



6-24-2020

## Board Gender Diversity, ESG, and Corporate Performance

Novena Sutiono

Western Michigan University, novenakresentia@gmail.com

Follow this and additional works at: [https://scholarworks.wmich.edu/honors\\_theses](https://scholarworks.wmich.edu/honors_theses)



Part of the Finance and Financial Management Commons

---

### Recommended Citation

Sutiono, Novena, "Board Gender Diversity, ESG, and Corporate Performance" (2020). *Honors Theses*. 3321.

[https://scholarworks.wmich.edu/honors\\_theses/3321](https://scholarworks.wmich.edu/honors_theses/3321)

This Honors Thesis-Open Access is brought to you for free and open access by the Lee Honors College at ScholarWorks at WMU. It has been accepted for inclusion in Honors Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact [wmu-scholarworks@wmich.edu](mailto:wmu-scholarworks@wmich.edu).



**Board Gender Diversity, ESG and Corporate Performance**

Novena K. Sutiono

Lee Honors College, Western Michigan University

Honors Thesis

Dr. Timothy Palmer

Dr. Jagjit Saini

Dr. Jim DeMello

Jun. 24, 2020

## **Board Gender Diversity, ESG and Corporate Performance**

### **Introduction**

Investing in sustainability is key for a firm's long-term performance. Firms need to be able to address the interests of multiple stakeholders and their impact on society. Through sustainability management, firms benefit by engaging with various stakeholders, creating value for more than just the shareholders. Sustainability management involves embracing the economic and the environmental, social and governance (ESG) factors and examining its impact. In the field of finance, scholars and practitioners alike are especially attuned to sustainability's ESG factors and the importance of managing ESG to ensure firm short term and long-term success. Indeed, empirical research has established a positive relationship between ESG factors and firm performance.

Given the importance of ESG on firm success, scholars are increasingly investigating factors that influence decisions about ESG. Examples include the size of the firm, the industry it operates in and certain governance characteristics. One especially important governance characteristic is the composition of the board and the level of diversity. Departing from traditional homogenous boards and increasing the diversity within the board can highly benefit firms. Diversity brings in different expertise and perspectives that can potentially elevate the decision-making process, which is needed in an increasingly multicultural society. The thinking is that more diverse boards will consider varying points of view when making critical decisions which will reduce the firm's exposure to environmental and social risks.

One key indicator of board diversity is gender diversity. Women currently are highly underrepresented in the boardroom, holding only 22.5% of board seats within Fortune 500 companies. This is unfortunate because board gender diversity could highly benefit the firm as

women bring unique characteristics with them to the boardroom. They influence the board's advisory and monitoring role through improving governance and increasing the heterogeneity through their different knowledge, values and experiences. Increased gender diversity allows them to better address the many different interests of multiple stakeholders. Researchers have sought to study the relationship between board gender diversity and firm performance but, despite its intuitive appeal, results are ambiguous. Some studies lend support for the thesis that board gender diversity enhances performance. Others have found just the opposite. One explanation for disparate results is that the influence of board gender diversity is complex such that the effect of board gender diversity on performance is realized through important organizational decisions and strategies. For example, it could be that board gender diversity influences a firm's ESG factors, which in turn influence performance. The logic is that increased board gender diversity allows the board to better address the interest of all stakeholders, which is done through sustainability management. This can eventually lead to better firm performance. Research has not yet investigated these effects, however. This thesis attempts to fill that research gap by studying the relationship between board gender diversity and ESG performance. The conceptual model underlying this thesis is presented in Figure 1.

Figure 1  
Conceptual Model



The rest of the thesis is structured as follows. Section 2 discusses the literature review and presents the research hypothesis. Section 3 reviews the research design, including the sample

selection, the methodology and the variables used. Section 4 presents the results. Finally, section 5 discusses the results, including considerations for practitioners and future research.

