



# Sustainability priorities, corporate strategy, and investor behavior

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## Abstract

Using a sequential experiment, this study examines whether integration of material environmental, social, and governance (ESG) priorities into corporate strategy impacts investors' short- and long-term stock price assessments and investment allocation. In our examination, we consider the potential moderating effect of financial performance. We find that integration of ESG priorities into strategy does not have a significant effect on investors' price assessments or investment allocation. This is true regardless of the trend in the company's financial performance. Our results hold across various demographics and the levels of investment knowledge and investment experience. Investors' perception of relevance and reliability of material ESG information, however, has a mediating effect on their long-term price assessment and investment allocation. Overall, our findings suggest that any future requirements on disclosure of ESG information by regulators and standard setters should aim to improve investors' perception of the relevance and reliability of that information.

## JEL CLASSIFICATION

M14, Q55, G11

## KEYWORDS

corporate strategy, environmental, social, and governance (ESG) reports, investment decisions, sustainability reports

## 1 | INTRODUCTION

A growing number of companies have been reporting on their performance in environmental, social, and governance (ESG) areas.<sup>1</sup> Environmental, social, and governance reports, often referred to as Sustainability reports or Corporate Social Responsibility (CSR) reports, are normally issued separately from the annual and quarterly financial reports and describe companies' investments and outcomes in a variety of activities that extend beyond basic compliance with applicable laws and regulations. Depending on the company, ESG reports address topics ranging from carbon emission to water management to diversity to child labor.

The increase in the supply of ESG information has paralleled investors' demand for the same. As the world becomes more developed and more interested in environmental and social issues because of global challenges such as climate change and scarcity of natural resources, investors are increasingly calling for more ESG disclosures. Over 1,700 investors, representing about US \$62 trillion in assets under management, have signed the UN-backed Principles for Responsible Investment since their launch in 2006 (UN PRI 2017). BlackRock, the biggest investor in public companies in the world with \$6 trillion under management, recently sent a letter to CEOs of public companies stating that they must show how they contribute to society, or risk losing the money-management firm's support (BlackRock 2018).

Regulation of ESG disclosure, along with ESG-related investigations of and enforcement actions against companies, also is increasing. In 2010, the U.S. Environmental Protection Agency began requiring large emitters of greenhouse gases to collect and report data with respect to their greenhouse gas emissions (EPA 2009). That same year, the Securities and Exchange Commission (SEC) issued guidance to public companies about how to disclose climate change-related matters (SEC 2010),<sup>2</sup> and Congress passed the Dodd-Frank Act, which added more ESG disclosure requirements (Dodd-Frank 2010).<sup>3</sup> Currently, the SEC is considering modernizing Regulation S-K requirements for company disclosure relating to sustainability (SEC 2016),<sup>4</sup> which would likely increase ESG disclosure.

Non-U.S. regulatory requirements are also increasing. For example, an EU directive requiring large public interest companies to address policies, risks, and results relating to ESG matters in their annual reports came into effect for financial year 2017 (EU Directive 2014). The new requirement is expected to increase the number of EU companies producing sustainability reports to nearly 7,000. The London Stock Exchange Group issued new ESG reporting guidance for climate change and sustainability-related matters in February 2017 (LSEG 2017).

Although regulators and investors appear to desire or require information about companies' ESG performance, whether and when (i.e., under what conditions) investors use that information in their decisions has been the subject of many survey, archival and experimental studies. For example, an International Federation of Accountants survey finds that investors increasingly use ESG disclosures to understand a company's ESG priorities and how they impact overall performance over a longer time horizon (IFAC 2012). A 2015 survey by the CFA Institute indicates that 73% of respondents (portfolio managers and research analysts) take ESG information into account in their investment analyses and decisions (CFA 2015). The results of these survey studies indicate that investors increasingly demand ESG information and use it in their decisions. Investors also pay attention to the long-term impact of ESG activities on overall performance.

Archival studies on whether and when investors use ESG disclosures have reached varied and sometimes contradictory conclusions. Some archival studies have questioned the relevance of ESG information (e.g., Campbell & Slack, 2011; Deegan & Rankin, 1997) and investors' commitment to ESG priorities or their ability to convert their commitment into practice (e.g., Bailey, Klempner, & Zoffer, 2016). However, the majority have shown that ESG reports have an impact on corporate valuation and are of decision-making relevance for investors (e.g., Ansari, Cajias, & Bienert, 2015; Cohen, Holder-Webb, Nath, & Wood, 2011; Harkins & Arndt, 2012; Khan, Serafeim, & Yoon, 2016; Solomon & Solomon, 2006; Thompson & Cowton, 2004). Experimental studies also report mixed results. For example, Milne and Chan (1999) find that social disclosures only have a marginal impact on investment decisions. Nevertheless, most experimental studies have shown that ESG information impacts corporate valuation and investors' decisions (Chan & Milne, 1999; Holm & Rikhardsson, 2008; Martin & Moser, 2016; Reimsbach & Hahn, 2015), especially in the presence of ESG assurance and strategic relevance of ESG factors (e.g., Brown-Liburd & Zamora, 2015; Cheng, Green, & Chi Wa Ko, 2015).

Overall, regulatory requirements, and the results of survey, archival, and experimental studies, conclude that ESG reports influence investors' decisions, that is, they represent value-relevant information. The conclusion that ESG reports influence investors' decisions is consistent with that of a meta-analysis by Margolis, Elfenbein, and Walsh (2007) who review 251 studies and find that the bulk of the evidence indicates that ESG initiatives have a positive, but small, impact on firms and are relevant to investors and influential in their decisions.

In this study, we take investors' use (whether investors use ESG disclosures) as given and aim to advance our understanding of *when* investors use ESG disclosures. In particular, we examine investors' short- and long-term stock price assessments and investment allocation in response to a company's inclusion in its strategy of ESG factors that are material for a company's industry (hereafter, ESG priorities), that is, priorities that have the greatest impact on the company's ability to create sustainable shareholder value. In our examination, we consider the potential moderating effect of financial performance.

We posit that the investors' stock price revisions will be greater when ESG priorities are integrated into corporate strategy than when they are not, and expect that integration to influence the amount of money investors are willing to invest in a company. We also conjecture that the company's financial performance will moderate the relationship between the integration of ESG priorities into company strategy and investors' decisions. Furthermore, we conjecture that non-results in our experiment may be due to investors not perceiving the integration of ESG priorities into corporate strategy as being important or meaningful to risk/return analysis.

To test our hypotheses, we conduct a between-subject  $2 \times 2$  sequential experiment using graduate students in a Master's of Accountancy program as participants. Participants were provided industry, company, and selected financial data, manipulated to show improving or declining sales and earnings by about 10%, for a medical device company (disguised).<sup>5</sup> Participants were asked to assess the stock price in the short and long run and to decide what portion of their additional funds to invest in the company. They were then provided with the ESG information for the same company, manipulated for the ESG priorities to be included in the company's strategy or not, and asked to repeat their stock price assessments and investment allocation.

We find that the integration of ESG priorities into strategy does not have a significant effect on investors' stock price assessments or investment allocation. This is true irrespective of the trend in financial performance. Our results hold across various demographics and the levels of investment knowledge and investment experience.

In addition, ANOVA results using perceived relevance and reliability as the dependent variable support our conjecture that our non-results may be due to investors not perceiving the integration of ESG priorities into corporate strategy as being important or meaningful to risk/return analysis. Further analysis, however, shows that investors' perceptions of relevance and reliability of information relating to ESG priorities have a mediating effect on their long-term price assessment and investment allocation. In particular, higher perceived relevance and reliability of ESG information increases investors' assessment of stock price in the long run and the amount they are willing to invest in the company. In addition, perceived relevance and reliability interact with financial performance and ESG integration, respectively, to affect stock price assessment in the short run; and, perceived relevance interacts with ESG integration to affect investment allocation. This is important, because it is investors' perceptions, and not the actual levels, of relevance and reliability, that drive investment decisions.

