbi 2020).

[7] The F-1 score is a value between 0 and 1, with 1 indicating perfect performance. This score is commonly used in classification tasks to assess a model's accuracy and precision.
[8] The author does not specify which machine learning models are used. However, he mentions using scikit-learn library in Python, which contains models such as support vector machines and random forest.
[9] See https://sasb.org/standards/
[10] See https://sasb.org/investor-use/supporters/

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 a nonmateriality and materiality score for each firm-year individually for 26 ESG factors. 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 takes into account 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 (Huang, Liu, and Xie 2020; Saboo and Grewal 2013; Vadakkepatt et al. 2022; Yadav, Prabhu, and Chandy 2007). 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. Likewise, the word "increase" can have positive or negative connotations depending on whether it is used to describe profits or costs (Li 2010).

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 on the basis of the presence of 26 specific ESG factors, assigning a 1 or 0 accordingly. By comparing the number of sentences addressing 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:

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

To calculate material ESG emphasis, we aggregated the total number of sentences corresponding to the material ESG factors (as per SASB) for that industry in that year scaled by the total number of sentences. 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: Tobin's q. Following previous research, we use Tobin's q as a measure of firm value (Malshe and Agarwal 2015). Tobin's q reflects the stock of a company's tangible and intangible assets by considering the relationship between the replacement cost of the company's tangible assets and the company's market value. We use the log of Tobin's q following the theoretical and empirical justifications of Hirsch and Seaks (1993).

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 counter variable has a value of 16 for year 2021.

Moderating variable: Regulated industry. We classify financial service firms (Standard Industrial Classification [SIC] codes 6000–6999) and regulated utilities (SIC code 4900) as regulated industries (Grullon, Michenaud, and Weston 2015) under a high degree of regulatory oversight (1). We classify all other industries as nonregulated (0).

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), to account for firm-specific factors. In addition, we incorporate *cash flow* 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 *market share* and *industry concentration* as control variables, as both are associated with firm value. Market share is a measure of a firm's relative market presence and has a positive effect on firm value (Anderson, Fornell, and Mazvancheryl 2004). Following prior work (Luo, Homburg, and Wieseke 2010), we measure industry concentration using the Herfindahl–Hirschman index (HHI), which indicates industry concentration based on firms' market shares. 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.

Table 2 summarizes all our measures and control variables. Figure 2 depicts the temporal variation in both material and nonmaterial 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 (refer to Figure 2), coinciding with significant events like the emergence of stakeholder capitalism discussions at Business Roundtable in 2019,[11] and at Davos in 2020.[12] Figure 3 highlights sector-specific variations, with Infrastructure and Services exhibiting high asymmetry and Technology and Communications showing a more balanced emphasis.

[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/

Table 2. Measures and Data Sources

Variable	Definition	Data Source	Supporting Literature
Dependent Variable			
Firm value (Tobin's 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	Malshe and Agarwal (2015)
Focal Intendent Variables			
Material ESG emphasis	Ratio of material ESG sentences to total sentences	Earnings call transcripts	This study
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
Industry regulation	Financial services firms (SIC codes 6000–6999) and regulated utilities (SIC code 4900) are classified as regulated industries (1); all other industries are classified as nonregulated (0).	COMPUSTAT	Grullon, Michenaud, and Weston (2015)
Control Variables			
Industry concentration	HHI	COMPUSTAT	Luo, Homburg, and Wieseke 2010
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 share	Market share of the firm	COMPUSTAT	Anderson, Fornell, and Mazvancheryl (2004)
Cash flow	Firm's cash flows scaled by 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)

Figure 2. Material and nonmaterial ESG emphasis over time in earnings call

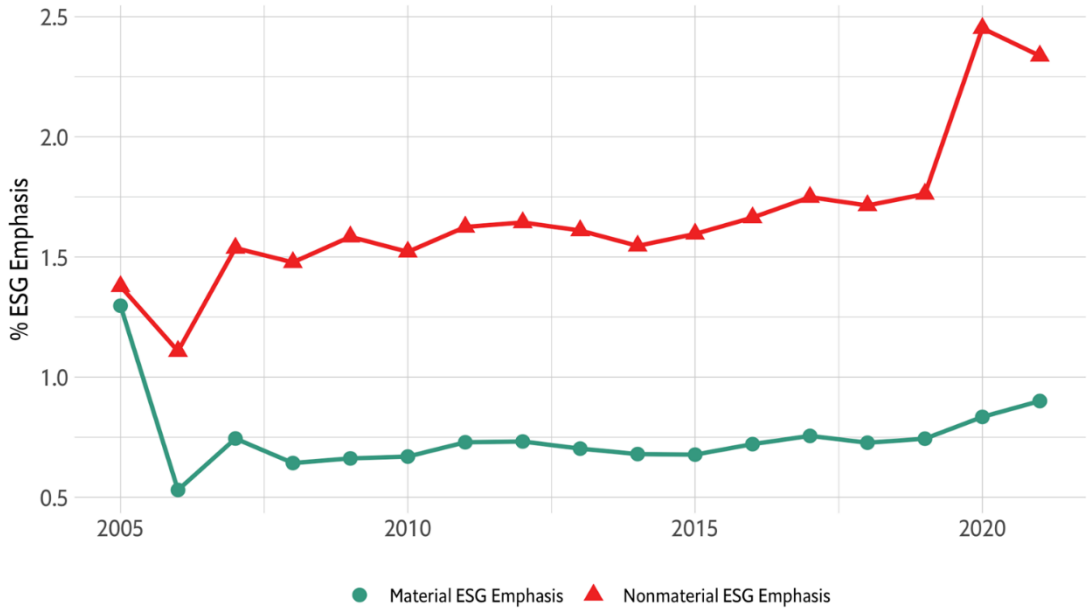
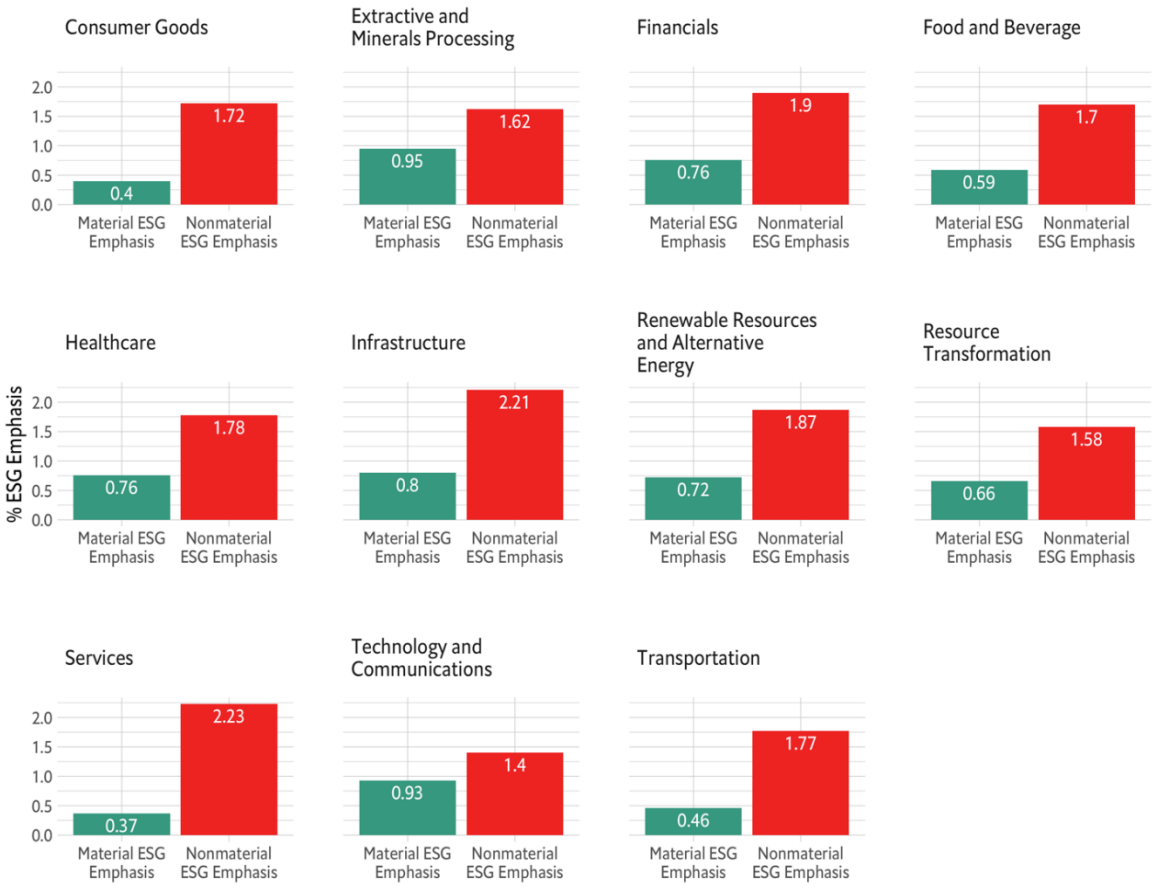


Figure 3. Material and nonmaterial ESG emphasis for various SASB sectors



Figures 4A, 4B, and 4C 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. In contrast, Microsoft has maintained a consistent track record in both material and nonmaterial ESG issues. 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 sustaining its leadership in sustainable business practices for over two decades.[13] Similarly consistent material

[13] https://www.etftrends.com/esg-channel/esg-in-action-a-conversation-with-microsoft-and-the-environmental-defense-fund/

emphasis from Bank of America (see Figure 4C) echoes their CEO's statement that “we are capitalists” (Nguyen and Anand 2023). 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, Nguyen, and Azhar 2022).