## **Literature review and hypothesis development**

### ***Investing in sustainability***

Firm performance depends on how firms strategize and how they operate in both market and non-market environments (Orlitzky et al., 2003). According to stakeholder theory, because businesses are ingrained within society, they have, up to a certain level, the duty to better the welfare of society. They are not only responsible to shareholders, but their actions also impact multiple stakeholders (Galbreath, 2016). Freeman (1984) defines stakeholders as “any group or individual who can affect or is affected by the achievement of the organization’s objectives” (p. 46). In general, stakeholders include shareholders, employees, communities, the environment, suppliers and governments (Galbreath, 2016). Business practices that do not consider the values and requirements of society can be detrimental in the long run, therefore businesses need to be able to reconcile the multiple interests of different stakeholder groups. A key tool to achieve effective stakeholder communication is sustainable management activities (Velte, 2016).

Corporate sustainability is strategic management business practice intended to build resilience among firms by fulfilling the interests of present and future stakeholders. Businesses not only have to focus on delivering outcomes in the short run, but they must also preserve the human and natural resources they need to continue to perform well in the future (Artiach et al., 2010).

There is a strong business case as to why firms should invest in sustainability. First, the firm can gain a competitive advantage through engaging with stakeholders. Departing from the traditional business model of aiming to create value for just shareholders, sustainable businesses

aim to create value for all stakeholders. It is important to continually address all stakeholders so the firm can be better informed and positioned to handle economic, regulatory, social and environmental changes and avoid conflicts that are detrimental to creating value (Whelan & Fink, 2017).

Second, sustainable businesses can improve their management of risk. Firms should invest today in building capacity for the long term and in developing adaptive strategies to manage multiple forms of social and environmental risks. Those risks manifest in many dimensions out of the firm's control over the long term, for example climate change, water scarcity and poor labor conditions (Whelan & Fink, 2017). Indeed, Kumar et al. (2016) demonstrated in their study that firms with high ESG performance are less risky than their peer industry group. They studied 12 industry groups, and the results showed that the group of firms with high ESG performance exhibited lower stock return volatility (on average 28.67% less) compared to the rest of the companies in the same industry.

Third, investing in sustainability fosters innovation. Firms are exposed to many new business opportunities when they encourage innovation that meets environmental standards and social needs. Firms also need to recognize that there is a growing interest from consumers in sustainable products; innovation driven by sustainability can aid them in solving these consumer challenges (Whelan & Fink, 2017).

Fourth, sustainable firms increasingly gain the loyalty of customers. Customers nowadays expect firms to be transparent and honest, and they seek more and more products from businesses that have integrity, are socially responsible, and are sustainable to the core (Whelan & Fink, 2017). McKinsey research found that sustainability can drive consumer preference, as customers are willing to pay to be more sustainable. They found that more than 70% of

consumers are willing to pay an extra 5% for a sustainable product if it performs as well as a non-sustainable alternative (Koller et al., 2019).

Last, sustainable firms can better attract and engage employees. Firms that have sustainability at their core can attract quality employees by sharing with them a sense of higher purpose. Research has also found a positive correlation between positive social impact and higher job satisfaction. Employee motivation increases when they feel a sense of purpose, ultimately increasing productivity. In addition, studies have shown that there is a positive relationship between employee satisfaction and shareholder returns (Koller et al., 2019).

In sum, scholars are increasingly finding the positive impacts of sustainability initiatives within firms. Because it focuses on enhancing value to all stakeholders, sustainability helps ensure short term and long-term success.

### ***Relationship between ESG and corporate performance***

Corporate sustainability performance considers “the extent to which a firm embraces economic, environmental, social and governance factors into its operations, and ultimately the impact they exert on the firm and society” (Artiach et al., 2010, p. 32). This concept is especially attractive to the financial industry, so, not surprisingly, sustainable investing has been gaining popularity and traction. Morgan Stanley’s Institute for Sustainable Investing defines sustainable investing as “the practice of investing in companies or funds that aim to achieve market rate financial returns while pursuing positive social and/or environmental impact” (Morgan Stanley, 2019, p. 3). More than 85% of individual investors are interested in sustainable investing and more fund managers are incorporating environmental, social, and governance (ESG) criteria in their investment process (Morgan Stanley, 2019; Hale, 2019).