Many studies have examined the impact of various aspects of ESG reporting on investor decisions and recommendations. However, a number of studies have used archival data (e.g., Ansari et al., 2015; Campbell & Slack, 2011; Deegan & Rankin, 1997; Solomon & Solomon, 2006; Thompson & Cowton, 2004), our study uses a sequential experiment, allowing us to minimize the effect of confounding factors that may contaminate the results. This in part is in response to earlier studies that have called for experimental studies that address questions about the effects of ESG disclosures (e.g., Evans, 2012; Moser & Martin, 2012).

Several studies (e.g., Brown-Liburd & Zamora, 2015; Chan & Milne, 1999; Cheng et al., 2015; Holm & Rikhardsson, 2008; Liyanarachchi & Milne, 2005; Martin & Moser, 2016; Milne & Patten, 2002) have used an experimental approach. Two investigate questions related to this study's. Cheng et al. (2015) examine the effect of strategic relevance of reported ESG information and its assurance on investors' decisions. They conduct two experiments. In experiment one, they manipulate strategic relevance as high or low depending on company strategy – ESG differentiation versus cost leadership. In experiment two, they manipulate strategic alignment of ESG indicators with company strategy holding strategy (which incorporates social responsibility concerns) constant. In both experiments, the presence and absence of assurance is also manipulated.

We build our experiment around Sustainability Accounting Standards Board's materiality map, which may or may not be the same as a particular company's strategy, based on the argument that these ESG priorities are relevant to the industry and useful to investors (see footnote 6). We vary the strategy either to include or exclude ESG priorities because in reality no company has a pure ESG differentiated strategy. We do not manipulate assurance, but instead convey the reliability of the report via reference to Dow Jones Sustainability and two other indices. Our experiment thus complements Cheng et al.'s regarding the effect on investor decision-making of ESG disclosures that indicate strategic integration, but uses a different approach. In addition, our experiment differs substantially from Cheng et al. in that we consider the moderating impact of financial performance for the reasons discussed in hypotheses development section.

Martin and Moser (2016) also examine investors' reaction to managers' green investment disclosures. However, their experiment is specifically designed to isolate investors' reactions that reflect the value they (investors) place on societal benefits using a scenario in which the social responsibility disclosures have no predictive value for future earnings and cash flows. In particular, in their experimental setting, the impact of a manager's green investment to reduce carbon emissions is fully reflected in the company's current earnings with no effect on future, and investors know that the financial costs to the company's green investment always exceed the financial benefits and thus always lower shareholder value. In our experiment, we recognize that most ESG activities affect the company's future earnings and cash flows and we capture investors' assessment of the impacts of the company's activities on the matrix of their interests (societal benefits, shareholder value, or other). Accordingly, our research questions are completely different from Martin and Moser's.

In addition to the differences stated above, our contribution is novel because, to the best of our knowledge, no one has examined the effect on non-professional investors' decisions of integrating ESG priorities into strategy along with the potential moderating effect of financial performance. A better understanding of the effect of ESG disclosures on investors' decisions contributes to the decision usefulness, signaling, shareholder, and stakeholder theories. It also informs regulators and standard setters in deciding whether to require disclosure of information about firm performance with respect to ESG priorities, projected ESG risks and the financial impact of ESG initiatives. Because there is a risk that investors will be overly influenced by firms' superficial "greenwashing" disclosures, our study of investor reactions to disclosure that demonstrates operational, strategic integration of ESG initiatives may be instructive.

We also add to the findings of prior studies that ESG disclosure is informative by demonstrating that investors' perceptions of relevance and reliability of material ESG information have a mediating effect on the relationship between integration of ESG priorities and investors' long-term price assessment and investment allocation, and that financial performance has a stronger

effect on investors' long-term price assessment and investment allocation when ESG priorities are integrated into corporate strategy after controlling for perceived relevance and reliability. Our findings call for investigation of additional potential moderating and/or mediating variables.

The remainder of the paper is organized as follows. The next section develops our hypotheses. Section 3 describes the research design, while Section 4 presents the results. Summary and conclusions and avenues for further research are discussed in Section 5.

## 2 | HYPOTHESES DEVELOPMENT

The impact of material<sup>6</sup> ESG information on investors' decisions may vary depending on various factors such as the legitimacy (purpose) of ESG initiatives, the financial performance of the entity, and the transparency and reliability (e.g., verification by an independent professional firm) of the ESG report. In this study, we convey transparency and reliability by reference to Dow Jones Sustainability and other indices, and focus on legitimacy and the potential moderating impact of financial performance.

The impact of ESG reporting on investors' decisions may vary depending on the investors' perception of the legitimacy of the company's ESG initiatives. Even when a company's sustainability report is positive and informative, the report in and of itself does not signal credible commitment to ESG priorities. Investors may question the legitimacy (purpose) of the ESG initiatives because of the publicity around companies' tendency to greenwash (Dahl, 2010). In fact, it is estimated that over 40% of current disclosures on sustainability topics contain standardized, boilerplate, language.<sup>7</sup>

It is difficult for investors to determine which companies are genuinely committed to sustainability because of information asymmetry (Delmas & Burbano, 2011; Lydenberg, 2005). Management can reduce the information asymmetry through signals. Integration of ESG priorities into a company's strategy, that is, an overall strategy that dedicates resources to improving the company's performance in ESG areas and simultaneously increasing shareholder value, is a very strong signal about the purpose/legitimacy of ESG investments.

When a company's ESG report shows that ESG priorities are an integral part of the company's strategy, that report will be perceived as more legitimate than an ESG report that shows no deeper commitment by the company. A report that does not show integration of ESG priorities into the company's strategy may be viewed as reporting for public relations purposes rather than for legitimate risk-management reasons. From an investor's perspective, haphazard investment in ESG initiatives may hurt the financial performance of the company, whereas a well-planned investment with an eye on shareholder value may improve financial performance.

Prior research has drawn on attribution theory to argue that investors look for supplementary credibility cues when assessing information that is perceived to be incentive-consistent (e.g., Brown-Liburd & Zamora, 2015; Hirst, Koonce, & Simko, 1995; Hutton, Miller, & Skinner, 2003). The credibility argument also applies to legitimacy. Investors will be concerned with the legitimacy of ESG priorities because they are incentive-consistent information. Integration of ESG priorities into strategy, and disclosure outlining the ways in which the company has operationalized its ESG initiatives, should help reduce investors' legitimacy ("greenwashing") concerns. Non-integration of ESG priorities into strategy could even be viewed as a waste of shareholder resources. Thus, we expect the ESG disclosure effect on investors' decisions to be stronger when ESG priorities are integrated into corporate strategy.

Investors' reaction to ESG disclosures by a company may also vary depending on investors' perceptions of the impact of ESG priorities on the financial performance of the company. On the one hand, investors may believe that there is a tradeoff between ESG investment and financial performance, and that ESG investment reduces shareholder value. For example, investing in alternative sources of energy improves the quality of the environment, but may reduce profit.

