

# Corporate ESG Disclosures and Regulatory Mandates: The Role of Investors' Perceptions of Greenwashing

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**ABSTRACT:** Given historically lax ESG regulation, management has substantial discretion over whether/how to disclose ESG goals or commitments. As stakeholders question the reliability of corporate ESG disclosures, regulators have proposed and begun to implement ESG reporting mandates. Using an experiment, we examine how investors' perceptions of greenwashing change when an ESG outcome is disclosed after different types of ESG goals were issued in both voluntary and mandatory regulatory reporting regimes. Although challenging quantitative ESG goals are encouraged to incent more ESG activity, we first document that investors' perceptions of greenwashing increase when a company misses a quantitative goal, but they decrease when a company beats a quantitative goal or issues a qualitative goal, even when corporate ESG outcomes are identical in all cases. Mandates further exacerbate changes in investors' greenwashing perceptions by magnifying the positive and negative effects of quantitative ESG goals, which in turn, drives changes in investment willingness.

**Data Availability:** Data are available from the authors upon request.

**Keywords:** investor judgment; greenwashing; attribution theory; ESG regulation; ESG goals.

## I. INTRODUCTION

Most large, public companies now disclose environmental, social, and governance (ESG) goals (KPMG 2020; Gez, Anognosti, and Pullins 2022).<sup>1</sup> Management has significant discretion over how to disclose ESG goals, a key input for assessing ESG performance. Some ESG goals are explicit quantitative benchmarks, whereas others are qualitative intentions to engage in specific ESG activities. Recently, ESG goals and commitments have been widely criticized due to a perception of corporate “greenwashing” (United Nations 2022, 2023), whereby stakeholders are concerned that companies use goals to portray a green image yet fail to allocate meaningful effort (Katz 2008; Wong, Lai, Shang, Lu, and Leung 2012; Seele and Gatti 2017). Overall, in this reporting environment where lax regulation affords management significant discretion, stakeholders are demanding more consistency, reliability, and transparency (Bernow, Godsall, Klempler, and Merten 2019; IFC 2012; Impact Management Project 2020; Environmental

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We are grateful for helpful comments from Victor S. Maas (editor), two anonymous reviewers, Dirk Black, Deni Cikurel, Ling Harris, Bright Hong, Kevin Jackson, Scott Jackson, Rachel Lyman, Drew Newman, Mark Peecher, Matt Stern, Todd Thornock, workshop participants at University of Nebraska–Lincoln, Aalto University–Helsinki, and anonymous reviewers for the 2022 Financial Accounting Reporting Section Midyear Meeting and 2022 Hawaii Accounting Research Conference. We are also grateful to The University of Alabama for funding this research.

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Editor's note: Accepted by Senior Editor Victor S. Maas.

*Submitted: December 2023*  
*Accepted: October 2024*  
*Early Access: November 2024*

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<sup>1</sup> The terms “ESG,” “CSR,” and “Sustainability” are defined similarly and are often used interchangeably (Christensen et al. 2021). We use “ESG” for brevity to describe corporate activities related to a firm's impact on the environment and society.

Protection Agency 2021; SEC 2021). As a result, key regulatory bodies (i.e., the SEC, European Union, and IFRS Foundation) have recently proposed mandating disclosure of certain ESG goals and information (SEC 2022; IFRS 2021a). In this paper, holding ESG outcomes constant, and without actually manipulating corporate greenwashing in any way, we examine how the type of ESG goal and the regulatory environment jointly influence investors' perceptions of greenwashing once the outcome is known and, in turn, how this changes their willingness to invest.

With a lack of transparency surrounding ESG disclosures, investors have little diagnostic evidence to evaluate potentially misleading green claims (Seele and Gatti 2017). In this environment, investors are forced to develop *perceptions* of managements' motives for communicating green claims by drawing inferences from managements' observable actions. Attribution Theory suggests that observing a high level of effort spent on a task increases perceptions of the actor's intrinsic motives for engaging in the activity (Weiner 1979, 1985; Parguel, Benoit-Moreau, and Larceneux 2011). Irrespective of the actual effort that a company allocates to ESG, when a company exceeds, or "beats," a quantitative ESG goal, investors' perceptions of corporate effort and intent are likely to be positive, potentially helping to decrease perceptions of corporate greenwashing. Conversely, when a company falls short of, or "misses," a quantitative ESG goal, investors' perceptions of effort and intent are likely to be less favorable, potentially increasing investors' perceptions of greenwashing. When a qualitative goal is initially disclosed, any reasonable, positive movement on the ESG initiative is consistent with positive effort (Locke and Latham 1990), potentially decreasing perceptions of greenwashing. Thus, holding the ESG outcome constant, we predict that investors' greenwashing perceptions will depend on the type of ESG goal management disclosed. Further, as perceptions of greenwashing increase, management's reputation and perceptions of firm value erode (Walker and Wan 2012; Du 2015). Thus, factors that drive investors' perceptions of greenwashing are important because they can have meaningful economic consequences. Taken together, we expect investors to be less (more) willing to invest when they perceive corporate greenwashing to have (decreased) increased.

As governing bodies continue to consider approaches to regulate ESG goal and related performance disclosures (SEC 2021, 2022; IFRS 2021a), we examine how moving from a voluntary to a mandatory ESG reporting regime affects investors' perceptions of greenwashing and investment judgments. Attribution theory indicates that investors are more likely to attribute a voluntary disclosure to management's decision but a mandatory disclosure to the external reporting environment (Gilbert 1998; Jones and Davis 1965; Bhattacharya and Ritter 1983; Koonce and Mercer 2005). This suggests that when a company misses a quantitative ESG goal in a voluntary reporting environment, investors are more likely to attribute the disclosure of relatively negative information to management acting in a forthcoming manner, potentially helping to mitigate negative judgments (smaller increase in greenwashing perceptions), than when the disclosures are mandated. By contrast, when a company beats a quantitative ESG goal in a mandatory reporting environment, investors are more likely to shift some of the attribution for the positive news to the reporting standard and away from management acting in a self-serving manner, potentially increasing positive judgments (larger decrease in greenwashing perceptions) than when the disclosures are voluntary (Reimsbach and Hahn 2015). This suggests that a mandatory reporting regime, compared with a voluntary one, will work to magnify investors' positive judgments in response to a company beating a quantitative ESG goal and investors' negative judgments in response to a company missing a quantitative ESG goal, holding the reported ESG outcomes constant. Thus, we predict that the regulatory requirement will interact with the type of goal disclosure to influence any changes in investors' perceptions of greenwashing and, in turn, their willingness to invest.

To test our predictions, we conduct a between-participants experiment in which we manipulate the initial ESG goal disclosure as a quantitative goal operationalized so that the company either misses or beats it, given an identical ESG outcome. To speak to the many types of ESG goals disclosed in practice, we also consider the influence of a qualitative goal condition. For a baseline comparison, we also add a no ESG goal condition. In all conditions, the same ESG outcome is reported, but we manipulate the regulatory reporting requirement for ESG outcomes as either voluntary or mandatory. We provide participants with information about the ESG regulatory reporting requirement and summary financial information, followed by a company press release where we manipulate the company's ESG goal type. After receiving the ESG press release, we capture participants' initial perceptions of greenwashing and investment willingness. Next, participants are presented with the company's ESG performance announcement that reports identical ESG outcomes in all conditions. We then measure perceptions of greenwashing and investment willingness in response to the ESG outcome disclosure and calculate the change in these variables for use in our main analyses. We do not manipulate any firm characteristics that explicitly indicate *actual* corporate greenwashing, rather we measure investor *perceptions* of greenwashing based on characteristics of managements' ESG disclosures for identical outcomes.<sup>2</sup> The experiment concludes with questions designed to capture manipulation checks, process measures, and demographic information.

<sup>2</sup> Although comparisons of ESG outcomes to goals do not provide specific information indicative of *actual* corporate greenwashing, investors could infer intent when assessing whether they feel that the effort that management put into the ESG initiative was sufficient.