There has been increasing research interest focused on the relationship of ESG factors and firm performance, dating back to the 1970s (Friede et al., 2015). ESG factors are measures of a firm's management of risk, the competence of management, and non-financial performance. ESG factors take into consideration issues such as the environment (e.g. climate change, energy and water use, carbon emissions), social responsibility (e.g. fair-trade principles, human rights, product safety, gender equality, health and safety) and corporate governance (e.g. board independence, corruption bribery, reporting and disclosure, shareholder protection (Galbreath, 2012). Friede, Busch and Bassen meta-analyzed results of many previous academic research papers and, based on the aggregated results of 2,200 individual studies, they detected strong empirical evidence for the business case for ESG investing. 90% of the studies they examined found a non-negative relationship (i.e., either a positive impact or no impact) between ESG and corporate performance, with a large portion of the studies finding a positive relationship.

### ***Factors that affect ESG***

Because a firm's ESG overall performance has the potential to positively affect its performance, it is important to consider what factors influence ESG. That is, why do some firms evidence low ESG performance (i.e., high risk) while others demonstrate high ESG performance (i.e., low risk). Past research has investigated some influential variables. First, firm size. Firms that are larger draw more attention from more stakeholders, the government and the public. "Larger firms are more likely to create correspondingly larger social problems because of the sheer scale and prominence of their activities. For example, pollution emissions to some extent will be a function of the size of operations" (Artiach et al., 2010, p. 36). This will likely influence how the firm strategically responds to the demands of multiple stakeholders, as larger firms face more scrutiny from the public and face more external pressures. Firms that are larger



are also more likely to realize the advantage of scale economies from sustainable activities (Artiach et al., 2010).

Second, the firm's leverage might affect a firm's ESG performance because it indicates how important financial stakeholders are relative to other stakeholders. The firm's creditors are a powerful stakeholder group because they supply capital to the firm. With higher leverage, management might prioritize addressing the concerns of debtholders over other stakeholders, causing the firm to have a more short-term view in its operations and investments (Artiach et al., 2010; Haque, 2017). Firms with higher leverage might have less free cash flows and financial resources as they must devote those resources to service their debt, which can lead to a decline in ESG initiatives like climate related activism (Haque, 2017).

The same applies to firms with high growth, as they are more likely to be scrutinized by external finance providers, like creditors, so they might put more pressure on management to reduce investments towards sustainability (Kyaw et al., 2017). Hence, those firms are more likely to exhibit poor ESG performance.

Fourth, the profitability of a firm is likely to influence the investments it decides to take on. When the firm is profitable, there is less pressure from its financial stakeholders, hence the firm has more capacity and freedom to invest in programs towards sustainability, such as battling climate change or focusing on employee engagement. Being profitable allows the firm to still meet shareholder expectations, while also allowing them to meet the demands of other stakeholders through sustainable investments. If the firm is not profitable, management faces pressure to maximize returns to financial stakeholders and reduce costs (Artiach et al., 2010).

Fifth, studies have shown a positive impact from the representation of independent directors, as there is evidence showing that independent directors are more likely to advocate socially responsible behavior (Villiers et al., 2011).

Sixth, firms in different industries experience different effects from ESG factors. High ESG performance affects different industries on varying levels, the strongest impact being on the materials, banking, energy and technology industry. For example, the difference in volatility between the ESG and reference companies in the food and beverage industry is 6.10%. On the other hand, the difference in volatility within the energy industry is 50.75%. ESG performance also affects each industry in varying degrees. There is a drastic difference in volatility between industries for average performing companies. For example, the difference in volatilities between energy (most volatile) and insurance (least volatile) is 47%. But for the group of high ESG performing companies, the volatility of those industries become much more similar, with a difference of only 11% (Kumar et al., 2016).