On the other hand, investors may expect ESG investments to increase shareholder value for various reasons.<sup>8</sup> ESG investments may payoff in the long run (Renneboog et al., 2008). For example, investment in alternative sources of energy may eventually lead to lower energy costs. In addition, firms with strong ESG performance may be better prepared to deal with sudden changes in ESG-related regulation and consumer preferences (Jagannathan, Ravikumar, & Sammon, 2017). Corporate social responsibility may be positively correlated with improved shareholder value because such policies increase managerial competencies, contribute to organizational knowledge about the environments in which the company operates, enhance organizational efficiency, and build a positive reputation (Orlitzky, Schmidt, & Rynes, 2003). Strong ESG performance may lower a company's cost of equity capital or reduce its potential liability exposure to enforcement actions (Godfrey, Merrill, & Hansen, 2009; Koh, Qian, & Wang, 2014). Companies may also gain a competitive advantage (McWilliams & Siegel, 2011) and improve their market share by implementing efficiency measures and reducing costs, as well as by appealing to consumers who value certain ESG measures (Bansal & Roth, 2000). Companies may capitalize on ESG investments if those measures appeal to the values



of consumers in their target market and create a positive reputation for their products (Sen & Bhattacharya, 2001). Studies have shown a positive relationship between a publicly traded firms' environmental performances and their intangible asset values (Konar & Cohen, 2001). This would be consistent with stakeholders' theory, according to which a company's responsibility extends beyond simply creating value for the shareholders (Freeman, Harrison, Wicks, Parmar, & De Colle, 2010; McWilliams & Siegel, 2001; Phillips, 2003). Under this viewpoint, shareholder value is improved and preserved when the company takes care of its social and ecological environments.

Based on the discussion in the previous two paragraphs, we argue that if financial performance is declining, investors may attribute the decline to ESG investment (perhaps as a drag on profit), and expect the negative financial effect of ESG investments to be permanent when ESG priorities are integrated into strategy, and temporary otherwise. This would result in lower stock price revisions and investment amount. On the other hand, if financial performance is improving, investors may believe that the integration of ESG priorities into strategy has helped the company to reduce its operating costs, reduce its cost of capital, and/or improve its reputation and popularity. In this case, integration of ESG priorities into strategy would be viewed positively by investors and result in higher stock price revisions and investment amount.<sup>9</sup>

To sum up, we would expect that ESG disclosure will result in stronger investor reactions when ESG priorities are integrated into corporate strategy than when they are not. We would also expect that, compared to non-integration, integration into strategy of ESG priorities will lead to stronger positive reactions when financial performance is improving, and stronger negative reactions when financial performance is declining, an interaction between integration and financial performance. Specifically, when financial performance is improving, strategic integration of ESG priorities will lead to greater positive price revisions and more investment allocation compared to non-integration; however, when financial performance is declining, strategic integration will lead to greater negative price revisions and less investment allocation compared to non-integration. Formally:

*H1a* Investors' stock price revisions will be greater when ESG priorities are integrated into corporate strategy than when they are not, and their positive reaction will be stronger when the company's financial performance is improving.

*H1b* Investors will invest a higher proportion of their money in a company that integrates its ESG priorities into corporate strategies, and the amount of that additional investment will be greater when the company's financial performance is improving.

However, investors may not perceive the integration of ESG priorities into corporate strategy as being important or meaningful to risk/return analysis. In that case, perceived relevance and reliability should not be related to ESG integration into strategy, but whether or not they have a mediating effect is an interesting empirical question which we also explore.

### 3 | RESEARCH DESIGN

#### 3.1 | Participants

We administered the instrument to Master's of Accountancy students at a large public university near the completion of an intensive accounting and finance module. Participants were randomly allocated to one of four treatment groups and given two and a half hours to read and complete the instrument. Given the typical length of graduate-level courses, the experiment duration was designed to ensure that students did not lose focus. We also offered a drawing for three gift cards of \$50 each to stimulate responsiveness. Incentives play a significant part in motivating survey participation (Hogan & LaForce, 2008), without exerting undue influence on the participants (Singer & Couper, 2008).

Use of students as surrogate for (individual) investors is a controversial issue in behavioral research. The major concern is the significant differences between students and non-students in skills and experience (Birnberg & Nath, 1968), and age and wealth (Ashton & Kramer, 1980). Whether these differences significantly affect responses and thus the external validity of the study has been the research subject of many studies (e.g., Copeland, Francia, & Strawser, 1973; Trotman, 1996).<sup>10</sup> Locke (1986) suggests that experimental realism has a better chance of generalizing the results to other situations, settings, or people than the superficial similarity of representativeness.<sup>11</sup> Many other studies provide support for Locke's conclusion. For example, Liyanarachchi and Milne (2005) examine the adequacy of accounting students as surrogates for their practicing counterparts in an investment decision task related to environmental disclosures by replicating the task used in Milne and Patten (2002). Their results indicate that, in general, students' short-term and long-term investment decisions compare well with practitioners'. Other studies show that graduate business students who have completed their core courses and are enrolled in or have completed

a basic financial statement analysis course are good proxies for reasonably informed non-professional investors (e.g., Cheng et al., 2015; Elliott, Hodge, Kennedy, & Pronk, 2007; Libby, Bloomfield, & Nelson, 2002).

Participants' mean age is 24 (23.16 after winsorizing the two extreme observations – see footnote 21) years, and 42% are female. 20.64 (53.97) percent have above (below) average knowledge in investing in individual stocks and/or bonds. As expected, participants' experience level is low; 11.11 (71.43) percent have above (below) average experience in investing. An examination of the mean, SD, and *t*-statistics on the differences in means, of participants' demographics reveals that participants in group 3 include more male and are younger than those in other groups. The only other significant difference between groups relate to self-assessment of experience. Specifically, group 4 participants assessed their investment experience lower than group 2 participants. The correlation matrix for the variables and demographics indicates no significant correlations, the exception being the high positive correlation between investment knowledge and investment experience. We do not tabulate the demographic data or the correlation matrix for brevity. Nonetheless, we consider these demographics as potential covariates in sensitivity analyses discussed in a later section.

### 3.2 | The experiment

To ensure that confounding factors do not contaminate the results, we employed an experimental approach to testing our hypotheses, presenting financial and sustainability reports in sequence to participants and measuring their responses to different combinations of strategic integration and financial performance.<sup>12</sup> Specifically, we used a 2 × 2 between-subjects design, an overview of which is presented in Appendix 1.<sup>13</sup> Participants were randomly divided into four groups ahead of time. All received industry, company and selected audited financial data of a medical device company (disguised) that provides a positive ESG report,<sup>14</sup> prepared around the Sustainability Accounting Standards Board's materiality map for its industry, and manipulated to show improving or declining financial performance (sales and earnings). They were asked to assess the stock price in the short and long run and to decide what portion of an additional \$1,000 they would be willing to invest in the company, assuming they already owned a perfectly diversified portfolio. In addition, they were allowed to provide comments on their judgments. All information was held constant, except for those elements representing the independent variables of interest. Participants were told to assume a closing stock price as of the day before the release of financial data of \$60 as a benchmark to reduce the chances that they would incorporate factors into their stock price assessments other than those manipulated in our experiment (Hopkins, 1996).

Participants were then provided with the ESG report, manipulated for the ESG priorities to be integrated into the company's strategy or not (the other parts of the ESG report were held constant), and asked to repeat their previous stock price assessments and investment allocation. Again, they were allowed to provide comments on their judgments.

Finally, participants answered several questions relating to their assessments of their knowledge of (familiarity with) ESG and investment, and their understanding of the material they read. Prior research (e.g., Cole et al., 2010) supports the reliability of self-assessed knowledge. The last few questions collected demographic data. These are discussed in detail in the next section.

### 3.3 | Financial and sustainability information

All participants received industry, company and selected audited financial information for an actual medical device company that provides a positive ESG report, prepared around Sustainability Accounting Standards Board's materiality map for its industry. To ensure that prior knowledge of the company did not affect the participants' decisions, we disguised the company's identity, naming it HealthTech.<sup>15</sup> The report first showed highlights (e.g., revenue and earnings per share) for the fourth quarter and full year 2014, followed by a brief management outlook for fiscal year 2015. A narrative providing general information about the company and the industry in which the company operated followed. Next was a comparative graph of the cumulative 5-year total return between HealthTech, the S&P 500 index, and the S&P 500 Health Care Equipment index. Select income statement, balance sheet, cash flow, and other valuation-related variables (e.g., free cash flow) for fiscal years 2010–2014 finished the report. The information provided to groups 3 and 4 (in Appendix 1) was manipulated by essentially switching the data for 2013 and 2014 to show declining sales and earnings (financial performance), and adjusting the narratives accordingly.