Figure 4A. Material and nonmaterial ESG emphasis for Nike

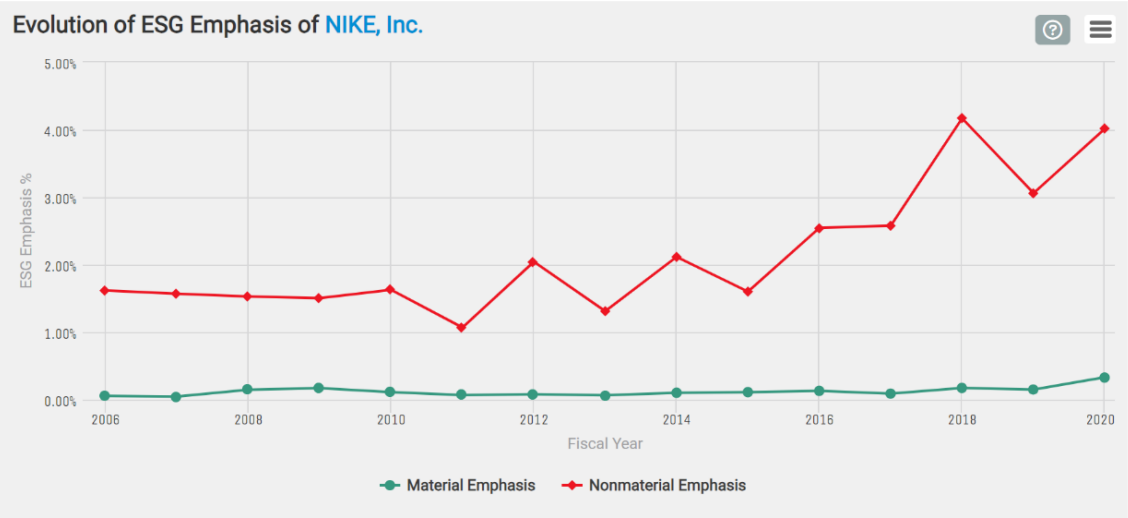


Figure 4B. Material and nonmaterial ESG emphasis for Microsoft

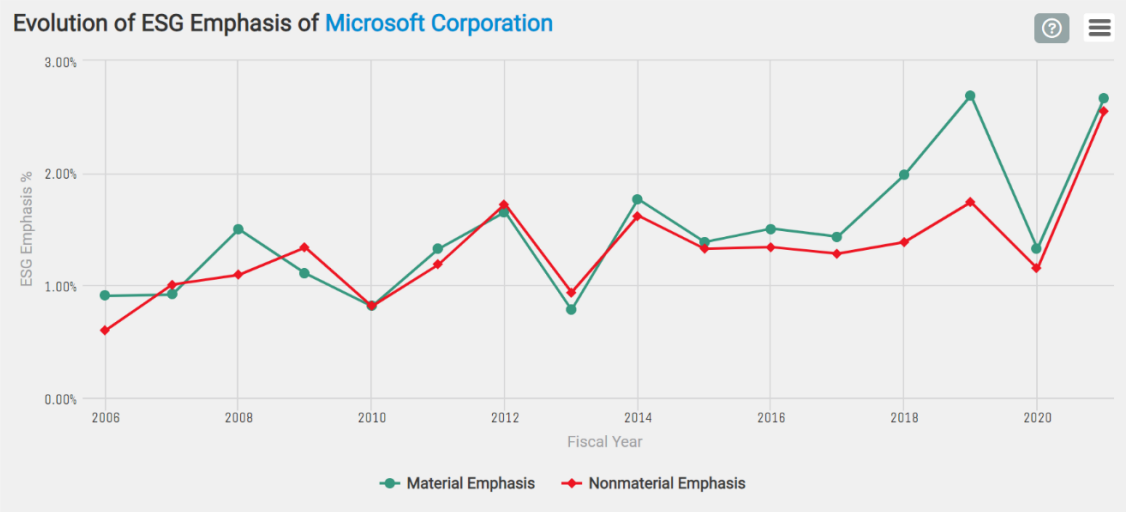


Figure 4C. Material and nonmaterial ESG emphasis for Bank of America

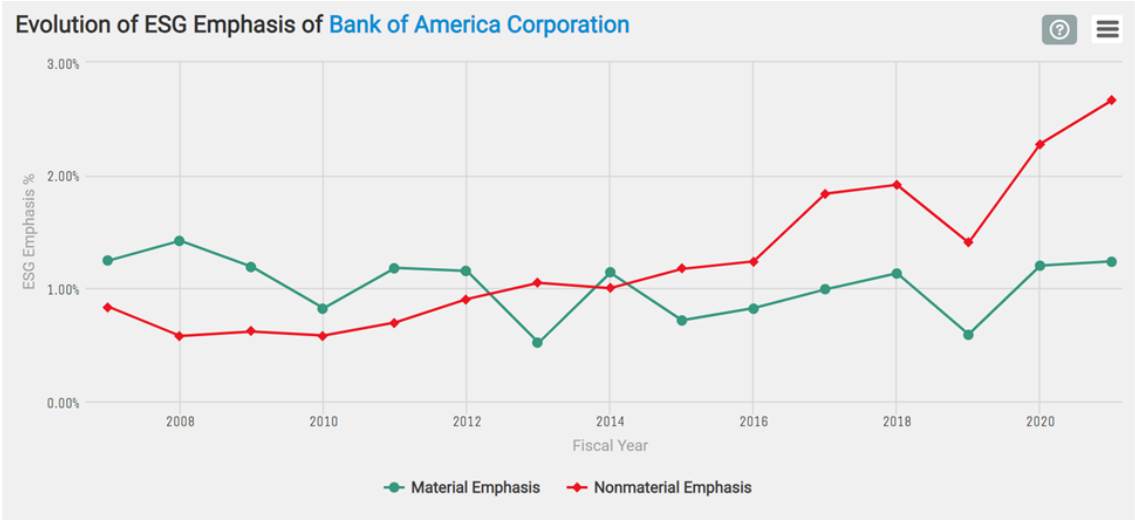


Table 3 shows the descriptive statistics and correlations for the focal and control variables. We include an extensive set of control variables to account for the variations of firm value due to the observed firm and industry variables (German, Ebbes, and Grewal 2015).

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, Kastrapeli, and Potter 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. Our model contains several control variables, but with the absence of variables associated with material ESG emphasis and nonmaterial ESG emphasis, potential identification concerns remain.

Table 3. Descriptive Statistics and Correlations

Variables	N	M	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Material ESG emphasis	44,570	.007	.007	1.000									
(2) Nonmaterial ESG emphasis	44,570	.017	.015	.316***	1.000								
(3) Firm value	44,570	1.585	1.644	.033***	-.037***	1.000							
(4) Firm leverage	44,570	.244	.23	-.051***	.018***	-.412***	1.000						
(5) Time elapsed	44,570	9.109	4.269	.068***	.148***	.084***	.050***	1.000					
(6) Cash flow	44,570	.057	.165	-.116***	-.097***	-.007	-.019***	-.071***	1.000				
(7) Profit margin	44,570	.07	.187	-.150***	-.100***	-.034***	.005	-.076***	.877***	1.000			
(8) Firm size	44,570	6.843	2.222	-.177***	-.210***	-.170***	.257***	.034***	.422***	.470***	1.000		
(9) Industry concentration	44,570	.225	.198	-.075***	.021***	.023***	-.081***	.015***	.044***	.075***	.042***	1.000	
(10) Market share	44,570	.093	.185	-.118***	-.052***	-.036***	.047***	.013***	.112***	.152***	.393***	.567***	1.000
(11) R&D intensity	44,570	2.331	100.402	.014***	.003	.026***	-.018***	.007	-.091***	-.089***	-.105***	-.009**	-.012**

***$p < .01$, **$p < .05$, *$p < .1$.

Therefore, we use the control function approach to address potential endogeneity (Malshe, Colicev, and Mittal 2020). We introduce two new variables, corresponding to material and nonmaterial 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 (Malshe, Colicev, and Mittal 2020; Sridhar et al. 2016), we followed a two-step methodology for the correction estimate of control functions. First, we regressed material and nonmaterial ESG emphasis on a set of predetermined control variables and instruments. We use the average material ESG emphasis and nonmaterial ESG emphasis of peer firms as instruments for material ESG emphasis and nonmaterial 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, Ebbes, and Grewal 2015).