Various industries face different levels of exposure to environmental and social risk, which would in turn affect their ESG performance as well. For example, the oil and gas sector has been identified as the sector most exposed to those risks, since it is by nature “exposed to GHG emission, pollution from well head and transport spills and leaks, and water use and contamination risks” (Wilkins et al., 2019, p. 14). On the other hand, the asset management sector faces relatively low exposure to environmental and social risks. As a service provider, its use of physical infrastructure and facilities is limited, thus producing low levels of GHG emissions and pollution. The social risks they are exposed to from human capital management is also relatively low as they typically employ a small and skilled workforce (Wilkins et al., 2019).

### ***How diversity affects ESG***

The level of diversity within a company can also affect ESG. Firms benefit from being heterogeneous as people with various experiences, skills and knowledge bring multiple perspectives to the table. “Attitudes, cognitive functioning, and beliefs are not randomly distributed in the population, but tend to vary systematically with demographic variables such as age, race and gender,” (Robinson & Dechant, 1997, p. 27). Greater diversity can improve the firm’s understanding of the marketplace. In an increasingly diverse market, firms can match the diversity of the company to the market and gain a better understanding of the interest of multiple stakeholder groups through representation. Firms can then appropriately respond to stakeholder interests in their ESG initiatives. Greater diversity also encourages creativity and innovation from the presence of various perspectives. Innovation exposes firms to more opportunities for solutions that better address ESG factors.

Firms embracing diversity can also produce higher quality problem-solving (Robinson & Dechant, 1997). Having a heterogeneous group with varying backgrounds lets them see problems from different perspectives and have a wider discussion of possible solutions and consequences of each, including ESG initiatives. With various perspectives represented, firms can take into better consideration ESG solutions that will address stakeholder needs.

### ***Diversity within the board of directors***

Just like diversity can benefit the company and improve its ESG performance, the same can be true for the impact of board of director diversity on ESG. Traditionally, boards are groups of people who come from similar socioeconomic backgrounds, have similar education and professional training, and therefore have similar perspectives on business practices (Westphal & Milton, 2000). The importance of board diversity draws upon the fact that our current society is more multicultural and gender sensitive. Economies now demand from companies “sophisticated

talent with global acumen, multi-cultural fluency, technological literacy, entrepreneurial skills, and the ability to manage increasingly delayed, disaggregated organizations” (Chambers et al., 1998, para. 7). Boards are recognizing the benefit of diversity and thinking about how they can depart from uniformity and determine whether they have diverse perspectives that are required to make today’s business decisions. “Diverse boards help to better represent all shareholders, nurture better appreciation of “intangibles” like work/life issues and can help recruit and retain top executive women and minorities” (Biggins, 1999, p. 2). In contrast, a less diverse board could potentially cause a lack of critical thinking and innovation (Walt & Ingley, 2003). Diversity within the board could prevent premature decision-making because they introduce new, different perspectives to the discussion (Pletzer et al., 2015). This could reduce the risk potential of the firm, hence improving ESG performance.

Diversity in corporate governance is defined as the composition of the board and the mix of different attributes, expertise and characteristics that each board member has and how it affects decision making and the board process. Characteristics that make up board diversity include age, gender, ethnicity, culture, religion, constituency representation, independence, professional background, knowledge, technical skills and expertise, commercial and industry experience, career and life experience (Walt & Ingley, 2003).

### ***Previous research on board gender diversity***

Gender diversity within the board of directors is particularly interesting. As of 2018, women held 22.5% of board seats among Fortune 500 companies. The number of board seats held by women has continued to increase over the past years (compared to just 15.7% in 2004), however women are still highly underrepresented (Catalyst, 2019).