The sustainability report related to the same actual company, but was shortened to make sure participants had enough time to read and answer the questions thoroughly. All participants essentially received summary information on the company mission, followed by a message from the Chairman and CEO. A listing of ESG priorities, actions, and performance at HealthTech in Access to Healthcare, Product Safety, Supply Chain, Labor Practices, and Environmental Stewardship followed. Finally, a table provided quantitative performance data in each of the above areas. The summaries of the company mission and the message from the Chairman and CEO were manipulated to highlight whether or not ESG priorities were integrated into the strategy.

Specifically, the summaries for groups 1 and 3 (in Appendix 1) emphasized the operational integration of ESG priorities into the strategy in both the mission statement and the message from the Chairman and CEO. The mission statement included two additional bullets: (a) “To recognize the personal worth of employees by providing an employment framework that allows personal satisfaction in work accomplished, security, advancement opportunity, and means to share in the company's success”; and (b) “To excel in Environmental, Social, and Governance performance as a company”. The Chairman and CEO message stated:

We recognize the utmost importance of strong environmental, social and governance (ESG) performance as part of delivering on these imperatives, and thus have integrated our five ESG pillars into our strategies. These pillars align our actions with the expectations of a wide range of global stakeholders and allow us to monitor critical issues related to access to care, product safety, ethics, human rights, labor practices, supply chain, and the environment.

In contrast, the summaries for groups 2 and 4 emphasized economic performance. The Chairman and CEO message stated:

While our strategies focus on growing our business by delivering outstanding patient care across the globe and generating a fair profit for our shareholders, we also recognize that other stakeholders expect us to demonstrate good citizenship in the communities in which we live and operate, and to society in general. We have thus strived to advance our global environmental, social and governance (ESG) program, which includes access to care, product safety, supply chain, labor practices, and environmental stewardship.

### 3.4 | Independent and dependent variables

Our experiment involved two independent (manipulated) variables. The first was the improving/declining financial performance of the company as measured by sales revenues and earnings (income). The second independent variable was the integration/non-integration of ESG priorities into the corporate strategy.

Ninety-one participants took the survey. We asked three manipulation questions to determine whether participants understood the independent variables as intended. The first question asked: “The company's performance as reflected in growth in sales and income is improving”. The second question asked: “The company's strategies explicitly incorporate ESG priorities and performance”. And, the third question asked: “This year, the company remains ranked in the Top 10% in the industry in terms of the Dow Jones Sustainability World Index and two other indices”. The participants answered each of these questions by checking “true” or “not true”. Sixty-seven participants (74%) answered all three questions correctly. The failure rate for the manipulation questions is comparable to those discussed in prior research (e.g., Brown-Liburd & Zamora, 2015; Kongsved, Basnov, Holm-Christensen, & Hjollund, 2007; Oppenheimer, Meyvis, & Davidenko, 2009; Reimsbach & Hahn, 2015). Following Brown-Liburd and Zamora (2015), we focus our examination on those who correctly identify their cell associations. However, the results are qualitatively the same when we include all participants' responses in the analyses.

A premise underlying our arguments relies on participants' recognizing the positive nature of the report around ESG priorities. In addition, for the ESG report to affect their investment decisions, participants must perceive the report to possess the two primary qualities of accounting information: relevance and reliability. We thus also asked participants to “please rate the ESG activities of the company along the following dimensions: strength of performance, relevance of disclosure, and reliability of disclosure,” using a 7-point Likert scale, with 1 being very low and 7 very high. The overall mean scores across all cells for strength of performance, reliability, and relevance of 5.21, 4.91 and 4.82, respectively, are all significantly higher than the mid-way point of 4.00 ( $p < 0.01$ ). We also find that participants perceived the company's ESG performance to be stronger ( $M = 5.26$  vs. 5.18,  $t = 0.35$ ,  $p = 0.72$ ), more reliable (mean = 4.97 vs. 4.85,  $t = 0.49$ ,  $p = 0.62$ ), but less relevant (mean = 4.74 vs. 4.91,  $t = -0.61$ ,  $p = 0.54$ ), when ESG priorities were integrated into the strategy than when they were not. However, the differences are not statistically significant. Taken together, participants in the sample generally understood the company's strong performance in ESG areas and the reliability and relevance of the ESG information.

Integration of ESG priorities into strategy increased the perceived strength and reliability of the disclosures, suggesting that ESG activities are less likely to be seen as greenwashing when integrated into strategy. However, as discussed in the statistical analysis section below, for the most part the participants' investment decisions are inconsistent with their assessment about the relevance of ESG information and the strength of performance.<sup>16</sup>

In addition, participants were asked to rate their “investment knowledge and experience along the following dimensions: strength of knowledge and strength of experience”, using a 7-points Likert scale, with 1 being very minimal and 7 very significant. They were also asked whether they considered information on “ESG” as relevant to their decisions. Participants

TABLE 1 Descriptive statistics

	Financial performance is improving		Financial performance is declining		Row total	
	<i>n</i>	Mean (SD) # pos./# neg.	<i>n</i>	Mean (SD) # pos./# neg.	<i>n</i>	Mean (SD) # pos./# neg.
Panel A: Percent revisions in short-term stock price assessment						
ESG priorities integrated into strategy	18	-0.76 (2.45) 3/8	16	1.13 (4.18) 11/1	34	1.07 (3.87) 14/9
ESG priorities not integrated into strategy	19	-0.51 (2.27) 4/5	14	2.80 (4.85) 10/1	33	0.89 (3.90) 14/6
Column total	37	-0.64 (2.33) 7/13	30	2.98 (4.43) 21/2	67	0.98 (3.85) 28/15
Panel B: Percent revisions in long-term stock price assessment						
ESG priorities integrated into strategy	18	-1.03 (6.40) 5/5	16	-2.01 (8.13) 4/7	34	-1.49 (7.17) 9/12
ESG priorities not integrated into strategy	19	-4.08 (8.50) 4/9	14	1.50 (16.11) 9/2	33	-1.71 (12.40) 13/11
Column total	37	-2.60 (7.61) 9/14	30	-0.37 (12.40) 13/9	67	-1.60 (10.02) 22/23
Panel C: Percent revisions in investment allocation						
ESG priorities integrated into strategy	18	-3.33 (19.70) 4/7	16	4.38 (20.32) 5/3	34	0.29 (20.07) 9/10
ESG priorities not integrated into strategy	19	-8.95 (23.78) 5/8	14	7.14 (22.68) 9/2	33	-2.12 (24.34) 14/10
Column total	37	-6.22 (21.78) 9/15	30	5.67 (21.12) 14/5	67	-0.90 (22.14) 23/20
Panel D: Perceived relevance of ESG disclosures						
ESG priorities integrated into strategy	18	4.56 (1.38) 9/9	16	4.94 (0.85) 10/6	34	4.74 (1.16) 19/15
ESG priorities not integrated into strategy	19	4.89 (1.20) 13/6	14	4.93 (1.14) 8/6	33	4.91 (1.16) 21/12
Column total	37	4.73 (1.28) 22/15	30	4.93 (0.98) 18/12	67	4.82 (1.15) 40/27
Panel E: Perceived reliability of ESG disclosures						
ESG priorities integrated into strategy	18	5.28 (0.83) 15/3	16	4.63 (0.96) 9/7	34	4.97 (1.09) 24/10
ESG priorities not integrated into strategy	19	4.84 (1.06) 12/7	14	4.86 (0.77) 9/5	33	4.84 (0.94) 21/12
Column total	37	5.05 (1.10) 27/10	30	4.73 (0.87) 18/12	67	4.91 (1.01) 45/22