As expected, results show that, in response to the same ESG outcome, participants' perceptions of greenwashing increase when the company misses a quantitative ESG goal and decrease when the company beats a quantitative ESG goal or issues a qualitative ESG goal. Importantly, in light of forthcoming ESG disclosure regulations, we capitalize on the advantages of an experiment that allow us to test potential consequences of different ESG regulatory environments. Results support our prediction that the effect of management's ESG goals on investors' perceptions of greenwashing are moderated by the regulatory environment. That is, mandating ESG outcome disclosures magnifies positive greenwashing attributions when a firm beats a quantitative ESG goal (i.e., greater decrease in perceived greenwashing) and exacerbates negative greenwashing attributions when a firm misses a quantitative ESG goal (i.e., greater increase in perceived greenwashing). Finally, we provide mediation results that investors' perceptions of greenwashing have meaningful economic consequences even when no information about actual greenwashing is provided. Specifically, we find that greenwashing perceptions are integral to explaining how investors' reactions to ESG disclosures influence investment willingness. Consistent with attribution theory, we find that the type of ESG goal management discloses interacts with the ESG regulatory environment. In response to identical ESG outcomes, investment willingness increases more when a firm beats a quantitative ESG goal in a mandatory reporting environment than in a voluntary reporting environment. Yet, investment willingness decreases more when a firm misses a quantitative ESG goal in a mandatory reporting environment than in a voluntary reporting environment. Further, we find that the change in perceptions of greenwashing mediates investors' responses to ESG goals under voluntary versus mandatory reporting regimes.

This study makes a key contribution to the ESG literature regarding the incentive environment in which management's ESG disclosure decisions could indirectly affect the extent of their ESG behavior. Considering that a key objective for companies, regulators, and society more broadly, is to facilitate an overall increase in ESG activity, ambitious goals that stretch and incentivize management would seem to be an important antecedent (Locke and Latham 1990, 2002, 2013). However, perceptions of greenwashing alter how investors respond to such ambitious goals if they are missed, which is more likely to occur when goals are ambitious. Accordingly, our findings highlight a key tension for managers deciding whether and how to communicate ESG goals to investors while also being mindful of the overall benefits of increased ESG output. That is, regarding investment willingness, managers may be better off disclosing more achievable, less ambitious goals than goals that are a stretch or relatively more ambitious. Further, this potentially counterproductive incentive to disclose modest ESG goals appears to be exacerbated by mandatory reporting, such that missing (beating) a goal under a mandatory reporting environment further reduces (increases) investment willingness. These findings suggest a complicated setting, highlighting the need to develop disclosure regulations that both improve information quality and promote more ESG behavior.

Our findings should be helpful to firms, regulators, and researchers tasked with improving the conduct and transparency of ESG activity and disclosures. Firms need to consider the complex effect of ESG goals regarding incentivizing behavior in the presence of the greenwashing perceptions of investors. Given that investors' greenwashing perceptions, in response to ESG disclosures, drive their willingness to invest, future research should consider how these perceptions can be moderated when developing goal reporting strategies. Finally, regulators attempting to reduce *actual* greenwashing and improve the reliability of ESG information need to understand how ESG disclosure mandates may alter investors' *perceptions* of greenwashing, which should be considered holistically with other aspects of the ESG landscape to avoid unintentional restraints to ESG activity. Future research may use the greenwashing measure developed in this study to help accomplish this goal.

## II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### ESG Goals and Disclosure Practices

Investments focused on corporate social responsibility are substantial, with approximately \$17 trillion invested sustainably in the United States alone (USSIF 2021). Prior research suggests numerous capital market benefits for companies that choose to disclose ESG information. For example, ESG reporters tend to have better financial reporting credibility (Chakravarthy, De Haan, and Rajgopal 2014; Cui, Jo, and Na 2018; Kim, Park, and Wier 2012), lower cost of capital, and stronger ability to attract institutional investors and analyst coverage (Dhaliwal, Oliver, Tsang, and Yong 2011; Plumlee, Brown, Hayes, and Marshall 2015). Given the economic significance and corporate benefits, ESG reporting has become a standard practice for public companies, with 96 percent of the world's largest companies issuing ESG reports on a regular basis (KPMG 2020).

Amidst widespread concerns regarding the implications of climate change on society, forward-looking goals or targets have become a key input for stakeholders to assess ESG performance within the ESG disclosure setting. Although the vast majority of large public companies now include ESG goal disclosures, there is considerable variation in the

types of ESG goals that companies disclose (Gez et al. 2022). Although some ESG goal disclosures include specific *quantitative* goal metrics (e.g., 5,000 volunteer hours),<sup>3</sup> others include more ambiguous *qualitative* goals in the form of general directional statements (e.g., reduce greenhouse gas emissions),<sup>4</sup> and a single company often issues multiple goals in different forms. Although management has significant discretion about whether and how to disclose ESG goals, doing so sets an expectation that the company will engage in actions to achieve its stated objective; thus, relative ESG performance is tightly linked to investors' perceptions of managements' effort and intent for engaging in ESG activities.

### Actual Greenwashing and Perceived Greenwashing

Although ESG goals are common, they have become a key source of contention within the ESG disclosure setting due, in part, to their use as a tool to signal a false green image (i.e., engaging in actual greenwashing) (United Nations 2022). "Greenwashing" has been defined in a variety of ways (Seele and Gatti 2017; Carlson, Grove, and Kangun 1993; Schaltegger and Burritt 2010), but definitions converge around the idea that corporate greenwashing occurs when "an organization intentionally communicates false or misleading green claims" (Seele and Gatti 2017, 245; Hales 2021). Recently, the chair of the IASB indicated that the practice of corporate "greenwashing is rampant" (Hoogervorst 2019), and two of the top five most commonly cited greenwashing practices relate to overstating and failing to meet ESG-related commitments (Cerulli Associates 2023). For example, even though over 75 percent of the world's largest companies now disclose "net zero" or carbon reduction goals (KPMG 2020), fewer than 5 percent have prepared strategies to actually achieve their disclosed goals, increasing concerns of greenwashing practices (Net Zero Tracker 2023). In fact, greenwashing has become so widespread that hedge funds have developed trading strategies to detect and short companies suspected of engaging in greenwashing (Ridley and Jessop 2019).

Prior research finds evidence consistent with the practice of corporate greenwashing, which has been shown to harm corporate legitimacy, firm reputations, and firm value (Cho, Roberts, and Patten 2010; Walker and Wan 2012; Du 2015). One common form of greenwashing is a pattern where public companies announce greenhouse gas reduction goals and then engage in practices that cause greenhouse gas emissions to increase (CDP 2015). By disclosing planned ESG initiatives or goals, companies could potentially build a positive image with little regulatory consequence if they later fail to pursue the activities and/or fail to disclose the associated ESG performance. For example, more than one-fifth of the world's largest 2,000 listed companies have announced goals to be "net zero" before 2050 (e.g., Amazon, Microsoft, P&G, Visa, and Jet Blue) (Sheehan, Johnson, and Lubbock 2021; The Climate Pledge 2021), but they are not currently required to provide any information to support that goal (SEC 2021). In response to concerns "around the use of net zero pledges that make greenwashing possible," the United Nations recently established a task force and reached an agreement to mitigate corporations' use of goals or commitments for greenwashing purposes (United Nations 2022, 2023).

Due to the rise of actual corporate greenwashing instances, investors have now become particularly skeptical of ESG disclosures (EY 2022). In fact, a recent survey shows that when a CEO makes a public commitment to "net zero," only 9 percent of people believe that the company is serious about climate change (Sheehan et al. 2021). Given variability in the current ESG reporting environment, investor demand for reliable and quantifiable ESG metrics that provide key sustainability information has grown rapidly in recent years (Morgan Stanley 2019; USSIF 2021).

It is against this backdrop that investors are in the unenviable position to distinguish between substantive and greenwashed ESG disclosures (Delmas and Burbano 2011). That is, in a variety of inconsistent ESG disclosure settings, investors must infer management's intentions and can only develop a *perception* of the extent of greenwashing relative to actual socially responsible behavior. Seele and Gatti (2017) note this important distinction between *actual* greenwashing in which a company deliberately misleads outsiders through ESG communications and *perceived* greenwashing in which greenwashing occurs in "the eye of the beholder" through an external accusation. They note that it is difficult to determine whether actual greenwashing occurs because both high- and low-ESG-performing firms have incentives to signal a (potentially false) green image. "As a consequence, stakeholders cannot distinguish between a substantive and

<sup>3</sup> Quantitative ESG goals are common. For example, Wells Fargo's 2018 ESG report includes a list of ESG goals to be completed by 2020 that includes quantitative goals like reducing energy consumption by 40 percent. Additionally, they provide performance disclosures for some of the reported ESG goals as well as performance disclosures for ESG issues in which they did not disclose a goal (Wells Fargo 2018). Walmart (2024) discloses a goal for zero waste in key markets by 2025 and 50 percent renewable energy use by 2025. Procter & Gamble (2024) aims for 100 percent recyclable packaging by 2030 and 50 percent emissions reduction by 2030. Nestlé (2024) discloses a goal for zero net emissions by 2050 and 100 percent renewable energy use by 2025.