A number of previous studies have examined the relationship between board gender diversity and firm performance however, results are mixed. Campbell and Mínguez Vera sampled companies from Spain and found a positive effect on firm value (as measured by Tobin's Q) from board gender diversity. They suggested that firms should not just focus on simply having women directors, because just their inclusion along will not affect firm value. Firms should instead focus on the balance between women and men on the board, which they showed increased firm value (Campbell & Mínguez-Vera, 2007).

Carter, Simkins and Simpson studied Fortune 1000 firms and also found a positive relationship between board diversity and Tobin's Q. Their results showed that the percentage of female and minority directors increased as firm size increased, but the percentage decreased if the percentage of insiders increased (Carter et al., 2003).

Erhardt, Werbel and Shrader sampled U.S. firms and found that board diversity is positively associated with firm financial performance indicators, namely ROA and ROI, because increased diversity is associated with increased effectiveness of the board's oversight function. They argued that although conflict emerges with a diverse group of people, it improves oversight because conflict allows them to consider a wider range of solutions (Erhardt et al., 2003).

Research, however, has not always detected a positive impact of board gender diversity on firm performance. For example, Adams and Ferreira (2019) found that board gender diversity had, on average, a negative effect on firm performance. They argue that studies that found a positive relationship are not robust to their methods of addressing the endogeneity of gender diversity, and that the true relationship is actually much more complex. They found that increased diversity positively impacts firm performance in firms that have weak governance but employing gender quotas could actually hurt firm value in firms that have strong governance

(potentially due to excessive monitoring) They finally concluded that there is no support for quota-based policy initiatives because there is no evidence that it would positively impact firm performance on average (Adams & Ferreira, 2009).

Shrader, Blackburn and Iles sampled 200 U.S. firms and found a negative relationship between board gender diversity and various measure of financial performance such as ROS, ROA, ROE and ROI. They offered several potential explanations for these results. First, female directors experience a disadvantage as they are typically assigned to board committees that do not significantly impact the firm. Their second explanation is that the number of women on any particular board has not reached a “critical mass” so there is not much of an impact, considering the fact that on average there is only one female per board in their study (Shrader et al., 1997).

Mínguez-Vera and Martin found a negative relationship between board gender diversity and ROE based on their studies of Spanish SMEs. They do not find support that adding women to boards improves performance. They actually found that the risk-aversion of women instead negatively impact firm performance. Female directors on Spanish SMEs have a larger capacity for decision-making, which could lead to the adoption of less risky strategies and in turn negatively affect performance (Mínguez-Vera & Martin, 2011).

Two meta-analyses sought to combine the body of research examining relations between board gender diversity and firm performance. Both reported similar results. Post and Byron found that although there is a positive relationship between female board representation and accounting returns, there is a near zero relationship with market performance (Post & Byron, 2015). Pletzer, Nikolova, Kedzior and Voelpel’s meta-analysis, despite having a much smaller sample size (20 studies compared to 140 studies in Post and Byron’s), found a small positive, non-significant relationship between percentage of female directors and firm performance. They

noted that the relationship between board gender diversity and firm performance is complex such that examining direct links between board gender diversity and firm performance might be less fruitful than exploring impacts of board gender diversity on intervening variables that subsequently influence firm performance. That is, these authors concluded that there are numerous variables that could be mediating or moderating relations between board gender diversity and performance (Pletzer et al., 2015).

### ***How board gender diversity affects ESG***

Building on previous research and, in particular, suggestions that board gender diversity possibly affects decisions and outcomes that the board has more direct control over than overall firm performance (Post & Byron, 2015), this thesis investigates the indirect effects of board gender diversity on firm performance through ESG performance. ESG is a tool to engage and build relationships with stakeholders by improving the ethical, environmental, and social standards of the firm's operations. Collectively, these decisions can eventually lead to improved corporate performance (Galbreath, 2016). Therefore, board gender diversity can positively influence the firm's corporate performance through its impact on the firm's ESG initiatives that engages with and reconciles the multiple interests of stakeholders.