Scholars have emphasized two key criteria when using instruments. First, the instruments should be relevant, meaning that they are conceptually related with 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 using peer instruments to meet both relevancy and exclusion criteria (Germann, Ebbes, and Grewal 2015), we propose to use peer firms' ESG emphasis as instruments. In terms of relevancy, we maintain that both focal firms 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, Ebbes, and Grewal 2015). Consequently, our instrument satisfies the exclusion restriction. Specifically, we estimate the following auxiliary regressions:

$$ESGMAT_{i,t} = \theta_0 + \tilde{\theta} CTRL_{i,t} + \theta_1 PEER\_ESGMAT_{i,t} + \theta \sum YDUMMY_{i,t} + \text{CF\_}Mat_{\text{i,t}}, \quad (4a)$$

$$ESGNONMAT_{i,t} = \mu_0 + \tilde{\mu} CTRL_{i,t} + \mu_1 PEER\_ESGNONMAT_{i,t} + \mu \sum YDUMMY_{i,t} + \text{CF\_}NonMat_{\text{i,t}}, \quad (4b)$$

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

Model Specification and Estimation

To examine the impact of material and nonmaterial ESG on firm value and the moderating role of time and industry regulation, we define our empirical model using Equation 3. However, a firm's material and nonmaterial ESG factors are likely to be endogenous because firms may strategically participate in different ESG activities. Therefore, we use a control function approach to address endogeneity concerns. We include these corrections in our main model specified in Equation 3:

$$FV_{\text{i,t+1}} = \beta_0 + \beta_1 ESGMAT_{i,t} + \beta_2 ESGNONMAT_{i,t} + \beta_3 REG_{i,t} + \beta_4 TIME\_ELAPSED_{i,t} + \beta_4 REG_{i,t}\ X\ ESGMAT_{i,t} + \beta_5 REG_{i,t}\ X\ ESGNONMAT_{i,t} + \beta_6 TIME\_ELAPSED_{i,t}\ X\ ESGMAT_{i,t} + \beta_7 TIME\_ELAPSED_{i,t}\ X\ ESGNONMAT_{i,t} + \beta_8 \text{CF\_}Mat_{\text{i,t}} + \beta_9 \text{CF\_}NonMat_{\text{i,t}} + \tilde{\beta} CTRL_{i,t} + \beta \sum YDUMMY_{i,t} + \varepsilon_{i,t} \quad (3)$$

where, for each firm i and year t, $FV_{,it}$ is the natural log of Tobin's q, $ESGMAT_{it}$ is the natural log of material ESG emphasis, $ESGNONMAT_{it}$ is the natural log of nonmaterial ESG emphasis, REG_t is the dummy to identify the regulated or nonregulated industry, $TIME\_ELAPSED_t$ is an increasing counter with the value 0 for the year 2005 incrementing by 1 through 2021, $CTRL1_t$ represents all the control variables, $CF\_Mat_{i,t}$ and $CF\_NonMat_{i,t}$ 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 FV.

Results

In Column 1, Table 4, we report the results of Model 1 which includes aggregated ESG emphasis as the independent variable. The coefficient of ESG emphasis is nonsignificant (.016, $p > .1$), underscoring the need to examine material and nonmaterial ESG emphasis separately. The remaining columns in Table 4 report the results of the estimation of Equation 3. Model 2 includes only material and nonmaterial ESG emphasis and controls and serves as a baseline. Model 3 adds the interaction terms to Model 2 and is our full model.

Test of hypotheses. In Column 2, Table 4, we report the results of Model 2. We find that whereas the coefficient of material ESG emphasis is positive and significant (.147, $p < .05$), the coefficient of nonmaterial ESG emphasis is negative and significant (–.314, $p < .01$). In Column 3, Table 4, we report the results of Model 3. We use the results from this model to test all the hypotheses. The material ESG emphasis is positively associated with firm value (.141, $p < .05$), and nonmaterial ESG emphasis is negatively associated with firm value (–.299, $p < .01$). Thus, we find support for H_{1a} and H_{1b}. Statistical comparison 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| = .16, $p < .001$). This result

provides support for H_2. The interaction of nonmaterial ESG emphasis with time is negative and significant (–.003, $p < .05$), which supports H_{3a}. Figure 5 shows the Johnson–Neyman plot, which is consistent with the hypothesized relationship in H_{3a}. The shaded area signifies a 95% confidence interval band. However, the interaction of material ESG emphasis with time is negative but non-significant (–.0002, $p > .1$). Therefore, we did not find support for H_{3b}. We speculate that as investors have been paying attention to material ESG emphasis for a long time, there may not be a significant increase in its observability as a signal of firm priorities.

H_{4a} posits that the negative impact of nonmaterial ESG emphasis on firm value is stronger in regulated industries. The results show that the interaction effect of nonmaterial ESG emphasis and regulation on firm value is negative and significant (-.034, $p < .01$). The negative interaction effect of nonmaterial ESG emphasis and regulation on firm value suggests that regulation strengthens the negative impact of nonmaterial ESG emphasis on firm value, in support of H_{4a}. Similarly, we find that the interaction effect of material ESG emphasis and regulation on firm value is positive and significant (.029, $p < .05$), in support of H_{4b}.

The effects of control variables are generally in the expected directions. Financial leverage (-.322, $p < .01$) and firm size (-.06, $p < .01$) have significantly negative impacts on Tobin's q. Leveraged firms and large firms have lower growth options, resulting in lower Tobin's q. Industry concentration has a positive and marginally significant impact on Tobin's q (.078, $p < .1$). Due to lower competition in concentrated industries, firms can capture a higher proportion of value. Finally, we find an unexpected and small negative effect of R&D intensity (-.0001, $p < .01$). All the other control variables are nonsignificant. As regulated firms dummy is time invariant, its main effect is eliminated due to the fixed effects.

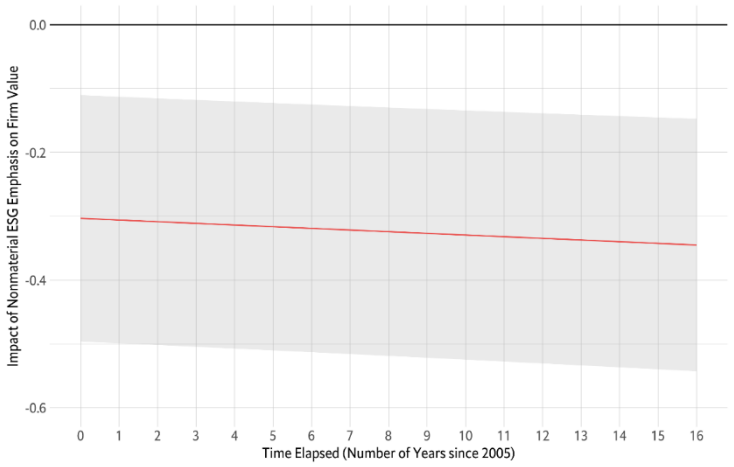
Table 4. Impact of Material and Nonmaterial ESG on Firm Value

	(1) Firm Value		(2) Firm Value		(3) Firm Value	
ESG emphasis	.016	(.145)				
Nonmaterial ESG emphasis			-.314***	(.099)	-.299***	(.098)
Material ESG emphasis			.147**	(.062)	.141**	(.062)
Nonmaterial ESG emphasis × time elapsed					-.003**	(.001)
Material ESG emphasis × time elapsed					-.0002	(.001)
Nonmaterial ESG emphasis × regulation					-.034***	(.012)
Material ESG emphasis × regulation					.029***	(.008)
Time elapsed	-.011**	(.005)	-.007*	(.004)	-.019***	(.007)
Firm leverage	-.346***	(.023)	-.323***	(.021)	-.322***	(.021)
Cash flow	.017	(.033)	.026	(.033)	.027	(.033)
Profit margin	.031	(.030)	.029	(.030)	.030	(.030)
Firm size	-.036***	(.013)	-.058***	(.011)	-.060***	(.011)
R&D intensity	-.000	(.000)	-.0001**	(.000)	-.0001***	(.000)
Industry concentration	.070	(.046)	.074*	(.044)	.078*	(.044)
Market share	-.069	(.045)	-.070	(.045)	-.073	(.045)
Ctr. function for ESG emphasis	-.028	(.145)				
Ctr. function for material ESG emphasis			-.146**	(.063)	-.143**	(.062)
Ctr. function for nonmaterial ESG emphasis			.299***	(.099)	.311***	(.099)
Constant			1.001**	(.456)	1.052**	(.456)
No. of obs.	39,673		39,673		39,673	
Adjusted-R^2	.092		.094		.094	
Year fixed effects	Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes	
Firm fixed effects	Yes		Yes		Yes	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. Elimination of coefficient of regulation due to fixed effects model.