<sup>4</sup> Qualitative goals are also common. For example, Wells Fargo's 2018 ESG report includes qualitative goals like enhancing human rights risk management. Patagonia (2024) emphasizes fair labor practices, environmental activism, and sustainability culture. Ben & Jerry's (2024) prioritizes fair trade, climate justice, and social equity. Danone (2024) commits to regenerative agriculture, community growth, and transparent governance. IKEA (2024) promotes a circular economy, responsible sourcing, and fair labor practices.



merely symbolic value on the basis of a company's engagement in green communication or green advertisement or green strategies" (Seele and Gatti 2017, 243). Given the difficult nature of determining whether actual greenwashing occurs using ESG communications, investors likely rely on available signals to develop perceptions of greenwashing. This environment has led two-thirds of Americans to believe that companies overstate or exaggerate environmental ESG claims (Katz 2008), such that perceptions of greenwashing likely have significant economic implications, irrespective of the extent to which actual greenwashing occurs. Given the potential economic implications of pervasive greenwashing *perceptions* among investors, we draw on prior research to develop a measure of perceived greenwashing for environmental, social, and governance factors within this context (see Section III for details).

### Investor Greenwashing Attributions

Given the lack of transparency surrounding ESG disclosures, investors are often left with little diagnostic evidence to evaluate ESG activities (Seele and Gatti 2017). Investors can develop perceptions of greenwashing activity as they consider initial ESG goals and the ensuing effort that led to observable ESG outcomes. *Attribution Theory* suggests that individuals tend to attribute observed outcomes to internal factors within others' control rather than external factors outside of others' control (Weiner 1985; Graham 1991). The perceived amount of effort expended on a task has been shown to increase attributions to intrinsic motives because effort requires willingness (Weiner 1979). Thus, observing an outcome, and inferring effort, likely changes perceptions of greenwashing. Specifically, to the extent that investors rely on disclosed ESG goals as a good-faith anchor to assess ESG performance, beating an ESG goal could signal more effort and stronger intent by management, decreasing perceived greenwashing, whereas missing an ESG goal could signal less effort and weaker intent, increasing perceptions of greenwashing.<sup>5</sup>

Although *quantitative* ESG goals provide explicit benchmarks that investors can use to evaluate ESG performance outcomes, many companies provide *qualitative* ESG goal disclosures indicating intent to engage in ESG activities without a quantitative benchmark, where any reasonably positive progress is generally consistent with the goal (Locke and Latham 1990, 2002; Christensen, Hail, and Leuz 2019).<sup>6</sup> Positive progress toward a qualitative goal signals positive effort and intent and similar to the effects of beating a quantitative ESG goal could decrease perceived greenwashing.<sup>7</sup>

Taken together, we expect that the announcement of identical ESG outcomes will decrease perceived greenwashing when a firm beats a quantitative goal or issues a qualitative goal and increase perceived greenwashing when a firm misses a quantitative goal. We formally state our prediction as H1 below.

**H1:** Investors' perceptions of greenwashing will increase in response to an ESG outcome when a company misses a quantitative ESG goal, but investors' perceptions of greenwashing will decrease in response to the same ESG outcome when it beats a quantitative ESG goal or when it sets a qualitative ESG goal.

### Regulation of ESG Disclosures

Discussions to regulate ESG reporting in the United States are ongoing, with regulators recently requesting input from constituents on ways to increase the consistency, comparability, and reliability of disclosed climate-related ESG information (SEC 2021).<sup>8</sup> Further, many non-U.S. jurisdictions (e.g., Sweden, Norway, France, and Australia) already have some form of a mandatory ESG disclosure requirement. The European Parliament recently implemented a directive that requires companies in all member-states of the EU to disclose certain ESG performance metrics (EU 2019/2088). Many investors and regulators believe that an ESG reporting mandate could be an effective approach to protect shareholders by mitigating actual corporate greenwashing (Wu, Zhang, and Xie 2020; Christensen et al. 2021; T. Rowe Price 2021). For example, research shows that socially *irresponsible* companies use voluntary ESG disclosures to influence public perceptions by marketing socially responsible programs and then disclosing trivial and vague performance metrics

<sup>5</sup> For example, both Nestlé and P&G made goals for "zero-deforestation" by 2020. Although both companies made great strides toward zero-deforestation (nearly 90 percent), an announcement that they would miss their ambitious quantitative goal resulted in accusations of greenwashing and negative backlash from the media and various advocacy groups (Ridley and Jessop 2019; *The Business Times* 2019).

<sup>6</sup> Qualitative ESG disclosures are ubiquitous in ESG reports and can be particularly useful due to the inherent difficulty of quantifying certain ESG metrics (SEC 2021). However, they may also be used to intentionally provide less useful information to investors (Skarmees, Leonidou, and Saridakis 2014).

<sup>7</sup> On the other hand, due to a lack of ESG goal disclosure regulation, investors may be skeptical of companies that issue qualitative goals or disclose meeting or beating quantitative ESG goals. Research shows that individuals are more skeptical of subjective, qualitative information because it is inherently less precise and verifiable (Nelson 1974; Ford, Smith, and Swasy 1990). A recent analysis indicates that about two-thirds of companies that suggest they are on track to meet quantitative emission-reduction goals for 2030 had set unambitious targets (*The New York Times* 2021).

<sup>8</sup> After this call for input, about 75 percent of constituents' comment letters received by the SEC expressed support for mandating climate-related ESG disclosures. The SEC formally proposed a rule change in March 2022 that includes a requirement to disclose the performance for any publicly set climate-related goals (Gensler 2021; KPMG 2021; Deloitte & Touche 2021; Apple 2021; Tyson Foods 2021; SEC 2022).

(O'Donovan 2002). When the disclosure of more precise ESG outcome metrics is mandatory, the mandate serves as a commitment device (Mahoney 1995) that holds companies responsible for their ESG performance, potentially mitigating the ability of companies to engage in actual corporate greenwashing (Wu et al. 2020).

However, a requirement to disclose ESG outcome information likely changes investors' attributions of ESG information to management and their perceptions of greenwashing. Correspondent inference theory (a subset of attribution theory) suggests that voluntary, relative to mandatory, actions are more attributable to the individual than to the external situation and can provide additional information beyond what is included in the disclosure (Jones and Davis 1965; Bhattacharya and Ritter 1983; Gilbert 1998; Koonce and Mercer 2005). As such, managements' voluntary decision to disclose ESG performance information increases internal attributions (i.e., to management), whereas a mandatory requirement to disclose ESG performance information increases external attributions (i.e., to the reporting requirement).

These attributed intentions are important given that the construct of perceived greenwashing is itself a perception of management intentions. For example, when management reports positive ESG outcomes in a voluntary reporting environment, the disclosure is more likely to appear self-serving to management. That is, their intent is attributed internally to support the positive message of "being green." Such an attribution is less likely when operating in a mandatory disclosure regime where management is, in a sense, "forced" to report the good news, resulting in investors attributing the disclosure externally (rather than internally) such that management is viewed as less likely to engage in greenwashing. On the other hand, when management reports relatively negative ESG outcomes in a voluntary reporting environment, investors attribute their intentions internally such that they are viewed as being forthright and transparent about their ESG efforts, and investors perceive management to be less likely to engage in greenwashing than when the same disclosure is mandatory.<sup>9</sup> When management is "forced" to report bad news in a mandatory reporting regime, this internal attribution of intention is again removed, causing investors to be relatively more likely to presume that management is engaged in greenwashing.

This suggests that investors will view relatively negative information more negatively and positive information more positively when its disclosure is mandatory than when it is voluntary (Reimsbach and Hahn 2015). Thus, investors' unfavorable responses to missing ESG goals and favorable responses to beating ESG goals are likely magnified by a mandatory (compared with a voluntary) reporting requirement. Recall that attributions to intrinsic and extrinsic motivations relate directly to perceptions of greenwashing in the ESG reporting environment. However, investors' perceptions of greenwashing are expected to also influence subsequent investment judgments. Although actual greenwashing behavior has been shown to harm corporate reputation and firm value (Cho et al. 2010; Walker and Wan 2012; Du 2015), our study focuses on investors' perceptions of greenwashing to test the extent to which psychological inferences can influence investment behavior.