Gender diversity within the board is particularly interesting because of the board's role in leading the company to success. The board is responsible for planning and executing strategic goals and creating company culture (Birindelli et al., 2018). There are two main functions for the board of directors: monitoring and advising. The monitoring role involves overseeing management, guaranteeing financial transparency and becoming a fiduciary for its shareholders' or the "watchdog." The advising role involves giving guidance to the CEO and establishing strategy (Crifo & Roudaut, 2018).

Adams and Ferreira (2009) found that greater gender diversity on boards results in more participation in strategic decision-making and tougher CEO monitoring. Their study found that female directors have better attendance, and that their presence improves the attendance of male directors. Female directors are also more likely to be assigned to monitoring-related committees, such as auditing, nominating and corporate governance. As an indication that female directors are tougher monitors, they found that CEO turnover is more sensitive to stock performance in more gender diverse boards. There is also more alignment with shareholders' interests as the proportion of female directors is associated with more equity-based compensation. These scholars do warn that too much board monitoring can have a negative effect instead, as too much interference could break down communications between directors and managers, and ultimately negatively affect performance (Adams & Ferreira, 2009).

Female directors bring important characteristics to the boardroom. For example, female directors typically hold more advanced degrees than male directors and are less likely to come from business backgrounds (e.g. community service organizations and academia). They also report having more diverse interests outside of work and more interest in philanthropy and community service. These differences in experience and worldviews expands the body of knowledge that the board can take advantage of in their decision-making process (Post & Byron, 2015). Female leaders have exhibited risk-aversion, less radical decision-making, and a tendency towards more sustainable investment strategies. They also lead in a more transformational way compared to male leaders, showing more support and encouragement towards their colleagues. Women directors were also found to hold their responsibilities as directors in higher regard, which is associated with more effective corporate governance (Pletzer et al., 2015). Women uphold certain values such as interdependence, benevolence and tolerance which helps draw out



information and perspectives and aid in collaboration and discussion between board members (Post & Byron, 2015). They also facilitate decision-making with a cooperative and democratic approach and utilize participative communication and process orientation, which results in fair decisions when meeting the needs and expectations of multiple stakeholders (Post & Byron, 2015; Birindelli et al., 2018).

Kim and Starks (2016) studied how female directors contribute to firm performance through the board's advisory role and found that they increased the advisory effectiveness through providing unique skills to the board. Advisory effectiveness is measured by the heterogeneity in functional expertise, and an increase in effectiveness has been linked to higher firm value. They found that the addition of female directors provided more unique skills previously lacking within the board compared to the addition of male directors. This suggests that the increased heterogeneity in expertise brought on by new female directors increases the board's effectiveness. It follows that such gender heterogeneity leads to higher quality advice relative to boards evidencing less gender heterogeneity. It is also interesting to note that often missing expertise within the board, namely H.R., Risk Management, Sustainability, and Political/Government, are more likely to be possessed by female rather than male directors (Kim & Starks, 2016).

In sum, board gender diversity increases the heterogeneity of the board, as female directors bring differences in knowledge, values and experiences. It is also associated with better corporate governance through increased advisory effectiveness and tougher monitoring. Higher levels of heterogeneity and better governance allow the board of directors to better consider multiple stakeholder interests when considering sustainability strategies. I expect that more

effective decision making will result in improved ESG performance, which in turn leads to better overall firm performance. Stated formally:

H1: Board gender diversity is positively associated with ESG performance.

H2: Corporate performance of the firm is positively associated with ESG performance.

H3: The association between corporate performance and ESG performance is moderated by the effect of board gender diversity.