*$p < .10$, **$p < .05$, ***$p < .01$.

Figure 5. Johnson–Neyman analysis for the Moderating Effect of Time



Robustness Checks

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 B1 (see Web Appendix B). 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.

Alternative measure of firm value. In our primary model, we use Tobin's q as a measure of firm value (Malshe and Agarwal 2015). Recently, Bendle and Butt (2018) argued that intangible assets should be removed from the total assets when calculating Tobin's q. Accordingly, we performed our analysis using their suggested alternative measure of Tobin's q. Our results are robust as presented in Table B2 (see Web Appendix B).

App Implementation

Our data set 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 material and nonmaterial 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 in the same fiscal year, and (3) quantify the impact of changes in material

and nonmaterial ESG emphasis on firm value. We facilitated these tasks by creating a web app (https://esg-analytics.shinyapps.io/ESG-Emphasis-Finder/) rather than providing the raw data, which can be difficult to manage for executives lacking a background in data analytics.

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 material and nonmaterial 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 visualization 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 Tobin's q and the change in Tobin's q compared with its current value. Executives can use this

visualization to map multiple scenarios on the basis of different emphases on material and nonmaterial 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.

Discussion

The main goal of this study was to show that nonmaterial ESG emphasis hurts firm value. We test our theoretical framework, which draws on signaling theory, using data from earnings call transcripts. We provide guidance for managers on (1) how material and nonmaterial ESG emphasis relates to firm value, (2) how time and industry regulation affects this relationship, and (3) how to make informed decisions, optimize their ESG strategy, and align their firm's sustainability efforts with its performance goals through our web app.

Research Contributions

Our study makes several contributions to research on ESG and CSR. First, it provides the first empirical evidence that ESG emphasis may have a negative impact on firm value. We exploit industry heterogeneity to show that material and nonmaterial ESG factors have significant and asymmetric effects on firm value. Specifically, a 1% increase in material ESG can lead to a .14% increase in firm value. More important, a 1% increase in nonmaterial ESG can *decrease* firm value by .3%. Our finding that nonmaterial ESG emphasis has a negative impact on firm value is novel to the literature on ESG.[14] This finding underscores the need for future studies to consider

[14] 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. Furthermore, they estimate a fixed effects panel model with lagged dependent variable, while ignoring endogeneity arising from correlation between lagged dependent variables and the error term.

both material and nonmaterial 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, we explore how industry regulation and time moderates the impact various ESG factors on financial performance. Our study addresses the call made by Serafeim and Yoon (2022) to comprehensively understand the complex and evolving nature of ESG factors. By investigating the impact of ESG factors over time and by regulation using a novel data set, we contribute to a deeper understanding of the relationship between ESG factors and financial outcomes, bridging the knowledge gap and advancing the field.

Third, construction of a novel data set 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 beyond the KLD data set. 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 data sets (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 contribute to the current call for papers on research-driven apps in the Journal of Marketing. 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.

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 positive and negative impact of material and nonmaterial ESG factors, providing executives with guidance on how to strike a balance between ESG initiatives and performance to both satisfy other stakeholders and safeguard financial stability.

Our research reveals that the negative impact of emphasizing nonmaterial ESG factors is 212% higher than the positive effect of material ESG factors on firm value. 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.

Second, our research reveals that the negative impact of nonmaterial ESG factors intensifies 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 firms' 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 industry regulations in strengthening the positive and negative impact of material and nonmaterial ESG, respectively, on firm value. It

underscores the vital role that industry regulations play in shaping the positive and negative effects of these factors. Our findings indicate that increased regulation offers more than just enhanced returns on investments related to material ESG. It also brings about a significant implication: companies engaging in nonmaterial ESG for broader societal stakeholders face heightened consequences from investors. Regulators can leverage these insights to enhance existing frameworks, collaborating with industry for robust material ESG solutions, while accounting for nonmaterial risks. This approach can yield targeted and potent regulations, fostering sustainable business practices.

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 assists executives and investors gain access to a user-friendly platform that supports their decision-making processes and helps them understand the impact of potential ESG initiatives on firm value.

Limitations and Future Research Directions

Our study reveals promising avenues for future research on material and nonmaterial ESG factors. While we focus on nonmaterial ESG factors' impact on firm value, it's 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 delve into the dynamic nature of these factors. Future studies could explore how firms adapt to evolving material ESG factors, ensuring long-term performance and sustainability.

Second, 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 delve into these mechanisms, drawing on insights from the marketing-finance literature, which emphasizes the importance of comprehending the direct effects and underlying relationships (Edeling, Srinivasan, and Hanssens 2021; Malshe, Colicev, and Mittal 2020; Malshe et al. 2023). Future research could delve into these mechanisms to unravel the intricacies of how material and nonmaterial ESG factors influence firm value, thereby providing valuable insights for effective decision making and strategy implementation.

Third, existing frameworks like SASB and Global Reporting Initiative may not fully align with each firm's priorities, as they cater to specific stakeholders. Relying on established taxonomies can create blind spots for investors and analysts. Research shows that sustainability data materiality varies across firms, even within the same industry or subindustry (Serafeim and Yoon 2022). For example, two technology companies may emphasize different ESG factors due to their distinct operations and risks. Future research can help identify material ESG factors that align with individual firms' unique circumstances, enabling more precise and effective ESG strategies.

Finally, as ESG regulations and standards have been evolving rapidly, we do not consider the possibility that some companies may strategically signal their emphasis on material and nonmaterial ESG to investors. Future research could explore modeling strategic signaling of nonmaterial and material ESG emphasis to better understand how managers should be making these strategic choices in a more stable regulatory environment.

References

Amel-Zadeh, Amir and George Serafeim (2018), "Why and How Investors use ESG Information: Evidence from a Global Survey," *Financial Analysts Journal*, 74 (3), 87–103.

Anderson, Eugene W., Claes Fornell, and Sanal K. Mazvancheryl (2004), "Customer Satisfaction and Shareholder Value," *Journal of Marketing*, 68 (4), 172–85.

Aupperle, Kenneth E., Archie B. Carroll, and John D. Hatfield (1985), "An Empirical Examination of the Relationship Between Corporate Social Responsibility and Profitability," *Academy of Management Journal*, 28 (2), 446–63.

Bai, Xiong, Jinmian Han, Yuanzhi Ma, and Wenrui Zhang (2022), "ESG Performance, Institutional Investors' Preference and Financing Constraints: Empirical Evidence From China," *Borsa Istanbul Review*.

Barnett, Michael L. (2007), "Stakeholder Influence Capacity and the Variability of Financial Returns to Corporate Social Responsibility," Academy of Management Review, 32 (3), 794–816.

Baumeister, Roy F., Ellen Bratslavsky, Catrin Finkenauer, and Kathleen D. Vohs (2001), "Bad Is Stronger Than Good," *Review of General Psychology*, 5 (4), 323–70.

Bendle, Neil Thomas and Moeen Naseer Butt (2018), "The Misuse of Accounting-Based Approximations of Tobin's q in a World of Market-Based Assets," *Marketing Science*, 37 (3), 484–504.

Berg, Florian, Julian F. Koelbel, and Roberto Rigobon (2022), "Aggregate Confusion: The Divergence of ESG Ratings," *Review of Finance*, 26 (6), 1315–44.

Berger, Joël (2019), "Signaling Can Increase Consumers' Willingness to Pay for Green Products. Theoretical Model and Experimental Evidence," *Journal of Consumer Behavior*, 18 (3), 233–46.

Bergh, Donald D., Brian L. Connelly, David J. Ketchen Jr., and Lu M. Shannon (2014), "Signalling Theory and Equilibrium in Strategic Management Research: An Assessment and a Research Agenda," *Journal of Management Studies*, 51 (8), 1334–60.

Bolton, Patrick and Marcin T. Kacperczyk (2020), "Carbon Premium Around the World," NBER Working Paper No. 26968.

Brown, William O., Eric Helland, and Janet Kiholm Smith (2006), "Corporate Philanthropic Practices," *Journal of Corporate Finance*, 12 (5), 855–77.

Brown, Stephen, Stephen A. Hillegeist, and Kin Lo (2004), "Conference Calls and Information Asymmetry," *Journal of Accounting and Economics*, 37 (3), 343-66.