Our theory indicates that a voluntary reporting regime will cause investors to attribute the decision to disclose missing an ESG goal to management acting in a forthcoming manner, implying intrinsic motives to management, whereas a mandatory reporting regime will cause investors to attribute the otherwise same news to the reporting requirement, implying extrinsic motivations to management. As such, the decision to voluntarily report an ESG outcome that misses the ESG goal is expected to result in a smaller increase in perceived greenwashing and a smaller decrease in willingness to invest than when the same disclosure is mandated. By contrast, when a company discloses an ESG outcome that beats the ESG goal, a voluntary reporting regime highlights management's extrinsic motives for disclosing the positive news, potentially resulting in a smaller decrease in perceived greenwashing and a smaller increase in willingness to invest than when reporting the same positive news is mandated. We state this hypothesis below along with our Attribution Theory-based expectation that perceptions of greenwashing mediate this interaction.

**H2:** Investors' increased perceptions of greenwashing in response to an ESG outcome missing a quantitative ESG goal and investors' decreased perceptions in response to the same ESG outcome beating a quantitative ESG goal will be amplified under a mandatory, relative to a voluntary, ESG reporting environment.

**H3:** Changes in investors' greenwashing perceptions will mediate the joint effects of quantitative ESG goal type and ESG reporting environment on changes in investment willingness.

<sup>9</sup> Although the number of negative ESG disclosures is likely to increase with a reporting mandate, many firms choose to voluntarily disclose negative ESG outcomes (KPMG 2020). For example, in 2016, Wells Fargo disclosed a set of goals to be completed by 2020 that included many qualitative goals as well as quantitative goals such as 8.5 million employee volunteer hours, 20,000 veteran employees, and Leadership in Energy and Environmental Design (LEED) certification for 35 percent of their buildings. In 2021, the company reported that they underperformed the volunteer hour goal by 200,000 hours, the veteran employee goal by 11,000 employees, and the LEED certification goal by 2 percent (Wells Fargo 2021). Firms may voluntarily disclose relatively poor ESG performance information to mitigate legal liability, satisfy investor demand, and/or report information that is consistent with industry peers or previous ESG reports.

### III. METHOD

#### Experimental Design and Participants

We use a  $2 \times 4$  between-participants experiment in which we manipulate *ESG Reporting Requirement* as voluntary or mandatory and *ESG Goal Type* as a quantitative goal that we operationalize so that the company either misses or beats it given an identical ESG outcome. Due to the wide variety of ESG goal types in practice, we also consider a qualitative goal condition, and we include a no goal condition as a baseline. Our dependent variables include participants' perceptions of greenwashing, and we measure the downstream effects of these judgments on participants' willingness to invest in the company (Elliott, Rennekamp, and White 2015).

We recruit 322 participants through Amazon Mechanical Turk and administer our study using Qualtrics software.<sup>10</sup> On average, participants are 39.2 years old, 35 percent are female (65 percent male), and 70.2 percent have obtained a bachelor's degree or higher.<sup>11</sup> Similar to the demographic information reported in prior accounting research that uses Amazon Mechanical Turk participants as proxies for nonprofessional investors (Rennekamp 2012; Asay and Hales 2018; Bucaro, Jackson, and Lill 2020), participants have an average of 17.08 years of full-time work experience and 9.03 years of investment experience, and they have completed an average of 1.88 accounting courses, 1.75 finance courses, and 1.85 economics courses. Finally, 89.8 percent of our participants have previously invested in individual company stock, and 92.2 percent plan to do so within the next five years.

#### Procedure

Participants begin the study by reading background information about the fictitious company, MicroTech Corporation, which operates in the software, services, and supplies industry. The information indicates that MicroTech is an established firm with a healthy market share that provides computing services and equipment for commercial enterprises. Participants are then provided with information about the current ESG reporting environment, in which we manipulate the regulatory reporting requirement for ESG outcomes. Following the ESG reporting requirement manipulation, participants answer attention check questions and view summary financial information from MicroTech's financial statements. Next, participants are provided with a corporate press release in which MicroTech announces a one-year goal to offset greenhouse gas emissions by planting trees.<sup>12</sup> Our ESG goal type manipulation for participants in the qualitative and quantitative goal conditions takes place within this press release. After viewing the ESG goal press release, participants indicate their perceptions of greenwashing and investment willingness. They are then told to assume one year has passed before viewing MicroTech's ESG performance announcement.<sup>13</sup>

The information provided in the ESG performance announcement is the same across all conditions, indicating that MicroTech planted 50,000 trees. Thus, we hold ESG outcomes constant, and the preceding manipulated goal announcement dictates how the firm's ESG performance is viewed *relative* to the goal.<sup>14</sup> Following the ESG outcome announcement, participants answer the same perceived greenwashing and investment willingness questions that they previously answered a second time before proceeding to post-experimental questions where we capture manipulation checks, process measures, and demographic information.

#### Independent Variables

##### *ESG Reporting Requirement*

We manipulate the regulatory requirement for ESG reporting by telling participants that the requirement for disclosing ESG performance is either voluntary or mandatory. Specifically, participants in the voluntary reporting

<sup>10</sup> Institutional review board consent was obtained at the institution where the study took place.

<sup>11</sup> We pay participants \$2.50 to complete the task, which took an average of 16.9 minutes. To participate, we require that participants are located in the United States, have completed over 100 approved Human Intelligence Tasks with a 95 percent or higher approval rating, and speak English as their first language. Additionally, we use TurkPrime (i.e., Cloud Research) screening features to block duplicate IP addresses, block suspicious geo-code locations, verify worker country location, and limit the sample to individuals that TurkPrime has identified as those who personally invest in the stock market.

<sup>12</sup> In our study, we inform participants that the ESG initiative offsets a *significant* portion of the company's total greenhouse gas emissions, and participants indicate that they believe the ESG initiative will have a significant impact on their investment risk and returns and the company's reputation. This suggests that we were successful in operationalizing a material ESG initiative across each of our manipulations.

<sup>13</sup> Participants in the "no goal" condition are not provided with a press release and, therefore, do not assess perceived greenwashing of an initial press release. However, we do capture these participants' initial investment willingness before the ESG performance announcement (see the Supplemental Analyses section).

<sup>14</sup> Although market reactions to ESG disclosures have been explored using archival data, one key challenge has been disentangling the reporting effects from the effects of the underlying ESG activities (Christensen et al. 2019). This design allows us to hold economic outcomes constant and isolate the effects ESG goals on investors' behavior. Thus, any observed differences in investors' judgments and decisions across conditions are attributable to the ESG goals instead of the firm's ESG outcome.

condition are told that the current regulations allow company management to choose whether or not they disclose the performance of any ESG activities that they choose to engage in. By contrast, participants in the mandatory reporting condition are told that the current regulations require company management to disclose the performance of any ESG activities that they choose to engage in.

### ESG Goal Type

We manipulate ESG goal type at four levels using a company press release that announces a one-year ESG goal to help offset greenhouse gas emissions by planting trees. Specifically, we manipulate whether the company announces a quantitative goal that includes a specific number of trees that we operationalize to miss or beat the subsequent outcome, a qualitative goal with no specific number of trees, or no ESG goal. In each condition that announces an ESG goal, the press release discusses the importance of trees to the environmental health of communities and indicates that the goal will be achieved by partnering with nonprofits and providing incentives for employees to volunteer for the cause. In the quantitative goal miss condition, MicroTech states a goal to plant 80,000 trees, and in the quantitative goal beat condition, MicroTech states a goal to plant 20,000 trees. Thus, the same outcome of 50,000 planted trees results in a miss or a beat of 30,000 trees, respectively. In the qualitative goal condition, the company sets a goal to plant trees, but a specific number of trees is not disclosed. Clearly, these manipulations do not categorically prove whether or not the firm was engaged in actual greenwashing, but we manipulate observable information that investors use to form their own perceptions of greenwashing.<sup>15</sup>

### Perceived Greenwashing Measure

We design a measure of participants' perceptions of corporate greenwashing guided by prior research.<sup>16</sup> Based on this body of research, we identify six potential dimensions of perceived greenwashing and design statements to capture perceptions of reliability, appropriateness, sincerity, effort, managements' intrinsic motives, and managements' extrinsic motives. Appendix A provides each of the statements used in our study. Participants indicate their level of agreement with each statement on a scale from 1 (completely disagree) to 8 (completely agree) after the company's ESG goal announcement and again after the ESG performance is reported for the qualitative and quantitative conditions. Because participants in the no goal condition do not view an ESG goal announcement, we only capture responses to these statements after the performance announcement for this group. Factor analysis reveals that the first five statements load on one factor with an eigenvalue of 3.30.<sup>17</sup> The five items account for 61.52 percent of the total variance, a first-to-second-component eigenvalue ratio of 4.51, and a high internal consistency rating (Cronbach's  $\alpha = 0.84$ ), suggesting that these five items reliably capture the construct of interest (Slocum-Gori and Zumbo 2011).<sup>18</sup>

To form our measure of *Perceived Greenwashing*, we average participants' responses to the five greenwashing questions and reverse code the measure so a larger (smaller) number indicates higher (lower) perceptions of greenwashing. Because we are interested in how investors' perceptions of greenwashing change in response to ESG performance announcements relative to specific goals, we compute our main dependent variable, *Change in Greenwashing Perceptions* (hereafter *Change in GWP*), by subtracting participants' *Perceived Greenwashing* after the ESG goal disclosure from participants' *Perceived Greenwashing* after the ESG performance disclosure.<sup>19</sup>

<sup>15</sup> Lange and Washburn (2012, 301) note that "corporate behavior is socially irresponsible only to the extent that observers perceive it as such." Thus, irrespective of whether actual greenwashing occurs or not, investors use available information to develop perceptions of greenwashing that may subsequently influence investment behavior.