Notes: “# pos./# neg.” in Panels A-C are the number of respondents in each cell that adjusted their price assessment or investment amount “upward/downward”; In panels D and E, “# > 4/# ≤ 4” are the number of respondents in each cell with perceived relevance and reliability score of “more than/at or below” the midpoint on the Likert scale.

answered this question by checking “true” or “not true”, and in the latter case, by providing the reason: lack of ESG expertise, lack of awareness, skepticism regarding the investment case, or other (which they had to specify). Untabulated results indicate an overall mean score across all cells for strength of knowledge and experience of 3.28 and 2.82, both significantly lower than the midway point of 4.00 ( $p < 0.01$ ). The mean strength of experience is slightly higher when ESG priorities are included in the strategy (mean = 2.88 vs. 2.76,  $t = 0.41$ ,  $p = 0.68$ ), but their strength of knowledge is slightly lower (mean = 3.21 vs. 3.36,  $t = -0.50$ ,  $p = 0.62$ ). Neither difference is statistically significant. Fifty-one (76.1%) considered the ESG information relevant to their decision processes. The reason for not considering ESG information mainly related to lack of ESG expertise ( $n = 10$ ), lack of awareness ( $n = 4$ ), skepticism ( $n = 4$ ), and other ( $n = 3$ ).<sup>17</sup>



There are three dependent variables. The first two variables relate to the participants' short- and long-term stock price assessments, while the third relates to their investment allocation – assuming they already owned a perfectly diversified portfolio, how much of the additional \$1,000 they would invest in the company. We examine both short- and long-term stock price revisions since investors may believe that ESG investments may take a long time to payoff. All three variables are measured as percentage change from the values based on reviewing just financial data to those after reviewing the ESG information because we are interested in the effect of ESG information on investors' decisions. The focus on change controls for each participant's initial assessments/decision based on financial data; that is, it standardizes the magnitude of the change regardless of the initial assessments (Hopkins, 1996).

## 4 | RESULTS

### 4.1 | Descriptive statistics

Table 1 presents descriptive statistics for our main variables of interest. In Panels A, B, and C, we report percentage change (revision) from before to after viewing ESG information in participants' short- and long-term stock price assessments, and investment allocation, respectively. On average, participants expected prices to change by 0.98% and  $-1.60\%$  in the short- and long-term, and invested about \$9 less money in the company. There were some variations across integration of ESG into strategy. When ESG priorities were integrated into strategy, participants expected prices to move slightly higher in the short- and long-term ( $1.07\%$  vs.  $0.89\%$  and  $-1.49\%$  vs.  $-1.71\%$ ), and they invested more of their additional funds in the company (\$2.90 vs.  $-\$20.12$ ). The standard deviation of revision in long-term price assessment and investment amount was also generally lower ( $7.17$  vs.  $12.40$  and  $20.07$  vs.  $24.34$ ). However, fewer respondents expected the price to move higher in the long term and fewer increased their investment amount (9 vs. 13 and 9 vs. 14).

As discussed below, the results somewhat differ across performance trends, suggesting that financial performance may affect the relationship between integration of ESG priorities into strategy and investors' decisions.

### 4.2 | Statistical analysis

Our hypotheses (H1a and H1b) are that investors increase their stock price assessments and the amount of the additional funds they invest in the company's stock when ESG priorities are integrated into corporate strategy than when they are not. That is, we posit that the revisions in stock price assessments and allocation of additional funds for the "strategic integration" groups 1 and 3 will be greater than those for the "non-integration" groups 2 and 4. We also posit that financial performance will lead to stronger investor reactions to the integration of ESG priorities into company strategy. We find that short- and long-term stock price revisions of the participants in the strategic integration groups are slightly, but not significantly, higher than revisions by participants in the non-integration groups (mean =  $1.07$  and  $-1.49$  vs.  $0.89$  and  $-1.71$ ,  $t = 0.19$  and  $0.09$ ,  $p = 0.85$  and  $0.93$ ). The additional funds invested by participants in the strategic integration versus the non-integration groups follow the same pattern and are not significantly different (mean =  $0.29$  vs.  $-2.12$ ,  $t = 0.44$ ,  $p = 0.66$ ).<sup>18</sup>

A more detailed examination of Table 1 reveals that the trend in financial performance somewhat affected investors' decisions. When financial performance was improving, participants revised their expected stock price slightly, but not significantly, lower in the short term when ESG priorities were integrated into strategy (mean =  $-0.76$  vs.  $-0.51$ ). Their revisions of the stock price in the long term and the additional funds they invested, however, were higher (mean =  $-1.03$  and  $-3.33$  vs.  $-4.08$  and  $-8.95$ ) albeit not significantly. For example, they invested \$5.62 more of their additional funds in the company ( $-3.33$  vs.  $-8.95$ ). This finding implies that, when financial performance was improving, participants viewed the company's investments in ESG negatively (perhaps as a drag on profit), especially when they saw the investments as haphazard.

On the other hand, when performance was declining, participants' short-term stock price revisions were slightly but not significantly higher (mean =  $3.13$  vs.  $2.80$ ), and their long-term stock price and investment revisions slightly but again not significantly lower ( $-2.01$  and  $4.38$  vs.  $1.50$  and  $7.14$ ), when ESG priorities were integrated into strategy. One possibility is that participants may have attributed the decline in the financial performance to the ESG investments, and expected the negative effect of haphazard ESG investments to be temporary and that of continued ESG investments permanent.

Overall, the results reported in Table 1 indicate that the integration of ESG priorities into strategy does not have a significant effect on investors' decisions. However, the differential results across performance trend provide initial evidence consistent with the view that financial performance may affect the relationship between integration of ESG priorities into strategy and investors' decisions.

**TABLE 2** ANOVA results (*p*-values are presented as two-tailed)

Source	Predicted Sign	<i>df</i>	SS	MS	<i>F</i> -statistic	<i>p</i> -value
Panel A: Revisions in short-term stock price assessment						
Financial performance (a)	+	1	214.975	214.975	17.75	0.000
ESG priorities integration into strategy (b)	+	1	0.026	0.026	0.00	0.963
(a) * (b)	+	1	1.384	1.384	0.11	0.736
Corrected model		3	217.870	72.623	6.00	.001
Error		63	762.841	12.109		
Panel B: Revisions in long-term stock price assessment						
Financial performance (a)	+	1	87.574	87.574	0.87	0.355
ESG priorities integration into strategy (b)	+	1	0.840	0.840	0.01	0.928
(a) * (b)	+	1	177.828	177.828	1.76	0.189
Corrected model		3	260.230	86.743	0.86	0.467
Error		63	6,362.554	100.992		
Panel C: Revisions in investment allocation						
Financial performance (a)	+	1	2,339.259	2,339.259	4.97	0.029
ESG priorities integration into strategy (b)	+	1	33.458	33.458	0.07	0.791
(a) * (b)	+	1	290.176	290.176	0.62	0.435
Corrected model		3	2,687.857	895.952	1.90	0.138
Error		63	29,658.412	470.768		
Panel D: Perceived relevance of ESG disclosures						
Financial performance (a)	+	1	0.714	0.714	0.52	0.473
ESG priorities integration into strategy (b)	+	1	0.450	0.450	0.33	0.568
(a) * (b)	+	1	0.501	0.501	0.37	0.547
Corrected model		3	1.751	0.584	0.43	0.734
Error		63	86.100	1.367		
Panel E: Perceived reliability of ESG disclosures						
Financial performance (a)	+	1	1.680	1.680	1.66	0.202
ESG priorities integration into strategy (b)	+	1	0.171	0.171	0.17	0.682
(a) * (b)	+	1	1.842	1.842	1.82	0.182
Corrected model		3	3.861	1.287	1.27	0.291
Error		63	63.602	1.010		