## **Sample and data**

### *Sample selection*

The population of firms was comprised of the 1000 companies listed on the 2015 Fortune 1000 list. I chose the period of 2015-2016 because it had the most current data available on Compustat, my primary data source. From those 1000 firms, I deleted firms with the SIC code between 6000 and 6999 because they operate in the financial industry. This was done because financial firms have a different structure in that they own primarily soft assets rather than hard assets. Next, I removed firms that were involved in merger and acquisition activities in 2016 (i.e. if the Compustat annual item “AQC” is not equal to zero or blank). Eliminating these firms was important because the financial statements of those firms will be out of proportion due to restructuring, hence becoming outliers. Finally, I deleted firms that had missing financial or ESG data. The final sample consisted of 169 firms.

### *Variables*

Table 1 provides a summary of all the variables used in the study.

**Dependent variable** ESG data is taken from TruValue Labs’ Insight Score for the 2016 fiscal year. TruValue uses natural language processing (NLP) and artificial intelligence (AI) to continuously gather and interpret data from reports by various sources such as analysts,

government regulators, media and advocacy groups. This provides an “outside-in” view of a company, distinguishing TruValue Labs from other data sources that typically provide an “inside-out” view, as it relies on company self-disclosure and is time-lagged (Malinak et al., 2018).

TruValue Labs applies 26 different topics as defined by the Sustainability Accounting Standards Board (SASB), including Environment, Social Capital, Human Capital, Business Model & Innovation, and Leadership & Governance. They utilize the criteria established within ESG frameworks, apply it to the reports and aggregate it into relevant ESG data for the companies and sectors they cover. The ESG data is scored using a scale from 0 to 100. A neutral impact is scored 50, while positive performance is scored above 50 and negative performance is scored below 50 (Malinak et al., 2018).

The TruValue Insight Score provides a measure for a company’s long term ESG performance. It is derived from the Pulse Score, which measures short term ESG performance. The Pulse Score reflects the day to day sentiment of a company on a specific topic or ESG category based on documents published that day, which allows real-time monitoring of companies. The Insight Score is an exponentially weighted moving average of the Pulse score, with a six month’s half-life for the influence of an event on the score (Malinak et al., 2018). I use the Insight Score for the year of 2015 to account for a lagged effect (1-year lag).

I measure corporate performance through both operational performance and market performance. Accordingly, operational performance is measured by an accounting-based measure (ROA), while market performance is measured by a market-based measure (Tobin’s Q). ROA is the net income divided by total assets, while Tobin’s Q is the market enterprise value

divided by the total asset replacement value. Financial data were acquired from Compustat and measured for the year of 2016.

***Independent Variables*** The independent variable used in the model, *B\_DIV*, measures the percentage of women within a board of directors. It is the number of female directors divided by the total board size at the end of the 2015 fiscal year. I use this as a proxy for board gender diversity. Data for this variable were acquired from Bloomberg. In cases where Bloomberg did not report board gender diversity, data were acquired from firms' yearly proxy statements.

***Control Variables*** I control for several variables that previous research has indicated influences ESG performance. Unless otherwise indicated, data were acquired from Compustat. First, I control for firm size. Larger firms have more resources and are more likely to realize economies of scale through ESG initiatives. Second, leverage. A firm that is more highly leveraged might prioritize debtholders over other stakeholders, thus engaging in less ESG. Third, growth. A high-growth company is more likely to be scrutinized by creditors and hence pressured to invest less in sustainability. Fourth, loss. A profitable firm has more capacity to invest in sustainability. I coded loss as 1 if the firm experienced a loss for the 2015 fiscal year, 0 otherwise. Fifth, the representation of independent directors has been shown to positively influence ESG as well. Data for board independence were acquired from Bloomberg. Finally, industry. Firms operating in different industries have different pressures to invest in sustainability, as well as different benefits. I accounted for the difference in industries by the first 2 digits of the SIC code for each firm.