<sup>16</sup> Parguel et al. (2011) complement many consumer research studies (Foreh and Grier 2003; Becker-Olsen, Cudmore, and Hill 2006; Ellen, Webb, and Mohr 2006) by documenting the importance of considering perceptions of managements' intrinsic and extrinsic motives for engaging in ESG activities. They find that management effort leads to higher perceived intrinsic motivations and positively impacts consumers' corporate brand evaluations (see also de Vries, Terwel, Ellemers, and Daamen 2015). Lock and Seele (2017) analyze greenwashing by developing and validating a scale for the perceived credibility of ESG communications using the subdimensions of truthfulness, sincerity, appropriateness, and understandability. They find that each subdimension is important to perceptions of ESG credibility except for understandability (Zahller, Arnold, and Roberts 2015; Spack, Board, Crighton, Kostka, and Ivory 2012).

<sup>17</sup> Results also reveal a second factor with an eigenvalue of 1.04. We perform a varimax rotation and find that the first five items clearly load on factor 1 and that item six clearly loads on factor 2. Item six captures participants' perceptions of managements' extrinsic motives, and, consistent with prior research (Parguel et al. 2011; de Vries et al. 2015), our results indicate that perceptions of managements' extrinsic motives for engaging in ESG activities captures a construct distinct from perceived greenwashing. Further, prior research that has identified perceived extrinsic motives to be important largely analyzes consumer behavior. In contrast to consumers, investors may financially benefit from management engaging in ESG activities for extrinsically motivated reasons. Thus, we exclude item six from our measure of perceived greenwashing. All inferences remain the same whether item six is included or excluded from the analyses.

<sup>18</sup> We use participants' responses after the ESG goal announcement for our factor analysis because participants have all the pertinent information to form perceptions of greenwashing at that point in time.

<sup>19</sup> In untabulated robustness analyses, we confirm that inferences for *Change in GWP* are the same if we exclude the effort item from the measure, ruling out the possibility that our results are simply due to investors believing that managers who miss a goal put in less effort than managers who achieve a goal.



## Investment Willingness Measure

To capture participants' willingness to invest, we ask them to rate the attractiveness of an investment in the company on a scale from 0 (very unattractive) to 10 (very attractive) and the likelihood that they would invest in the company on a scale from 0 (very unlikely) to 10 (very likely). Both measures reliably capture the same construct (Cronbach's  $\alpha = 0.94$ ). Following prior research, we average responses to these two questions for our measure of *Investment Willingness* (Elliott et al. 2015). Our *Change in Investment Willingness* (hereafter *Change in IW*) dependent measure is computed by subtracting participants' *Investment Willingness* after the ESG goal disclosure from participants' *Investment Willingness* after the ESG performance disclosure.

## IV. RESULTS

### Manipulation Checks

We test the efficacy of our ESG goal type manipulation by asking participants to select the type of goal announced by the company, and we provide them with the following options: (1) a goal to plant 20,000 trees, (2) a goal to plant 80,000 trees, (3) the company announced a goal but did not state the number of trees, and (4) the company did not announce a goal to plant trees. This question is answered correctly by 98.7 percent of participants in the quantitative goal beat condition, by 95.4 percent in the quantitative goal miss condition, by 87.5 percent in the qualitative goal condition, and by 57.9 percent in the no goal baseline condition. To test our ESG regulation manipulation, we ask participants to indicate whether the reporting of ESG performance is voluntary or mandatory. Participants in the voluntary (mandatory) reporting condition answer this manipulation check question correctly 95.9 percent (89.2 percent) of the time.<sup>20</sup>

### Tests of H1

Recall that participants provide greenwashing judgments twice—first after viewing the ESG goal disclosure and again after viewing the announced ESG outcome.<sup>21</sup> H1 predicts that, in response to the same ESG outcome, perceptions of greenwashing will increase when a firm misses a quantitative ESG goal and decrease when a firm beats a quantitative ESG goal or issues a qualitative goal. Because of the specific pattern of how investors' perceptions of greenwashing change in response to ESG outcome disclosures, we conduct tests to consider whether *Change in GWP* is significantly different than zero (i.e., no change) using a 95 percent confidence interval.

Our formal tests of H1 are reported in Table 1. Panel A of Table 1 shows that missing a quantitative goal significantly increases greenwashing perceptions whether the ESG reporting regulation is voluntary (mean = 0.26,  $t = 2.14$ ,  $p = 0.017$ ) or mandatory (mean = 0.47,  $t = 3.67$ ,  $p < 0.001$ ).<sup>22</sup> Collapsing across ESG reporting regulation conditions, we continue to observe a significant increase in average greenwashing perceptions for a missed quantitative goal (mean = 0.35,  $t = 4.05$ ,  $p < 0.001$ ). Additionally, beating a quantitative goal significantly decreases greenwashing perceptions whether the ESG reporting regulation is voluntary (mean = -0.39,  $t = -3.70$ ,  $p < 0.001$ ), mandatory (mean = -0.67,  $t = -4.64$ ,  $p < 0.001$ ), or collapsed across ESG regulation type (mean = -0.49,  $t = -5.71$ ,  $p < 0.001$ ). Finally, issuing a qualitative goal significantly decreases greenwashing perceptions once the outcome is disclosed within the voluntary condition (mean = -0.57,  $t = -4.32$ ,  $p < 0.001$ ) and mandatory condition (mean = -0.42,  $t = -3.33$ ,  $p < 0.001$ ) and collapsed across regulatory conditions (mean = -0.49,  $t = -5.38$ ,  $p < 0.001$ ). These results provide support for H1.<sup>23</sup>

In addition, to the formal tests of H1 reported in Panel A of Table 1, we report supplemental analyses that are similarly supportive of H1 and of our theory. Table 2, Panel A provides descriptive statistics, and Figure 1 plots participants' *Change in GWP* by experimental condition. Table 2, Panel B tabulates two-way ANOVA results for the effects of *ESG Regulation* and *ESG Goal Type* on *Change in GWP*. ANOVA results show an insignificant main effect of *ESG Regulation* ( $F = 0.078$ ,  $p = 0.781$ ), a significant main effect of *ESG Goal Type* ( $F = 32.715$ ,  $p < 0.001$ ), and an insignificant interaction of *ESG Goal Type*  $\times$  *ESG Regulation* ( $F = 2.204$ ,  $p = 0.113$ ). Untabulated simple effect tests show that the

<sup>20</sup> Inferences remain the same when those who answer the manipulation check questions incorrectly are removed. Thus, our analyses use the full sample.

<sup>21</sup> We do not capture initial greenwashing perceptions for participants in the no goal condition because they are not provided with a press release to assess. Therefore, our main analyses exclude the no goal condition, and we separately consider this condition in additional analyses.

<sup>22</sup> Due to the directional nature of our hypothesis tests, t-statistic p-values are one-tailed unless otherwise noted.

<sup>23</sup> We also ask participants to assess management's competence on a scale from 1 (not at all competent) to 7 (extremely competent). The untabulated ANOVA results reveal a main effect of *ESG Goal Type* ( $F_{2,236} = 8.19$ ,  $p < 0.001$ , two-tailed) such that investors view management as more competent when they issue a qualitative goal (mean = 5.60,  $t_{1,236} = 3.24$ ,  $p < 0.001$ , two-tailed) or when they beat a quantitative goal (mean = 5.65,  $t_{1,236} = 3.59$ ,  $p < 0.001$ , two-tailed) than when they miss (mean = 4.95) a quantitative goal. We observe no other significant main effects or interactions (all p-values  $> 0.45$ ), and including this variable in our model does not change our statistical inferences.