Clark, Casey and Harshad Lalit (2020), "ESG Improvers: An Alpha Enhancing Factor," https://rcm.rockco.com/wpcontent/uploads/2020/09/ESG-Improvers-Whitepaper.pdf (August 8)

Connelly, Brian L., S. Trevis Certo, R. Duane Ireland, and Christopher R. Reutzel (2011), "Signaling Theory: A Review and Assessment," *Journal of Management*, 37 (1), 39–67.

Consolandi, Costanza, Robert G. Eccles, and Giampaolo Gabbi (2022), "How Material is a Material Issue? Stock Returns and the Financial Relevance and Financial Intensity of ESG Materiality," *Journal of Sustainable Finance & Investment*, 12 (4), 1045–68.

Davila, Antonio, George Foster, and Mahendra Gupta (2003), "Venture Capital Financing and the Growth of Startup Firms," *Journal of Business Venturing*, 18 (6), 689–708.

Devlin, Jacob, Ming-Wei Chang, Kenton Lee, and Kristina Toutanova (2019), "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding," In Proceedings of the Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 (Long and Short Papers). *Association for Computational Linguistics*, Minneapolis, Minnesota, 4171–86.

Diouf, Dominique and Olivier Boiral (2017), "The Quality of Sustainability Reports and Impression Management: A Stakeholder Perspective," *Accounting, Auditing & Accountability Journal*, 30 (3), 643-67.

Eccles, Robert G., Ioannis Ioannou, and George Serafeim (2014), "The Impact of Corporate Sustainability on Organizational Processes and Performance," *Management Science*, 60 (11), 2835–57.

Eccles, Robert G. and Mirtha D. Kastrapeli (2017), *The Investing Enlightenment: How Principles and Pragmatism Can Create Sustainable Value Through ESG*. State Street.

Eccles, Robert G., Mirtha D. Kastrapeli, and Stephanie J. Potter (2017), "How to Integrate ESG into Investment Decision-Making: Results of a Global Survey of Institutional Investors," *Journal of Applied Corporate Finance*, 29 (4), 125–33.

Eccles, Robert G., Linda-Eling Lee, and Judith C. Stroehle (2020), "The Social Origins of ESG: an Analysis of Innovest and KLD," *Organization & Environment*, 33 (4), 575–96.

Eccles, Robert G. and George Serafeim (2013), "A Tale of Two Stories: Sustainability and the Quarterly Earnings Call," *Journal of Applied Corporate Finance*, 25 (3), 8–19.

Edeling, Alexander, Shuba Srinivasan, and Dominique M. Hanssens (2021), "The Marketing–Finance Interface: A New Integrative Review of Metrics, Methods, and Findings and an Agenda for Future Research," *International Journal of Research in Marketing*, 38 (4), 857–76.

Fama, Eugene F. and Kenneth R. French (2007), "The Anatomy of Value and Growth Stock Returns," *Financial Analysts Journal*, 63 (6), 44–54.

Fombrun, Charles and Mark Shanley (1990), "What's in a Name? Reputation Building and Corporate Strategy," *Academy of Management Journal*, 33 (2), 233–58.

Freedman, Martin and A. J. Stagliano (1991), "Differences in Social-Cost Disclosures: A Market Test of Investor Reactions," *Accounting, Auditing & Accountability Journal*, 4 (1).

Freiberg, David, Jean Rogers, and George Serafeim (2020), "How ESG Issues Become Financially Material to Corporations and their Investors," *Harvard Business School Accounting & Management Unit Working Paper*, (20–056).

Friedman, Milton (1970), "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy,* 78 (2), 193–238.

Germann, Frank, Peter Ebbes, and Rajdeep Grewal (2015), "The Chief Marketing Officer Matters!" *Journal of Marketing*, 79 (3), 1–22.

Gretz, Richard T., Ashwin Malshe, Carlos Bauer, and Suman Basuroy (2019), "The Impact of Superstar and Non-Superstar Software on Hardware Sales: The Moderating Role of Hardware Lifecycle," *Journal of the Academy of Marketing Science*, 47 (3), 394–416.

Grewal, Jody, Clarissa Hauptmann, and George Serafeim (2021), "Material Sustainability Information and Stock Price Informativeness," *Journal of Business Ethics*, 171, 513–44.

Grewal, Jody, George Serafeim, and Aaron Yoon (2016), "Shareholder Activism on Sustainability Issues," working paper, University of Toronto.

Grullon, Gustavo, Sébastien Michenaud, and James P. Weston (2015), "The Real Effects of Short-Selling Constraints," *Review of Financial Studies*, 28 (6), 1737–67.

Hadani, Michael and Douglas A. Schuler (2013), "In Search of El Dorado: The Elusive Financial Returns On Corporate Political Investments," *Strategic Management Journal*, 34 (2), 165–81.

Hillman, Amy J., Gerald D. Keim, and Douglas Schuler (2004), "Corporate Political Activity: A Review and Research Agenda," *Journal of Management*, 30 (6), 837–57.

Hirsch, Barry T. and Terry G. Seaks (1993), "Functional Form in Regression Models of Tobin's q," *The Review of Economics and Statistics*, 75 (2), 381–85.

Homburg, Christian, Marcel Stierl, and Torsten Bornemann (2013), "Corporate Social Responsibility in Business-to-Business Markets: How Organizational Customers Account for Supplier Corporate Social Responsibility Engagement," *Journal of Marketing*, 77 (6), 54–72.

Hong, Harrison and Marcin Kacperczyk (2009), "The Price Of Sin: The Effects Of Social Norms On Markets," *Journal of Financial Economics*, 93 (1), 15–36.

Huang, Chun-Yao, Ping-Yu Liu, and Shao-Ming Xie (2020), "Predicting Brand Equity by Text-Analyzing Annual Reports," *International Journal of Market Research*, 62 (3), 300–313.

Impson, Michael (1997), "Market Reaction to Dividend-Decrease Announcements: Public Utilities Vs. Unregulated Industrial Firms," *Journal of Financial Research*, 20 (3), 407–22.

Ito, Tiffany A., Jeff T. Larsen, N. Kyle Smith, and John T. Cacioppo (1998), "Negative Information Weighs More Heavily on The Brain: The Negativity Bias in Evaluative Categorizations," Journal of *Personality and Social Psychology*, 75 (4), 887–900.

Jebe, Ruth (2019), "The Convergence of Financial and ESG Materiality: Taking Sustainability Mainstream," *American Business Law Journal*, 56 (3), 645–702.

Jensen, Michael C. (2002), "Value Maximization, Stakeholder Theory, and the Corporate Objective Function," *Business Ethics Quarterly*, 12 (2), 235–56.

Junior, Renzo Mori, Peter J. Best, and Julie Cotter (2014), "Sustainability Reporting and Assurance: A Historical Analysis on a World-Wide Phenomenon," *Journal of Business Ethics*, 120, 1–11.

Kahneman, Daniel and Amos Tversky (1979), "On the Interpretation of Intuitive Probability: A Reply to Jonathan Cohen," *Cognition*, 7 (4), 409–11

Kang, Charles, Frank Germann, and Rajdeep Grewal (2016), "Washing Away Your Sins? Corporate Social Responsibility, Corporate Social Irresponsibility, and Firm Performance," *Journal of Marketing*, 80 (2), 59–79.

Khan, Mozaffar, George Serafeim, and Aaron Yoon (2016), "Corporate Sustainability: First Evidence on Materiality," *Accounting Review*, 91 (6), 1697–1724.

Kim, Eun-Hee and Thomas P. Lyon (2015), "Greenwash vs. Brownwash: Exaggeration and Undue Modesty in Corporate Sustainability Disclosure," *Organization Science*, 26 (3), 705–23.

Kolahgar, S. and E. Schiehll (2020), "Disclosing What Matters, Financially Material ESG Information and Stock Price Informativeness," in *International Corporate Governance Society–6th Annual Conference* (ICGS 2020).

Konar, Shameek and Mark A. Cohen (2001), "Does the Market Value Environmental Performance?" *Review of Economics and Statistics*, 83 (2), 281–89.

Kromidha, Endrit and Matthew C. Li (2019), "Determinants of Leadership in Online Social Trading: A Signaling Theory Perspective," *Journal of Business Research*, 97, 184–97.

Krueger, Philipp, Zacharias Sautner, and Laura T. Starks (2020), "The Importance of Climate Risks for Institutional Investors," *Review of Financial Studies*, 33 (3), 1067–1111.

Kuh, Thomas, Andre Shepley, Greg Bala, and Michael Flowers (2020), "Dynamic Materiality: Measuring What Matters," Truvalue Labs.

Larcker, David F., Brian Tayan, and Edward M. Watts (2022), "Seven Myths of ESG," *European Financial Management*, 28 (4), 869–82.

Lee (2021), "Living in a Material World: Myths and Misconceptions About 'Materiality,'" https://www.sec.gov/news/speech/lee-living-material-world-052421.