Table 2 reports the results of the ANOVA. We conduct a two-way ANOVA to examine the effects of integrating ESG priorities into strategy and financial performance on investors' short- and long-term stock price assessments and investment allocation. As shown in Panels A, B and C of Table 2, the interaction effect of the two variables is not significant at the 5% level. This indicates that the effect of integrating ESG priorities does not depend on the level of financial performance and vice versa. Therefore, the tests for the individual effects are valid, showing no significant effect of ESG integration on the participants' short-term stock price revision, long-term stock price revision and investment allocation ( $F = 0.00, 0.01, \text{ and } 0.07$ ;  $p = 0.96, 0.93, \text{ and } 0.79$ ). Thus, integration of ESG priorities into strategy does not seem to impact investors' decisions, and financial performance does not moderate the relationship. The results do not support our hypotheses.<sup>19</sup>

The sums of squares (SS) reported (type III) in Table 2 measure the differences between predicted ESG priorities integration means over a balanced ESG priorities integration financial performance population – that is, between the LS-means for ESG

priorities integration. A multiple comparison analysis of the ESG priorities integration least square means with Tukey-Kramer adjustment shows that short- and long-term stock price revisions (Panels A and B) and investment amount revision (Panel C) of strategic integration groups 1 and 3 are not different from those of non-integration groups 2 and 4, supporting our conclusion that integration of ESG priorities into strategy does not seem to impact investors' decisions.

When sliced by performance, the interaction effects for revisions in stock prices and investment amount are not significant at the conventional level. The interaction plots (not shown) also indicate that integration of ESG priorities into company strategy does not affect investors' revisions of stock price or investment allocation significantly differently when financial performance is improving than when it is declining (the interaction effects are insignificant:  $F = 0.11, 1.76, \text{ and } 0.62$ ;  $p = 0.74, 0.19, \text{ and } 0.44$ ). Together, these tests provide further support for our conclusion that integration of ESG priorities does not impact investors' decisions, and financial performance does not strengthen the relationship.

Next, we test our hypotheses with a linear contrast in cell means (Buckless & Ravenscroft, 1990). As shown in the first rows of Panels A, B and C in Table 3, integration of ESG priorities into strategy does not result in revisions that are significantly different than when ESG priorities are not integrated into company strategy. That is, improving financial performance groups', that is, groups 1 and 2, revisions are not different from declining financial performance groups', that is, groups 3 and 4 ( $t = 0.05, -0.09, \text{ and } 0.27$ ;  $p = 0.96, 0.93, \text{ and } 0.79$ ).

When financial performance is improving (the second rows of Panels A, B, and C in Table 3), revisions in stock prices by participants in strategic integration group (i.e., group 1) are not significantly different from revisions by participants in the non-integration group (i.e., group 2),  $t = -0.22 \text{ and } 0.92, p = 0.83 \text{ and } 0.36$ . The same holds true for revision in investment amount,  $t = 0.79, p = 0.43$ .

There are also no significant differences in participants' revisions of short- and long-term stock price and investment allocation across strategic integration when financial performance is declining. That is, the revisions by group 3 participants are not significantly greater than those by group 4 participants.

This is consistent with our conjecture that non-results are largely due to investors perceiving the integration of ESG information into corporate strategy as not being important or meaningful to their risk/return analysis. To test our conjecture, we calculate descriptive statistics and develop two additional ANOVA models, using perceived relevance and perceived reliability

**TABLE 3** Comparisons between groups ( $t$ -values are presented as two-tailed)

Group	Parameter	Estimate	SE	$t$ -value	$pr >  t $
Panel A: Comparisons of revisions in short-term stock price assessment					
1&3 versus 2&4	I versus N	0.040	0.856	0.05	0.963
1 versus 2	G*I versus G*N	-0.250	1.145	-0.22	0.828
3 versus 4	P*I versus P*N	0.329	1.273	0.26	0.797
Panel B: Comparisons of revisions in long-term stock price assessment					
1&3 versus 2&4	I versus N	-0.225	2.472	-0.09	0.928
1 versus 2	G*I versus G*N	3.055	3.305	0.92	0.359
3 versus 4	P*I versus P*N	-3.506	3.678	-0.95	0.344
Panel C: Comparisons of revisions in investment allocation					
1&3 versus 2&4	I versus N	1.423	5.338	0.27	0.791
1 versus 2	G*I versus G*N	5.614	7.137	0.79	0.434
3 versus 4	P*I versus P*N	-2.768	7.940	-0.35	0.729
Panel D: Comparisons of perceived relevance of ESG disclosures					
1&3 versus 2&4	I versus N	-0.165	0.288	-0.57	0.563
1 versus 2	G*I versus G*N	-0.339	0.385	-0.88	0.381
3 versus 4	P*I versus P*N	0.009	0.428	0.02	0.983
Panel E: Comparisons of perceived reliability of ESG disclosures					
1&3 versus 2&4	I versus N	0.102	0.247	0.41	0.682
1 versus 2	G*I versus G*N	0.436	0.330	1.32	0.192
3 versus 4	P*I versus P*N	-0.237	0.368	-0.63	0.530

Notes: G = improving financial performance; P = declining financial performance; I = ESG priorities integrated into corporate strategy; N = ESG priorities not integrated into corporate strategy. Groups are defined in Appendix 1.

**TABLE 4** ANOVA results with perceived relevance and reliability (*p*-values are presented as two-tailed)

Source	Predicted Sign	<i>df</i>	SS	MS	<i>F</i> -statistic	<i>p</i> -value
Panel A: Revisions in short-term stock price assessment						
Financial performance (a)	+	1	195.962	195.962	15.85	0.000
ESG priorities integration into strategy (b)	+	1	0.008	0.008	0.00	0.980
(a) * (b)	+	1	2.030	2.030	0.16	0.687
Perceived relevance	+	1	0.199	0.199	0.02	0.900
Perceived reliability	+	1	2.170	2.170	0.18	0.677
Corrected model		5	226.369	45.274	3.66	.001
Error		61	754.352	12.366		
Panel B: Revisions in long-term stock price assessment						
Financial performance (a)	+	1	6.424	6.424	0.07	0.796
ESG priorities integration into strategy (b)	+	1	7.370	7.370	0.08	0.782
(a) * (b)	+	1	337.911	337.911	3.56	0.064
Perceived relevance	+	1	515.641	515.641	5.43	0.023
Perceived reliability	+	1	171.488	171.488	1.80	0.184
Corrected model		5	827.011	165.402	1.74	0.139
Error		61	6,622.784	95.013		
Panel C: Revisions in investment allocation						
Financial performance (a)	+	1	469.441	469.441	1.21	0.275
ESG priorities integration into strategy (b)	+	1	353.662	353.662	0.91	0.343
(a) * (b)	+	1	1,482.074	1,482.074	3.83	0.055
Perceived relevance	+	1	5,992.104	5,992.104	15.50	0.000
Perceived reliability	+	1	2,966.062	2,966.062	7.67	0.007
Corrected model		5	8,757.798	1,751.560	4.53	0.001
Error		61	23,588.471	386.696		

as the dependent variable. The independent variables are the same. The results, reported in Panels D and E of Tables 1 and 2, support our conjecture. Specifically, contrary to our expectation that participants would perceive disclosures about ESG priorities to be significantly more relevant and reliable when ESG priorities are integrated into corporate strategy, participants' responses are not significantly different across ESG strategic integration (mean = 4.74 vs. 4.91 and 4.97 vs. 4.84,  $t = -0.61$  and  $0.49$ ,  $p = 0.50$  and  $0.62$ , for relevance and reliability, respectively). Consistent with the univariate tests, the main effect of ESG integration in the ANOVA models is also not significant ( $F = 0.52$  and  $1.66$ ,  $p = 0.47$  and  $0.20$ , for relevance and reliability respectively). The linear contrasts in cell means reported in Panels D and E of Table 3 also indicate no significant differences in participants' perceptions of relevance and reliability of ESG disclosures across strategic integration.