**TABLE 1**  
Tests of H1 and H2

**Panel A: Comparisons to Zero (Tests of H1)**

Regulation	Mean	95% LCI	95% UCI	t <sub>236</sub>	p-value
<i>Voluntary Quantitative Goal Miss</i>	0.26	0.02	0.49	2.14	0.017*
<i>Mandatory Quantitative Goal Miss</i>	0.47	0.22	0.72	3.67	<0.001*
<i>Average Quantitative Goal Miss</i>	0.35	0.18	0.53	4.05	<0.001*
<i>Voluntary Quantitative Goal Beat</i>	-0.39	-0.60	-0.18	-3.70	<0.001*
<i>Mandatory Quantitative Goal Beat</i>	-0.67	-0.95	-0.38	-4.64	<0.001*
<i>Average Quantitative Goal Beat</i>	-0.49	-0.66	-0.32	-5.71	<0.001*
<i>Voluntary Qualitative</i>	-0.57	-0.83	-0.31	-4.32	<0.001*
<i>Mandatory Qualitative</i>	-0.42	-0.67	-0.17	-3.33	<0.001*
<i>Average Qualitative</i>	-0.49	-0.67	-0.31	-5.38	<0.001*

**Panel B: Contrast Test<sup>a</sup> (Test of H2)**

Source	SS	df	MS	F-statistic	p-value
Contrast	30.451	1	30.451	45.13	<0.001
Residual between-cells variance	1.603	2	0.802	0.59	0.553
Total between-cells variance	33.994	3	11.331	16.79	<0.001
Residual (error)	109.995	163	0.675		
Total	142.049	166			
Contrast variance residual (q <sup>2</sup> )	0.40%				

\* One-tailed p-value given directional predictions.

The dependent variable, *Change in GWP*, is computed by subtracting participants' *Greenwashing Perceptions* after the ESG goal disclosure from participants' *Greenwashing Perceptions* after the ESG performance disclosure.

<sup>a</sup> We exclude the qualitative goal condition and assign the following contrast weights: +2 *Quantitative Goal Miss/Mandatory*, +1 *Quantitative Goal Miss/Voluntary*, -1 *Quantitative Goal Beat/Voluntary*, -2 *Quantitative Goal Beat/Mandatory*.

Variable Definitions:

*Greenwashing Perceptions* = average of participants' responses to five greenwashing questions on a scale from 1 to 8 (see [Appendix A](#));

*Qualitative* = participants view a nonspecific goal;

*Quantitative Goal Miss* = participants view a quantitative goal that was subsequently missed;

*Quantitative Goal Beat* = participants view a specific low goal that was subsequently beat;

*Voluntary* = reporting regulations do not require companies to disclose ESG performance; and

*Mandatory* = reporting regulations require companies to disclose ESG performance.

**TABLE 2**

*Change in GWP Results*

**Panel A: Descriptive Statistics—Adjusted Means (Std. Dev.), n = Sample Size**

	<u>Qualitative Goal</u>	<u>Quantitative Goal Beat</u>	<u>Quantitative Goal Miss</u>	<u>Total</u>
<i>Voluntary Reporting</i>	-0.57 (0.677) n = 36	-0.39 (0.868) n = 55	0.26 (0.861) n = 44	-0.23 (0.883) n = 135
<i>Mandatory Reporting</i>	-0.42 (0.732) n = 39	-0.67 (0.564) n = 30	0.47 (0.873) n = 38	-0.17 (0.886) n = 107
Total	-0.49 (0.705) n = 75	-0.49 (0.782) n = 85	0.35 (0.868) n = 82	-0.20 (0.883) n = 242

(continued on next page)

TABLE 2 (continued)

## Panel B: Two-Way ANOVA

Source	SS	df	MS	F-statistic	p-value
ESG Regulation	0.048	1	0.048	0.08	0.781
ESG Goal Type	40.594	2	20.297	32.72	<0.001
ESG Regulation $\times$ ESG Goal Type	2.735	2	1.368	2.20	0.113
Error	146.419	236	0.620		
Total	197.880	242			

## Panel C: Simple Effects (Supplemental Support for H2)

Source	df	t <sub>236</sub>	p-value
Effect of ESG Regulation for <i>Quantitative Goal Beat</i>	1	-1.53	0.063*
Effect of ESG Regulation for <i>Quantitative Goal Miss</i>	1	1.23	0.111*

\* One-tailed p-value given directional predictions.

## Variable Definitions:

*Change in GWP* = computed by subtracting participants' *Greenwashing Perceptions* after the ESG goal disclosure from participants' *Greenwashing Perceptions* after the ESG performance disclosure;

*Greenwashing Perceptions* = the average of participants' responses to five greenwashing questions on a scale from 1 to 8 (see Appendix A);

*Qualitative Goal* = participants view a nonspecific goal;

*Quantitative Goal Miss* = participants view a quantitative goal that was subsequently missed;

*Quantitative Goal Beat* = participants view a specific low goal that was subsequently beat;

*Voluntary Reporting* = reporting regulations do not require companies to disclose ESG performance; and

*Mandatory Reporting* = reporting regulations require companies to disclose ESG performance.

quantitative goal beat condition elicits lower *Change in GWP* than the quantitative goal miss condition (means = -0.49 versus 0.35,  $t = 7.14$ ,  $p < 0.001$ ) and that *Change in GWP* is lower when the company initially issues a qualitative goal than when the company issues a quantitative goal that it misses (means = -0.49 versus 0.35,  $t = 6.78$ ,  $p < 0.001$ ).<sup>24</sup>

## Tests of H2

H2 predicts that mandatory (compared to voluntary) ESG performance reporting will cause greenwashing perceptions to increase more when a quantitative ESG goal is missed and decrease more when a quantitative ESG goal is beat, holding the ESG outcome constant. Because of the specific form of this hypothesized interaction, we formally test H2 using custom contrast analysis and assign +2 to the quantitative goal miss/mandatory reporting condition, +1 to the quantitative goal miss/voluntary reporting condition, -1 to the quantitative goal beat/voluntary reporting condition, and -2 to the quantitative goal beat/mandatory reporting condition (Guggenmos, Piercey, and Agolia 2018). Cell means have good visual fit with our predicted contrast pattern (see Figure 1), and Table 1, Panel B shows that the contrast is significant ( $F = 45.125$ ,  $p < 0.001$ ). Additionally, the residual between-cells variance is insignificant ( $F = 0.594$ ,  $p = 0.553$ ), and the between-cells variance that is unexplained by our contrast weights is small ( $q^2 = 0.40$  percent). The results of this custom contrast test support H2.

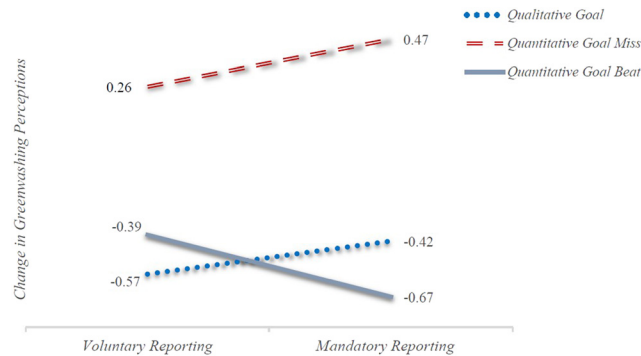
Table 2, Panel C shows the results of supplemental simple effect tests from the ANOVA that are similarly supportive of H2. Our simple effect tests show that a quantitative ESG goal that is beat decreases investors' greenwashing perceptions more when ESG performance reporting is mandated than when it is voluntary (means = -0.67 versus -0.39,  $t = -1.53$ ,  $p = 0.063$ ), and a quantitative ESG goal that is missed marginally increases investors' greenwashing perceptions more when ESG performance reporting is mandated than when it is voluntary (means = 0.47 versus 0.26,  $t = 1.23$ ,  $p = 0.111$ ).

## Tests of H3

H3 predicts that investors' perceptions of greenwashing will drive investment decisions such that effect of quantitative ESG goal type and ESG regulation on investment willingness is mediated by investors' greenwashing perceptions.