Li, Feng (2010), "Survey of the Literature," *Journal of Accounting Literature*, 29, 143–65.

Lo, Shih-Fang and Her-Jiun Sheu (2007), "Is Corporate Sustainability A Value-Increasing Strategy For Business?" *Corporate Governance: An International Review*, 15 (2), 345–58.

Luo, H. Arthur and Ronald J. Balvers (2017), "Social Screens and Systematic Investor Boycott Risk," *Journal of Financial and Quantitative Analysis*, 52 (1), 365–99.

Luo, Xueming and C.B. Bhattacharya (2006), "Corporate Social Responsibility, Customer Satisfaction, and Market Value," *Journal of Marketing*, 70 (4), 1–18.

Luo, Xueming and Chitra Bhanu Bhattacharya (2009), "The Debate Over Doing Good: Corporate Social Performance, Strategic Marketing Levers, and Firm-Idiosyncratic Risk," *Journal of Marketing*, 73 (6), 198–213.

Luo, Xueming, Christian Homburg, and Jan Wieseke (2010), "Customer Satisfaction, Analyst Stock Recommendations, and Firm Value," *Journal of Marketing Research*, 47 (6), 1041–58.

Madison, Nicolas and Eduardo Schiehll (2021), "The Effect of Financial Materiality on ESG Performance Assessment," *Sustainability*, 13 (7), 3652.

Malshe, Ashwin and Manoj K. Agarwal (2015), "From Finance to Marketing: The Impact of Financial Leverage on Customer Satisfaction," *Journal of Marketing*, 79 (5), 21–38.

Malshe, Ashwin, Anatoli Colicev, and Vikas Mittal (2020), "How Main Street Drives Wall Street: Customer (Dis)satisfaction, Short Sellers, and Abnormal Returns," *Journal of Marketing Research*, 57 (6), 1055–75.

Malshe, Ashwin, Yi Yin, Anatoli Colicev, Yakov Bart and Koen Pauwels (2023), "How ESG Reduces Risk: The Role of Consumers and Institutional Investors," *Marketing Science Institute Working Paper Series*, Report No. 23-129.

McWilliams, Abagail and Donald Siegel (1997), "The Role of Money Managers in Assessing Corporate Social Responsibility Research," *Journal of Investing*, 6 (4), 98–107.

Mishra, Saurabh and Sachin B. Modi (2016), "Corporate Social Responsibility and Shareholder Wealth: The Role of Marketing Capability," *Journal of Marketing*, 80 (1), 26–46.

Mittal, Vikas, William T. Ross Jr., and Patrick M. Baldasare (1998), "The Asymmetric Impact of Negative and Positive Attribute-Level Performance on Overall Satisfaction and Repurchase Intentions," *Journal of Marketing*, 62 (1), 33–47.

Morningstar (2021), “ESG Investing Comes of Age,” (accessed May 30, 2023), https://www.morningstar.com/features/esg-investing-history.

Mukherjee, Mukut (2020), “ESG-BERT: NLP Meets Sustainable Investing,” (accessed June 22, 2023), https://towardsdatascience.com/nlp-meets-sustainable-investing-d0542b3c264b.

Nickerson, Dionne, Michael Lowe, Adithya Pattabhiramaiah, and Alina Sorescu (2022), “The Impact of Corporate Social Responsibility on Brand Sales: An Accountability Perspective,” *Journal of Marketing*, 86 (2), 5–28.

Nguyen, Lananh and Nupur Anand (2023), “Bank of America CEO Says 'We are Capitalists' as Anti-ESG Critics Gain Steam,” (accessed August 14, 2023), https://www.reuters.com/markets/us/bank-america-ceo-says-we-are-capitalists-anti-esg-critics-gain-steam-2023-03-07/

Ocasio, William and John Joseph (2005), “An Attention-Based Theory of Strategy Formulation: Linking Micro- and Macroperspectives in Strategy Processes,” in *Strategy Process, Emerald Group Publishing Limited*, Vol. 22, G. Szulanski, J. Porac, and Y. Doz, eds. Emerald Group Publishing Limited, 39–61.

Orlitzky, Marc, Frank L. Schmidt, and Sara L. Rynes (2003), “Corporate Social and Financial Performance: A Meta-Analysis,” *Organization Studies*, 24 (3), 403–41.

Pancer, Ethan, Lindsay McShane, and Theodore J. Noseworthy (2017), “Isolated Environmental Cues and Product Efficacy Penalties: The Color Green and Eco-labels,” *Journal of Business Ethics*, 143 (1), 159–77.

Parker, David and Colin Kirkpatrick (2012), “Measuring Regulatory Performance,” *The Economic Impact of Regulatory Policy: A Literature Review of Quantitative Evidence*. OECD; 2012.

Pástor, Ľuboš, Robert F. Stambaugh, and Lucian A. Taylor (2021), “Sustainable Investing in Equilibrium,” *Journal of Financial Economics,* 142 (2), 550–71.

Pástor, Ľuboš, Robert F. Stambaugh, and Lucian A. Taylor (2022), “Dissecting Green Returns,” *Journal of Financial Economics*, 146 (2), 403–24.

Peterdy, Kyle (2023), “ESG (Environmental, Social, & Governance),” (accessed May 30, 2023), https://corporatefinanceinstitute.com/resources/esg/esg-environmental-social-governance/.

Price, S. McKay, James S. Doran, David R. Peterson, and Barbara A. Bliss (2012), “Earnings Conference Calls and Stock Returns: The Incremental Informativeness of Textual Tone,” *Journal of Banking & Finance*, 36 (4), 992–1011.

PwC (2021), “ Companies Failing to act on ESG Issues Risk Losing Investors,” (accessed June 5, 2023), https://www.pwc.com/lt/en/about/press-room/pwc-global-investor-esg-survey.html.

Reali, Peter, Jennifer Grzech, and Anthony Garcia (2021), "ESG: Investors Increasingly Seek Accountability and Outcomes," (accessed June 22, 2023), https://corpgov.law.harvard.edu/2021/04/25/esg-investors-increasingly-seek-accountability-and-outcomes/.

Riedl, Arno and Paul Smeets (2017), "Why Do Investors Hold Socially Responsible Mutual Funds?" *Journal of Finance*, 72 (6), 2505–50.

Rosenbaum, Eric (2022), "There's an ESG Backlash Inside the Executive Ranks at Top Corporations," CNBC (September 29), https://www.cnbc.com/2022/09/29/the-esg-backlash-inside-the-executive-ranks-at-top-corporations.html.

Rouziès, Dominique, Anne T. Coughlan, Erin Anderson, and Dawn Iacobucci (2009), "Determinants of Pay Levels and Structures in Sales Organizations," *Journal of Marketing*, 73 (6), 92–104.

Rozin, Paul and Edward B. Royzman (2001), "Negativity Bias, Negativity Dominance, and Contagion," *Personality and Social Psychology Review*, 5 (4), 296–320.

Saboo, Alok R. and Rajdeep Grewal (2013), "Stock Market Reactions to Customer and Competitor Orientations: The Case of Initial Public Offerings," *Marketing Science*, 32 (1), 70–88.

Sacconi, Lorenzo and Giacomo Degli Antoni (2010), Social Capital, Corporate Social Responsibility, Economic Behaviour and Performance, Springer.

Sanders, Wm Gerard and Steven Boivie (2004), "Sorting Things Out: Valuation of New Firms in Uncertain Markets," *Strategic Management Journal*, 25 (2), 167–86.

Schiehll, Eduardo and Sam Kolahgar (2021), "Financial Materiality in the Informativeness of Sustainability Reporting," *Business Strategy and the Environment*, 30 (2), 840–55.

Schramade, Willem (2016), "Integrating ESG Into Valuation Models and Investment Decisions: the Value-Driver Adjustment Approach," *Journal of Sustainable Finance & Investment*, 6 (2), 95–111.

Schroeder, Pete, Lananh Nguyen, and Saeed Azhar (2022), "Republicans Warn Bank CEOs to Steer Clear of Social, Cultural Issues," (august 14) https://www.reuters.com/world/us/senior-republican-chastises-banks-social-agenda-that-harms-america-2022-09-22/

Serafeim, George and Aaron S. Yoon (2022), "Understanding the Business Relevance of ESG factors," *Journal of Financial Reporting*, 7 (2), 207–12.

Servaes, Henri and Ane Tamayo (2013), "The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness," *Management Science*, 59 (5), 1045–61.

Shane, Philip B. and Barry H. Spicer (1983), "Market Response to Environmental Information Produced Outside the Firm," *Accounting Review*, 58 (3), 521–38.

Spence, A. Michael (1973), "Time and Communication in Economic and Social Interaction," *Quarterly Journal of Economics*, 87 (4), 651–60.