Next, we develop three models to provide evidence as to whether perceived relevance and reliability of ESG disclosures mediate the effects on stock price assessments and investment allocation of integration of ESG priorities into corporate strategy, financial performance, and their interaction. The models are based on our original ANOVA models expanded to include perceived relevance and perceived reliability as additional independent variables. The results, presented in Table 4, show that perceived relevance significantly affected participants' long-term price assessment ( $F = 5.43$ ,  $p = 0.023$ ), and both perceived relevance and perceived reliability significantly affected participants' investment allocation ( $F = 15.50$  and  $7.67$ ,  $p = 0.000$  and



0.007). This suggests that perceived relevance and reliability mediate the relationship between integration of ESG priorities and investors' long-term price assessment and investment allocation. In particular, higher perceived relevance and reliability of ESG disclosures increases investors' assessment of stock price in the long run and the amount they are willing to invest in the company. The results also show a significant interaction effect between ESG priorities integration and financial performance ( $F = 3.56$  and  $3.83$ ,  $p = 0.064$  and  $0.055$ ), indicating that financial performance has a stronger effect on investors' long-term price assessment and investment allocation when ESG priorities are integrated into corporate strategy after controlling for perceived relevance and reliability.<sup>20</sup> In other words, controlling for relevance and reliability, financial performance has a moderating effect on the relationship between ESG integration and investment decisions.

As a final test, we investigate whether perceptions of relevance and reliability interact with ESG integration and/or performance to affect investors' price assessments and investment allocation. Specifically, we add the interaction of perceived relevance and perceived reliability with ESG integration and performance to the ANOVA model in Table 4. The results, reported in Table 5, show that perceived relevance mediates the relationship between integration of ESG priorities and investors' price assessments and investment allocation ( $F = 2.36$ ,  $2.18$ , and  $3.30$ ;  $p = 0.058$ ,  $0.076$ , and  $0.014$ ). The results also indicate that perceived relevance indeed interacts with performance and ESG integration to affect short-term price assessment decision and investment allocation ( $F = 3.29$  and  $2.48$ ,  $p = 0.048$  and  $0.075$ ). Perceived reliability has a mediating effect on investment allocation ( $F = 4.93$ ,  $p = 0.003$ ) and interacts with ESG integration to affect short-term price decision ( $F = 2.48$ ,  $p = 0.075$ ). The interaction effect between ESG priorities integration and financial performance is significant ( $F = 3.81$  and  $3.83$ ,  $p = 0.058$  and  $0.109$ ), indicating that financial performance has a stronger effect on investors' short-term price assessment and investment allocation when ESG priorities are integrated into corporate strategy after controlling for perceived relevance and reliability. These results confirm our conclusion that future regulatory requirements relating to disclosure of ESG information should aim to improve the perceived relevance and reliability of that information.

### 4.3 | Sensitivity tests

Two sensitivity tests generally confirm our main results. First, we add age and gender as additional independent variables to our ANOVA models. These variables are social group characteristics associated with the likelihood that participants will discern the socially desirable response to the cue (Brown-Liburd & Zamora, 2015). Second, we add two measures of the participants' confidence about their investment judgments – investment knowledge and investment experience – since such confidence level may affect the perceived value relevance of ESG priorities (Coram, Monroe, & Woodliff, 2009).

The untabulated results indicate age is positively associated with participants' revisions in long-term stock price assessment at the 1% significance level.<sup>21</sup> The coefficients for other variables are not significant at the 5% level. The sign and significance of the main variables do not change.

## 5 | SUMMARY AND CONCLUSIONS AND AVENUES FOR FUTURE RESEARCH

Survey research (CFA Institute 2015; IFAC 2012) has shown that investors incorporate ESG information into their investment decisions. Archival and experimental studies on whether and when (i.e., in what circumstances) investors use ESG disclosures have reached different and sometimes contradictory conclusions, but the majority support the decision-making significance of ESG priorities for investors (Campbell & Slack, 2011; Cheng et al., 2015; Deegan & Rankin, 1997; Himick, 2011; Milne & Chan, 1999). In this study, we aim to advance our understanding of when investors use ESG disclosures by examining whether the integration of ESG priorities into corporate strategy impacts investors' pricing and investment allocation. In our examination, we consider the potential moderating effect of financial performance.

To address these questions, we conducted a between-subject  $2 \times 2$  sequential experiment using graduate students in a Master's of Accountancy program as participants. Participants were provided industry, company and selected financial data, manipulated to show improving or declining sales and earnings, for a medical device company (disguised) and were asked to assess the stock price in the short and long run and to decide what portion of their additional funds to invest in the company. Participants were then provided with the ESG information, manipulated for the ESG priorities to be included in the company's strategy or not, and asked to repeat their previous stock price assessments and investment allocation.

We find that integration of material ESG priorities into corporate strategy has no significant effect on investors' price assessments and investment allocation and that financial performance does not strengthen that relationship. Further analysis reveals that perceived relevance and reliability of ESG disclosures have a mediating effect on long-term stock price assessment

**TABLE 5** ANOVA results with the interaction of perceived relevance and reliability with financial performance and ESG integration (*p*-values are presented as two tailed)

Source	Predicted Sign	df	SS	MS	F-statistic	<i>p</i> -value
Panel A: Revisions in short-term stock price assessment						
Financial performance (a)	+	1	12.892	12.892	1.08	0.305
ESG priorities integration into strategy (b)	+	1	1.856	1.856	0.16	0.695
(a) * (b)	+	1	45.490	45.490	3.81	0.058
Perceived relevance (c)	+	5	140.575	28.115	2.36	0.058
Perceived reliability (d)	+	4	45.621	11.405	0.96	0.442
(c) * (b)	+	3	38.941	12.980	1.09	0.365
(d) * (b)	+	2	118.786	59.393	4.98	0.012
(c) * (a)	+	2	78.558	39.279	3.29	0.048
(d) * (a)	+	3	62.193	20.731	1.74	0.175
Corrected model		26	503.441	19.363	1.62	0.082
Error		40	477.270	11.932		
Panel B: Revisions in long-term stock price assessment						
Financial performance (a)	+	1	31.012	31.012	0.31	0.579
ESG priorities integration into strategy (b)	+	1	7.187	7.187	0.07	0.789
(a) * (b)	+	1	230.236	230.236	2.32	0.136
Perceived relevance (c)	+	5	1,081.086	216.217	2.18	0.076
Perceived reliability (d)	+	4	541.055	135.264	1.36	0.264
(c) * (b)	+	3	393.504	131.168	1.32	0.281
(d) * (b)	+	2	12.717	6.358	0.06	0.938
(c) * (a)	+	2	262.277	131.139	1.32	0.278
(d) * (a)	+	3	287.581	95.860	0.97	0.418
Corrected model		26	2,655.307	102.127	1.03	0.458
Error		40	3,967.477	99.187		
Panel C: Revisions in investment allocation						
Financial performance (a)	+	1	11.401	11.401	0.03	0.856
ESG priorities integration into strategy (b)	+	1	674.767	674.767	1.98	0.168
(a) * (b)	+	1	918.565	918.565	2.69	0.109
Perceived relevance (c)	+	5	5,628.345	1,125.669	3.30	0.014
Perceived reliability (d)	+	4	6,729.603	1,682.401	4.93	0.003
(c) * (b)	+	3	2,538.598	846.199	2.48	0.075
(d) * (b)	+	2	331.292	165.646	0.48	0.619
(c) * (a)	+	2	1,303.679	651.840	1.91	0.162
(d) * (a)	+	3	882.022	294.007	0.86	0.469
Corrected model		26	18,684.733	718.644	2.10	0.017
Error		40	13,661.536	341.538		

and investment allocation, and that financial performance has a stronger effect on investors' long-term price assessment and investment allocation when ESG priorities are integrated into corporate strategy. However, integration of ESG priorities and financial performance do affect investors' decisions via perceived relevance and reliability. In addition, perceived relevance and reliability interact with financial performance and ESG integration, respectively, to affect stock price assessment in the

short run; and, perceived relevance interacts with ESG integration to affect investment allocation. This is important because ultimately it is the investors' perceptions of the relevance and reliability of ESG disclosures that drive investment decisions.