<sup>24</sup> Inferences are identical when tested separately within both the mandatory and voluntary reporting conditions. We observe no significant difference between the quantitative goal beat condition and qualitative goal condition (means = -0.49 versus -0.49,  $t = -0.28$ ,  $p = 0.777$ , two-tailed; untabulated).

**FIGURE 1**  
**Change in Greenwashing Perceptions Pattern of Results**



#### Variable Definitions:

*Change in Greenwashing Perceptions* = computed by subtracting participants' *Greenwashing Perceptions* after the ESG goal disclosure from participants' *Greenwashing Perceptions* after the ESG performance disclosure;

*Greenwashing Perceptions* = the average of participants' responses to five greenwashing questions on a scale from 1 to 8;

*Qualitative Goal* = participants view a nonspecific goal;

*Quantitative Goal Miss* = participants view a quantitative goal that was subsequently missed;

*Quantitative Goal Beat* = participants view a quantitative goal that was subsequently beat;

*Voluntary Reporting* = reporting regulations do not require companies to disclose ESG performance; and

*Mandatory Reporting* = reporting regulations require companies to disclose ESG performance.

(The full-color version is available online.)

Summary results for H3 are illustrated in Figure 2. Because our hypothesis predicts mediation of the interaction of quantitative ESG goal type and ESG regulation on investors' willingness to invest, we test H3 using the PROCESS moderated mediation model number 7 with 10,000 bootstrapped samples and a 90 percent confidence interval. We assign miss versus beat quantitative goal type as the independent variable ( $X$ ), mandatory versus voluntary ESG regulation as the moderating independent variable ( $W$ ), *Change in GWP* as the mediator ( $M$ ), and *Change in IW* as the dependent variable ( $Y$ ).

Consistent with our prediction, we find that investors' *Change in GWP* is significantly impacted by quantitative ESG Goal Type ( $t = 3.74$ ,  $p < 0.001$ ), ESG Regulation ( $t = 1.83$ ,  $p = 0.035$ ), and the interaction ( $t = 1.87$ ,  $p = 0.032$ ). Next, *Change in GWP* has a significantly negative effect on participants' *Change in IW* ( $t = 9.93$ ,  $p < 0.001$ ), and the direct effect when controlling for our predicted mediator becomes insignificant ( $t = 0.39$ ,  $p = 0.700$ , two-tailed). Finally, bootstrap sample estimates show that the indirect effect of quantitative ESG goal type is significant for the mandatory reporting condition (confidence interval: 0.75 to 1.51), the voluntary reporting condition (confidence interval: 0.35 to 0.97), and the difference between conditional indirect effects (confidence interval:  $-0.91$  to  $-0.08$ ). These results support H3.

## Supplemental Analyses

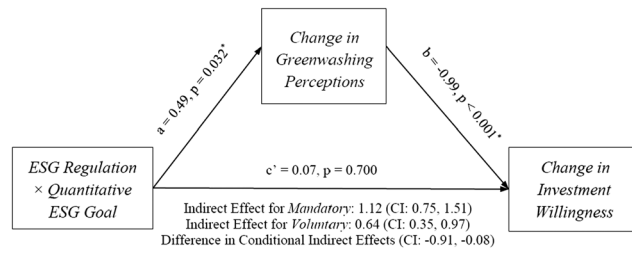
### Investment Willingness Results

Because we observe that investors' greenwashing perceptions drive the effects of ESG goal type and ESG reporting regulation on investment decisions in H3, we reperform additional analyses using participants' *Change in IW* as the main dependent variable. Table 3, Panel A provides descriptive statistics for participants' *Change in IW* by experimental condition, Panel B shows the two-way ANOVA results, Panel C provides planned contrast test results, and Panel D shows the results of our simple effect tests.<sup>25</sup> Figure 3 plots the means by experimental condition and shows that cell means have good visual fit with our predicted contrast pattern. We observe a significant contrast ( $F = 26.046$ ,  $p < 0.001$ ), the residual between-cells variance is insignificant ( $F = 0.003$ ,  $p = 0.997$ ), and the between-cells variance that is unexplained

<sup>25</sup> Consistent with theory that suggests that investors' willingness to invest will decrease (increase) as perceptions of greenwashing increase (decrease), we assign +2 to the quantitative goal beat/mandatory reporting condition, +1 to the quantitative goal beat/voluntary reporting condition, -1 to the quantitative goal miss/voluntary reporting condition, and -2 to the quantitative goal miss/mandatory reporting condition (Guggenmos et al. 2018).



**FIGURE 2**  
**Mediation Results (H3)**



\* One-tailed equivalent p-value given directional predictions.

Figure 2 presents our moderated mediation model with *ESG Regulation* (mandatory versus voluntary) and *Quantitative ESG Goal* (miss versus beat) as the independent variables, *Change in Greenwashing Perceptions* as the mediator, and *Change in Investment Willingness* as the dependent variable. We use Model 7 of the PROCESS macro (Hayes 2018) to estimate the path coefficients and indirect effects via 10,000 bootstrapped samples and a 90 percent confidence interval.

**TABLE 3**  
**Change in IW Results**

**Panel A: Descriptive Statistics—Mean (Std. Dev.), n = Sample Size**

	<u>Qualitative Goal</u>	<u>Quantitative Goal Beat</u>	<u>Quantitative Goal Miss</u>	<u>Total</u>
<i>Voluntary Reporting</i>	0.58 (0.742) n = 36	0.31 (1.671) n = 55	-0.19 (1.030) n = 44	0.22 (1.305) n = 135
<i>Mandatory Reporting</i>	0.56 (1.034) n = 39	0.95 (0.894) n = 30	-0.57 (1.274) n = 38	0.27 (1.258) n = 107
Total	0.57 (0.899) n = 75	0.54 (1.472) n = 85	-0.37 (1.158) n = 82	0.24 (1.282) n = 242

**Panel B: Two-Way ANOVA**

Source	SS	df	MS	F-statistic	p-value
<i>ESG Goal Type</i>	51.327	2	25.664	17.84	<0.001
<i>ESG Regulation</i>	0.403	1	0.403	0.28	0.597
<i>ESG Goal Type</i> × <i>ESG Regulation</i>	10.468	2	5.234	3.64	0.028
Error	339.454	236	1.438		
Total	410.250	242			

**Panel C: Contrast Test<sup>a</sup>**

Source	SS	df	MS	F-statistic	p-value
Contrast	44.679	1	44.679	26.05	<0.001
Residual between-cells variance	0.018	2	0.009	0.01	0.997
Total between-cells variance	51.431	3	17.144	9.99	<0.001
Residual (error)	279.614	163	1.715		
Total	324.311	166			
Contrast variance residual ( $q^2$ )	3.41%				

(continued on next page)

TABLE 3 (continued)

## Panel D: Simple Effects

Source	df	t <sub>236</sub>	p-value
Effect of <i>ESG Regulation</i> for <i>Quantitative Goal Beat</i>	1	2.35	0.010*
Effect of <i>ESG Regulation</i> for <i>Quantitative Goal Miss</i>	1	-1.40	0.081*

\* One-tailed p-values given directional predictions.

<sup>a</sup> We exclude the qualitative goal condition and assign the following contrast weights: +2 *Quantitative Goal Beat/Mandatory*, +1 *Quantitative Goal Beat/Voluntary*, -1 *Quantitative Goal Miss/Voluntary*, -2 *Quantitative Goal Miss/Mandatory*.

## Variable Definitions:

*Change in IW* = computed by subtracting participants' *Investment Willingness* after the ESG goal disclosure from participants' *Investment Willingness* after the ESG performance disclosure;

*Investment Willingness* = the average of participants' responses to investment attractiveness and investment likelihood on a scale from 0 to 10;

*Qualitative Goal* = participants view a nonspecific directional goal;

*Quantitative Goal Miss* = participants view a quantitative goal that was subsequently missed;

*Quantitative Goal Beat* = participants view a quantitative goal that was subsequently beat;

*Voluntary Reporting* = reporting regulations do not require companies to disclose ESG performance; and

*Mandatory Reporting* = reporting regulations require companies to disclose ESG performance.

by our contrast weights is small ( $q^2 = 3.41$  percent). This custom contrast analysis suggests that the joint effect of *ESG Goal Type* and *ESG Regulation* on investors' *Change in IW* is consistent with the predicted pattern. The two-way ANOVA results also supplement this finding, showing a significant interaction of *ESG Goal Type* and *ESG Regulation* on investors' *Change in IW* ( $F = 3.639$ ,  $p = 0.028$ ). Follow-up simple effect tests confirm our predicted pattern of results by showing that participants' *Change in IW* in the company with a quantitative ESG goal that is beat is significantly higher when ESG performance reporting is mandated than when it is voluntary (means = 0.95 versus 0.31,  $t = 2.35$ ,  $p = 0.010$ ), and *Change in IW* in a company with a quantitative ESG goal that is missed decreases more when reporting is mandated than when it is voluntary (means = -0.57 versus -0.19,  $t = -1.40$ ,  $p = 0.081$ ).