Spence, Michael (2002), "Signaling in Retrospect and the Informational Structure of Markets," *American Economic Review*, 92 (3), 434–59.

Sridhar, Shrihari, Frank Germann, Charles Kang, and Rajdeep Grewal (2016), "Relating Online, Regional, and National Advertising to Firm Value," *Journal of Marketing*, 80 (4), 39–55.

Stigler, George (1971), "The Theory of Economic Regulation," *Bell Journal of Economics and Management Science*, II, 3–21.

Tayan, Brian, David Larcker, Edward Watts, and Lukasz Pomorski (2022), "ESG Ratings: A Compass without Direction," *The Harvard Law School Forum on Corporate Governance*.

Vadakkepatt, Gautham G., Sandeep Arora, Kelly D. Martin, and Neeru Paharia (2022), "Shedding Light on the Dark Side of Firm Lobbying: A Customer Perspective," *Journal of Marketing*, 86 (3), 79–97.

Vaish, Amrisha, Tobias Grossmann, and Amanda Woodward (2008), "Not All Emotions Are Created Equal: The Negativity Bias In Social-Emotional Development," *Psychological Bulletin*, 134 (3), 383–403.

Wang, Mingzhu and Yugang Chen (2017), "Does voluntary corporate social performance attract institutional investment? Evidence from China," *Corporate Governance: An International Review*, 25 (5), 338–57.

Woodroof, Parker J., George D. Deitz, Katharine M. Howie, and Robert D. Evans (2019), "The Effect of Cause-Related Marketing on Firm Value: A Look at Fortune's Most Admired All-Stars," *Journal of the Academy of Marketing Science*, 47 (5), 899–918.

Yadav, Manjit S., Jaideep C. Prabhu, and Rajesh K. Chandy (2007), "Managing the Future: CEO Attention and Innovation Outcomes," *Journal of Marketing*, 71 (4), 84–101.

Web Appendix

When Non-Materiality is Material: Impact of ESG Emphasis on Firm Value

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Web Appendix A

Procedures to extract material and non-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, A2a, and A2b), we determined the materiality status of each of the 26 identified ESG issues, categorizing them as either material or non-material.

We outline here 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 extract the 26 ESG metrics from the text of earnings call transcripts, we use a fine-tuned pre-trained language model called ESG BERT (Mukherjee 2020). This model is specifically trained to analyze and understand text data related to ESG topics. It uses a pre-trained BERT (Devlin et al. 2019) model that was further pre-trained on the Sustainable Investing text corpus, resulting in a domain-specific model (Mukherjee 2020). ESG-BERT demonstrated 100% and 98% accuracy for Next Sentence Prediction and Masked Language Modelling tasks, respectively (see Devlin et al. 2019 for original BERT tasks). Fine-tuning ESG-BERT for text classification yielded an F-1 score of 0.90, suggesting that the model demonstrated high accuracy and precision in identifying 26 ESG metrics. For comparison, the general BERT (BERT-base) model scored 0.79 after fine-tuning, and the standard machine learning-based models scored 0.67 (Mukherjee 2020), confirming the superior performance of this model in classifying ESG text. Using ESG BERT, we extracted data on 26 different metrics related to ESG (see Table A2). Next, we leverage the SASB industry mapping to classify these 26 ESG factors into non-material or material.

Step 3: **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.

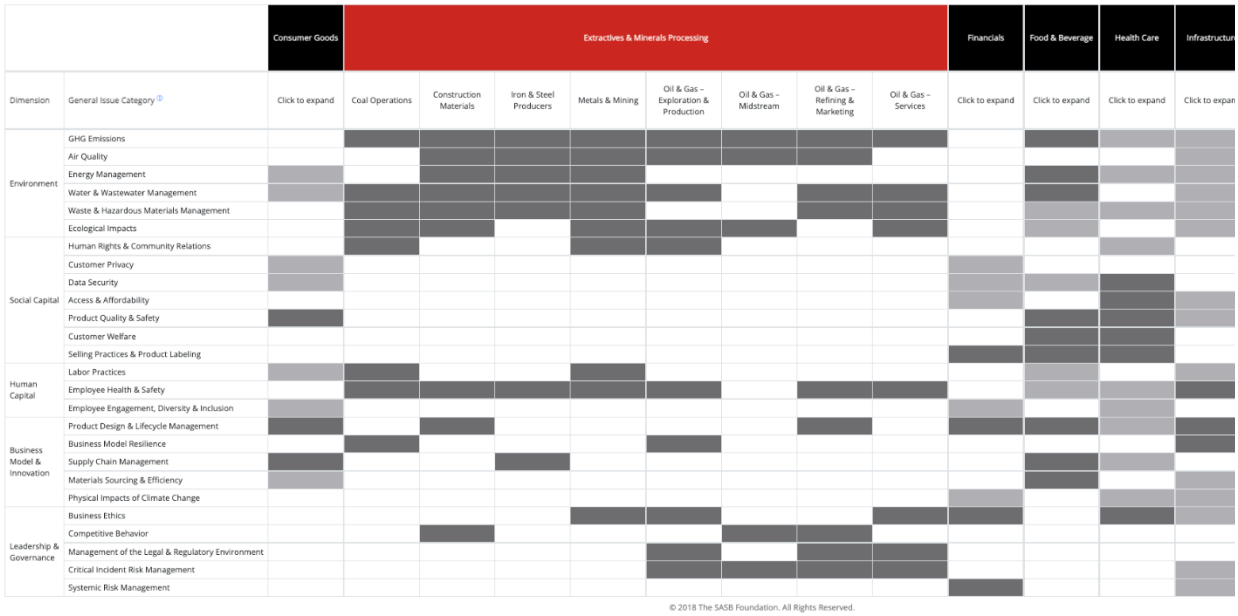
***Step 4*: Non-Materiality/ Materiality Assessment**

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 5*: ESG Non-Material And Material Emphasis**

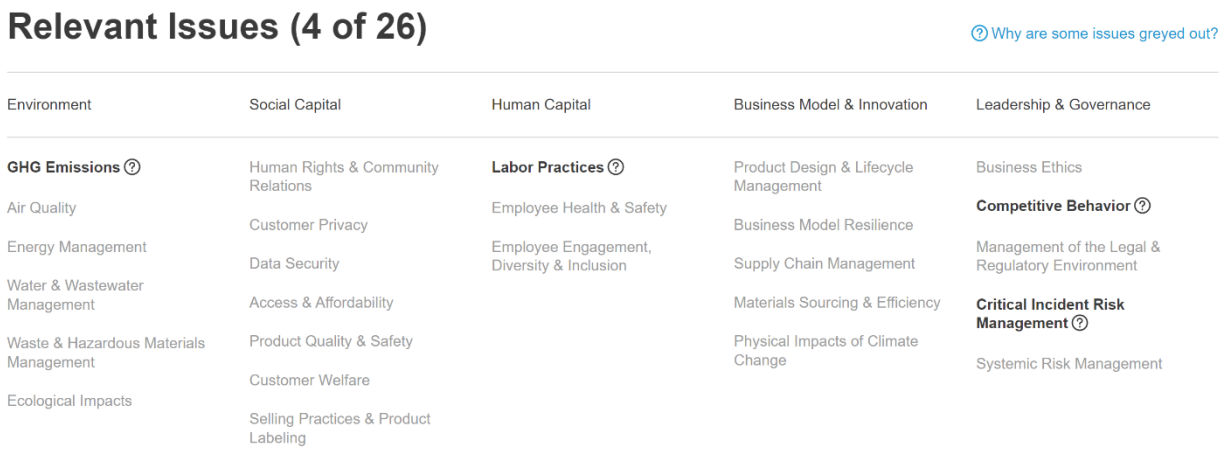
We relied on the total number of sentences extracted from all transcripts to determine the relative focus and attention given to non-material (material) ESG issues for a specific company in a given year. To operationalize the extent to which the company focused on non-material (material) ESG issues in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