Our study adds to the findings of prior studies on when ESG disclosure is informative. Furthermore, it reveals many research opportunities. For example, it would be interesting to explore whether ESG disclosures impact investors' cash flow expectations, the firm's cost of capital, or both (potentially offsetting and resulting in no overall effect). In addition, conducting the experiment with the MTurk platform, which has been used by social science research, including research in financial economics (e.g., Kumar, Niessen-Ruenzi, & Spalt, 2015; Kuziemko, Norton, Saez, & Stantcheva, 2015), might allow research to side-step many of the issues related to using only students as participants. Future research could also investigate which other moderating and/or mediating variables impact the relationship between ESG disclosures and investors' decisions.

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## ENDNOTES

- <sup>1</sup> In 2016, 82% of S&P 500 companies published ESG reports, up from only 20% in 2011 (GAI 2017).
- <sup>2</sup> The interpretive release provided guidance to public companies about how to handle climate change matters under Regulation S-K requirements for descriptions of a company's business, disclosure of legal proceedings and risk factors, and management's discussion and analysis of the company's financial condition and results of operations (Securities and Exchange Commission, 2010).
- <sup>3</sup> Dodd-Frank requires disclosure relating to public companies' use of so-called "conflict minerals," payments made by resource extraction issuers to foreign governments, and health and safety violations at mining-related facilities.
- <sup>4</sup> The SEC has received a substantial number of comment letters in response to the Concept Release. Notably, the Sustainability Accounting Standards Board (SASB) wrote in support of more robust standards for sustainability disclosure (SASB 2016).
- <sup>5</sup> We chose this company because it prepares its ESG report around Sustainability Accounting Standards Board's (SASB) materiality map for its industry. SASB's mission is to develop and disseminate sustainability accounting standards that help public corporations disclose material, decision-useful information to investors ([www.sasb.org](http://www.sasb.org)).
- <sup>6</sup> The underlying assumption is that investors are savvy and able to distinguish material ESG priorities. Such priorities are relevant to a company's strategy and operations and may lead to major innovations in products, processes, and business models.
- <sup>7</sup> Alan Beller, "Making Sustainability Reporting Work for Investors and Companies," NASDAQ Listing Center Outside Insight (July 27, 2016).
- <sup>8</sup> This would be consistent with Renneboog, Ter Horst, and Zhang's (2008) observation that socially responsible investments (SRI) in continental Europe and Asia-Pacific have continued to register strong growth in spite of their underperformance relative to other investments. It is also possible that, regardless of their perceptions about the relationship between ESG investments and a company's financial performance, investors may be willing to pay a premium for stocks of socially responsible companies in order to support their personal values related to social responsibility (Martin & Moser, 2016; Renneboog et al., 2008).
- <sup>9</sup> Although we expect that stock price assessment and investment amount decisions will be consistent, providing corroborating information, it is possible that the two investor responses will diverge when a company discloses strategic integration of ESG initiative. Investors may invest additional funds into a company that discloses strategic integration of ESG priorities even if they believe that the stock price will drop due, for example, to support social justice goals.
- <sup>10</sup> Another issue in the context of our study is that students may have a higher reception for ESG information than other investors (Dunlap, Van Liere, Mertig, & Jones, 2000). If that is true, then we should observe even more of an effect on their investment decision.
- <sup>11</sup> Experimental realism in our experiment was high because: (a) the instrument involved a low level of integrative complexity, (b) it was given to the students in their intensive accounting and finance module, where they routinely valued companies and made short-term and long-term investment decisions, and (c) 1 week prior to the administration of the instrument, the professor spoke to the participants about the importance of the research study and encouraged them to be honest and realistic in their evaluations. We thus expect our results to be generalizable.
- <sup>12</sup> Sequential design may cause an issue because the participants' first price assessments/allocation form anchors for any subsequent assessments/allocation responses. This can confound the results. We used sequential design because our objective is to measure the effect of ESG disclosures on investors' stock price assessments and investment allocation, and so we wanted to make sure that participants did not go back and revise their answers based on financial information after reviewing the ESG disclosures. We take comfort in our approach since, investigating a similar research question, Brown-Liburd and Zamora (2015) find sequential design of their experiment did not limit the generalizability of their results.

- <sup>13</sup> Our instrument is modeled after Brown-Liburd and Zamora (2015) and Reimsbach and Hahn (2015). We thank Professor Reimsbach for sharing their instrument with us.
- <sup>14</sup> We used a positive ESG report since ESG reports are typically positive (Holder-Webb, Cohen, Nath, & Wood, 2009).
- <sup>15</sup> The name “HealthTech” may have led the participants to determine that a firm operating in this industry is not a substantial contributor to environmental and social problems. Subsequently, the ESG disclosure could have been given limited weight in the financial decision process. A follow-up study comparing a firm with a name like “HealthTech” to a firm with a name like “FrackingTech” would be interesting.
- <sup>16</sup> This result was surprising. We expected participants to perceive ESG disclosures as more relevant when ESG priorities are included in strategy. This phenomenon is not limited to non-professional investors. Bailey et al. (2016) question institutional investors’ commitment or their ability to convert their commitment into practice. They argue that although many large institutional investors have publicly committed themselves to integrating ESG factors into their investing, less than 1% of the total capital of the 15 largest U.S. public pension funds is allocated to ESG-specific strategies (Bailey et al., 2016, 1). Nevertheless, it is possible that the results in the ANOVA analysis in Table 2, Panel A-C, are driven by unsuccessful implementation rather than the participants’ disregard for the information on ESG integration into strategy when forming their decisions.
- <sup>17</sup> Two of three in the “other” category explained they only cared about financial results; the third implied the same by stating he was “unsure of ESG’s relationship with the company performance”.
- <sup>18</sup> Wilcoxon z-tests also show no significant differences across strategic integration in revisions in stock price or the investment amount.
- <sup>19</sup> We also conducted a non-parametric analysis. Specifically, we performed a two-way ANOVA based on ranked data. The results are consistent with those of the parametric analysis in that integration of ESG priorities into strategy does not impact investors’ stock price assessments and investment decision, and financial performance does not moderate the relationship.
- <sup>20</sup> We also regress our original dependent variables (revisions in stock price assessments and investment decision) on the same expanded set of independent variables. For this analysis, we recode perceived relevance and reliability to 1 for values that are equal to or greater than median, and zero for those below median. The other two independent variables, improving/declining financial performance and integration/non-integration of ESG priorities in the corporate strategy, are also recoded as 1 and zero. The results of the regression models are qualitatively the same as the expanded ANOVA models, except the interaction effect between ESG priorities integration and financial performance in the long-term price revision model is significant at the 5% level. The results confirm the mediating effect of perceived relevance and reliability in the relationship between integration of ESG priorities and investors’ long-term price assessment and investment decision.
- <sup>21</sup> Two participants were older, 37 and 51. Capping age at 28, the next highest age, makes age insignificant.

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## APPENDIX 1

### Experimental design

	Positive (improving) financial performance	Negative (declining) financial performance
ESG integrated into strategy	Group 1	Group 3
ESG not integrated into strategy	Group 2	Group 4