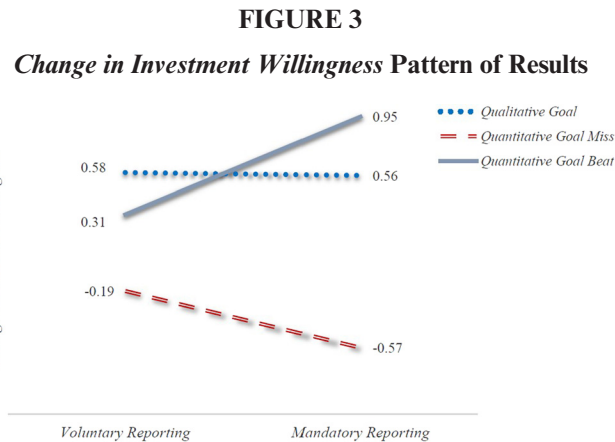
**ESG Goal Announcement Results**

Our design allows us to analyze whether participants' judgments after ESG outcomes are disclosed are affected by their initial reactions to the ESG goal disclosure. We perform a two-way ANOVA on initial greenwashing perceptions (untabulated) at the time the goal was announced and before the performance was announced, and we find an insignificant main effect of *ESG Goal Type* ( $F_{2,236} = 2.04$ ,  $p = 0.132$ ) and insignificant effects of both *ESG Regulation* ( $F_{1,236} < 0.01$ ,  $p = 0.982$ , two-tailed) and the interaction ( $F_{2,236} = 0.33$ ,  $p = 0.720$ ). Next, we analyze investors' willingness to invest at the time the ESG goals are announced. Untabulated ANOVA results show no differences for *ESG Goal Type* ( $F_{2,236} = 0.106$ ,  $p = 0.900$ ), *ESG Regulation* ( $F_{1,236} = 0.659$ ,  $p = 0.418$ ), or the interaction ( $F_{2,236} = 0.436$ ,  $p = 0.647$ ). Thus, investors' reactions to ESG goals appear to be primarily driven by the ESG outcome disclosure in light of the goal announcement.

**No Goal Conditions**

Because companies frequently announce ESG outcomes without an accompanying goal, we include a condition in which no ESG goal is announced and compare these baseline judgments and decisions to the ESG goal type conditions. Because participants in the no goal condition did not see a goal announcement, we were unable to solicit greenwashing perceptions for this condition until after the performance announcement. However, participants' investment willingness was solicited both before and after the performance announcement in the no goal condition. Therefore, we analyze *Changes in IW* for the no goal condition and find that investors increase investment willingness after the ESG outcomes are announced for the no goal condition (mean = 0.20, 95 percent lower confidence interval: 0.02, upper confidence interval: 0.38) but that they do so to a lesser extent than both the qualitative goal condition (mean = 0.57,  $t_{1,314} = 2.08$ ,  $p = 0.039$ , two-tailed) and the quantitative goal beat condition (mean = 0.54,  $t_{1,314} = 2.41$ ,  $p = 0.017$ , two-tailed). Conversely, missing a quantitative ESG goal significantly decreases investment willingness compared with not announcing an ESG goal (means = -0.37 versus 0.20,  $t_{1,314} = 3.31$ ,  $p < 0.001$ , two-tailed).<sup>26</sup> Taken together, these results suggest that, relative to not disclosing an ESG goal, disclosing a qualitative ESG goal or a quantitative ESG goal that is

<sup>26</sup> Inferences remain the same when comparisons are made separately within each ESG regulation condition.



#### Variable Definitions:

*Change in Investment Willingness* = computed by subtracting participants' *Investment Willingness* after the ESG goal disclosure from participants' *Investment Willingness* after the ESG performance disclosure;

*Investment Willingness* = the average of participants' responses to investment attractiveness and investment likelihood on a scale from 0 to 10;

*Qualitative Goal* = participants view a nonspecific, directional goal;

*Quantitative Goal Miss* = participants view a quantitative goal that was subsequently missed;

*Quantitative Goal Beat* = participants view a quantitative goal that was subsequently beat;

*Voluntary Reporting* = reporting regulations do not require companies to disclose ESG performance; and

*Mandatory Reporting* = reporting regulations require companies to disclose ESG performance.

(The full-color version is available online.)

beat may provide incremental benefits to the firm once outcomes are subsequently disclosed. However, a firm may benefit more from not disclosing an ESG goal than from disclosing a goal that it subsequently misses.

## V. CONCLUSION

Amid the ongoing discussion regarding ESG disclosure requirements (SEC 2021; IFRS 2021b), our study provides important insights to companies, investors, and regulators, and our experimental design allows us to test potential consequences of moving from a voluntary to a mandatory regulatory environment. Given that investors value the broader social impact of ESG activities, investors' perceptions of managers' commitment to such behavior is crucial to understanding their investment response. Accordingly, we provide evidence that investor judgments are driven by their perceptions of greenwashing, suggesting that this mediating variable is key to understanding and affecting future changes to disclosure requirements as well as managers' choices regarding ESG goal setting. Further, given the attributional consequences of disclosure policy, we find that requiring ESG outcome disclosures can exacerbate the negative effects of missing quantitative ESG goals and magnifying the positive effects of beating quantitative ESG goals, holding the outcome constant.

This improved understanding of how investment judgments are influenced by managers' choices about ESG goal disclosures informs regulators that are currently contemplating ways to make reporting more consistent, reliable, and transparent. We identify an incentive environment for managers' different ESG reporting choices and further demonstrate how reporting mandates magnify these incentives. Holding ESG outcomes constant, managers are punished for missing an ESG goal and rewarded for achieving an ESG goal, and this effect is magnified under mandatory ESG performance reporting regimes. Accordingly, managers are incentivized to provide modest, easily achievable goals, particularly when outcome disclosure is mandatory, thus exacerbating the concern that firms already set unambitious goals to meet their targets (*The New York Times* 2021). This finding is problematic given that prior research shows that goals most effectively increase effort when they are both specific and challenging (Locke and Latham 1990, 2002). Thus, when these results are considered within the broader literature, mandated disclosures have the potential unintended consequence of having a downward effect on ESG activities globally.

It is therefore important to consider how these unintended consequences develop. In contrast to evaluating actual corporate greenwashing behaviors, we contribute to this discussion by demonstrating how greenwashing *perceptions* mediate these investor outcomes. Given the potentially crucial role of greenwashing perceptions on investor decisions

(a fundamental consideration of managers), future research and potential regulatory action would benefit from its consideration. For example, future research can examine how to determine and communicate optimal goals (e.g., to maximize ESG outcomes) while limiting the consequences associated with greenwashing perceptions of investors.

Following Kerlinger and Lee (2000, 459) principle to “design, plan, and conduct research so that the experimental conditions are as different as possible” along the theoretical construct of interest, we operationalize missing and beating quantitative goals by relatively large magnitudes. Future research could test whether the effects documented here also hold for smaller magnitudes. Additionally, we hold all the information in each press release constant across experimental conditions except for the reported performance numbers. Although this helps to ensure internal validity, it could create differences in whether the tone of the press release is perceived to match the reported results. Future research may explore the effects of other possible ESG disclosure strategies that a company could use that we do not examine here. For example, ESG goal disclosures, such as quantitative goals expressed in a range or coupled with data visualizations, could also be fruitful areas to explore. The perceived greenwashing measure developed in this study can be used to further develop this important stream of research.

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## APPENDIX A

### Greenwashing Perception Measure Statements

Item	Dimension	Statement
1	Reliability	The statements in MicroTech's press release are accurate.
2	Appropriate	It is appropriate for MicroTech to engage in the initiative stated in the press release.
3	Sincerity	The press release reflects the genuine intentions of MicroTech's management team.
4	Effort	MicroTech's management team did their best to accomplish the tree planting initiative.
5	Intrinsic Motive	MicroTech's management team is primarily motivated to engage in this initiative because they want to have a positive impact on society (e.g., improve the natural environment).
6	Extrinsic Motive	MicroTech's management team is primarily motivated to engage in this initiative because they want to have a positive impact on their company (e.g., improve the company's image, increase profits).