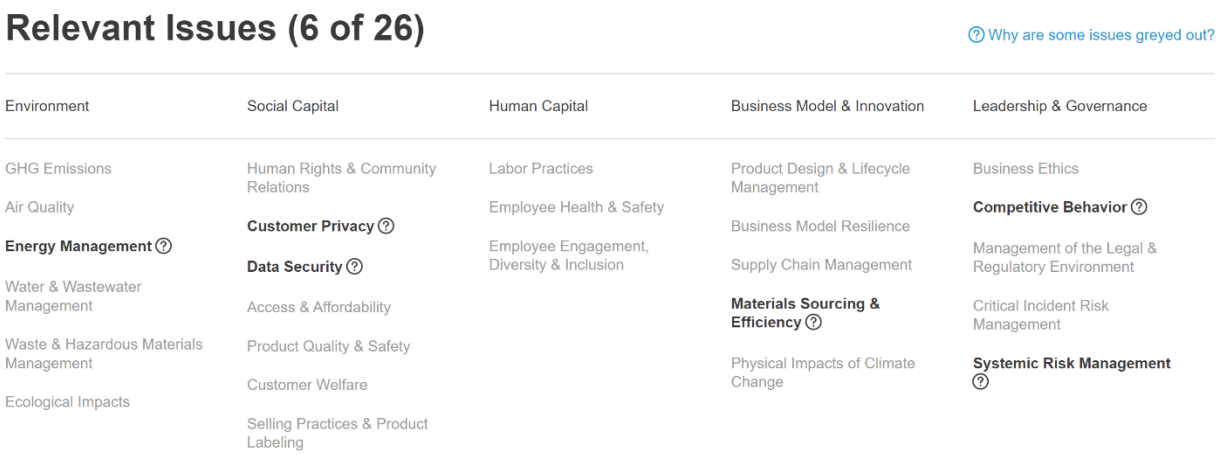
Source: Sustainability Accounting Standards Board (http://www.sasb.org/).
Dark (light) grey color means that the issue is material for more (less) than 50 percent of the industries within the sector. White means that the issue is not material for any industry within the sector. To see materiality maps 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 A1: 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

Table A2: 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, Philipp, Marc Berninger, and Florian Kiesel (2020), "Environmental, Social and Governance Reporting in Annual Reports: A Textual Analysis," *Financial Markets, Institutions & Instruments*, 29 (3), 93–118.

Mukherjee (2020), "ESG-BERT: NLP Meets Sustainable Investing," https://towardsdatascience.com/nlp-meets-sustainable-investing-d0542b3c264b (accessed June 22, 2023)

Web Appendix B. Robustness Checks

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

Controlling for advertising

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 B1 demonstrates the robustness of our results to adding this control variable.

Table B1. Robustness Checks: With Advertising Intensity

	Firm Value	
Nonmaterial ESG emphasis	-.498***	(.111)
Material ESG emphasis	.158**	(.069)
Nonmaterial ESG emphasis × time elapsed	-.003**	(.001)
Material ESG emphasis × time elapsed	-.000	(.001)
Nonmaterial ESG emphasis × regulation	-.047***	(.014)
Material ESG emphasis × regulation	.034***	(.010)
Time elapsed	-.014*	(.007)
Firm leverage	-.293***	(.023)
Cash flow	.109***	(.037)
Profit margin	.071**	(.034)
Firm size	-.101***	(.013)
R&D intensity	-.001**	(.000)
Advertising intensity	.001	(.005)
Industry concentration	.093*	(.051)
Market share	-.028	(.055)
Ctr. function correction for material ESG emphasis	-.161**	(.069)
Ctr. function correction for nonmaterial ESG emphasis	.512***	(.112)
Constant	.509	(.523)
No. of obs.	32,434	
R^2	.114	
Year fixed effects	Yes	

Industry fixed effects	Yes
Firm fixed effects	Yes

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. The coefficient of regulation is eliminated due to the fixed effects model. Given a substantial decrease of approximately 18% in the number of observations from 39,673 to 32,434, we do not include advertising intensity in our main model.
*$p < .10$, **$p < .05$, ***$p < .01$.

Alternative measure of Tobin's q

Bendle and Butt (2018) argued that intangible assets should be removed from the total assets when calculating Tobin's q. Accordingly, we performed our analysis using their suggested alternative measure of Tobin's q. Our results are robust as presented in Table B2.

Table B2. Robustness Checks: With Alternative Measure Of Firm Value

	Firm Value	
Nonmaterial ESG emphasis	-.859***	(.136)
Material ESG emphasis	.320***	(.071)
Nonmaterial ESG emphasis × time elapsed	-.006***	(.001)
Material ESG emphasis × time elapsed	-.00001	(.001)
Nonmaterial ESG emphasis × regulation	-.078***	(.019)
Material ESG emphasis × regulation	.053***	(.014)
Time elapsed	-.028***	(.008)
Firm leverage	-.489***	(.023)
Cash flow	.042*	(.024)
Profit margin	.065***	(.021)
Firm size	-.098***	(.014)
R&D intensity	-.000***	(.000)
Industry concentration	.237***	(.045)
Market share	-.142***	(.049)
Ctr. function correction for material ESG emphasis	-.328***	(.071)
Ctr. function correction for nonmaterial ESG emphasis	.895***	(.137)
Constant	-.481	(.607)
No. of obs.	39,673	
R^2	.100	
Year fixed effects	Yes	
Industry fixed effects	Yes	
Firm fixed effects	Yes	

Notes: Robust standard errors are in parentheses. Control functions are estimated using ESG emphasis of peer firms as instruments. The coefficient of regulation is eliminated due to the fixed effects model.
*$p < .10$, **$p < .05$, ***$p < .01$.

References

Bendle, Neil Thomas and Moeen Naseer Butt (2018), "The Misuse of Accounting-Based Approximations of Tobin's q in a World of Market-Based Assets," *Marketing Science*, 37 (3), 484–504.

Malshe, Ashwin and Manoj K. Agarwal (2015), "From Finance to Marketing: The Impact of Financial Leverage on Customer Satisfaction," *Journal of Marketing*, 79 (5), 21–38.

Web Appendix C. Difference between ESG and ESR

ESG and CSR

Although ESG and CSR are related constructs and research tends to treat them as interchangeable (e.g., Gillan, Koch, and Starks 2021), they have a few crucial differences. ESG transcends traditional financial metrics to assess a company's sustainability and ethical practices. It evaluates a firm's performance and impact in three key areas: environmental, social, and governance. The environmental component emphasizes minimizing an ecological footprint, reducing resource consumption, and combating climate change. Social factors encompass relationships with employees, customers, communities, and other stakeholders, covering diversity, labor practices, and human rights. Governance factors probe internal structures, processes, policies, and decision-making transparency, including board composition and executive compensation. ESG factors are gaining recognition as critical determinants of a company's risk profile, reputation, and enduring financial performance. Investors, shareholders, and other stakeholders are progressively incorporating ESG considerations while making investment decisions and assessing a company's overall value and credibility.

Conversely, CSR encompasses companies' voluntary initiatives and actions that go beyond legal obligations in an effort to make positive contributions to society. CSR often involves activities such as philanthropy, community engagement, and environmental stewardship. For example, a company may donate a portion of its profits to charitable organizations, sponsor community development projects, or implement eco-friendly practices in its operations. While CSR is an integral component of ESG, it tends to focus more on external social and environmental initiatives rather than integrating governance considerations.

As such, ESG provides a broader and more comprehensive framework for evaluating a company's sustainability and responsible business practices. It goes beyond social and environmental impacts, emphasizing the significance of robust governance structures and ethical decision-making processes. ESG takes a holistic approach to assessing a company's overall performance, ensuring that it operates in a sustainable and socially responsible manner.

References

Gillan, Stuart L., Andrew Koch, and Laura T. Starks (2021), "Firms and Social Responsibility: A Review of ESG and CSR Research in Corporate Finance," *Journal of Corporate Finance*, 66, 101889.

Web Appendix D. Growth of ESG and SASB

Figure1. Google trend for the term "ESG"

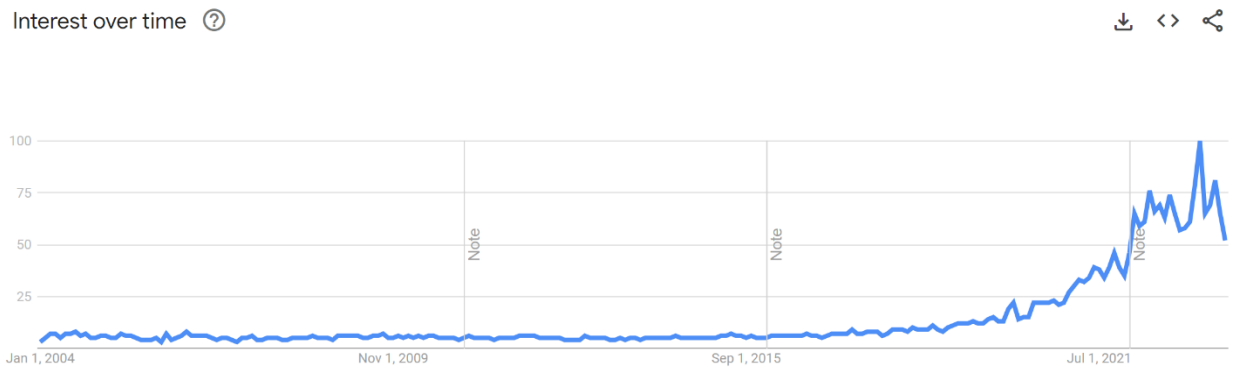


Figure2. Google trend for the term "SASB"