## **Methodology and results**

### ***Regression model***

I use linear regression analyses to test out hypotheses. The first hypothesis studies whether board gender diversity has a positive influence on ESG performance. ESG performance (*ESG*) is the dependent variable and board gender diversity (*B\_DIV*) is the independent variable. The following model is estimated:

$$\begin{aligned}
 ESG_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t \\
 & + \beta_5 B\_IND_{t-1} + \beta_6 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{1}$$

Where,  $ESG_t$  is the ESG score for the current period (2016);  $B\_DIV_{t-1}$  is the percentage of female directors for the previous period (2015);  $SIZE$ ,  $LEVERAGE$ ,  $GROWTH$ ,  $LOSS$  and  $B\_IND$  represent the control variables, all measured for 2016 except  $B\_IND$  (measured for 2015).

I expect the sign of  $SIZE$  to be positive, while the signs of  $LEVERAGE$ ,  $GROWTH$ , and  $LOSS$  to be negative. The expected sign of  $B\_IND$  is also positive.

The second hypothesis tests whether corporate performance is positively associated with ESG performance. I estimated two different models for each corporate performance measure, Tobin's Q (market-based) and ROA (accounting-based). The following models apply:

$$\begin{aligned}
 TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{2}$$

$$\begin{aligned}
 ROA_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{3}$$

where  $TOBINQ_t$  and  $ROA_t$  are measures of corporate performance, measured for the current period (2016). The other variables are the same as defined in Model (1). I expect the sign of  $ESG$  to be positive, as better ESG performance is associated with better corporate performance.

To test the third hypothesis, I included interaction variables between  $ESG$  and both  $B\_DIV$  and  $B\_IND$  to test whether board gender diversity moderates the association between  $ESG$  and corporate performance. The following models are estimated:

$$\begin{aligned}
 TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \beta_8 ESG \times B\_IND + \beta_9 ESG \times B\_DIV \\
 & + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{4}$$

$$\begin{aligned}
 ROA_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \beta_8 ESG \times B\_IND + \beta_9 ESG \times B\_DIV \\
 & + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{5}$$

where  $ESG \times B\_DIV$  is the interaction term between ESG and board gender diversity ( $B\_DIV$ ).  $ESG \times B\_IND$  is the interaction term between ESG and board independence ( $B\_IND$ ). The other variables are the same as defined in Models (1), (2), and (3).

### ***Descriptive statistics***

Table 2 provides an overview of the descriptive statistics. The average asset size of sampled firms is \$22.7bn. In general, the sample firms are profitable, with an average net income of \$853.7mn and a median of \$297.8mn. The mean level of leverage of the firms, as measured by the ratio of total liabilities to total assets, is 0.6433, with a median of 0.6523. On average, the

market to book ratio of the sample firms is 6.0728. For the performance indicators, the average ROA is 3.53% and the average Tobin's Q is 1.8703.

The average ESG score is 60.67. A score of 50 indicates neutral impact, so the average score means that the sample firms in general have a positive ESG impact. The board size, on average, is 10.4 members, with the largest board having 17 directors and smallest having 5 directors. On average, there are 1.8 women serving on the board of directors. The most gender diverse board in the sample had five females. The average board gender diversity, as measured by percentage of female directors in the board, is only 16.44%. The most gender diverse board had 50% female directors and the least gender diverse board had no females. On average, 81.94% of the directors on the board are independent (i.e. not employed by the company), with a standard deviation of 11.62%.

### ***Correlation results***

Table 3 provides the Pearson correlation matrix for all variables. *ESG* is 19.72% negatively correlated with *SIZE* at the  $p=.05$  significance level, and 25.58% negatively correlated with *ROA* at the .01 significance. Board gender diversity (*B\_DIV*) is positively correlated with *SIZE* (21.33%) and *LEVERAGE* (17.83%) at the 1 percent and 5 percent significance respectively. Board independence is 29.57% positively correlated with board gender diversity at the 1 percent significance. I do not find a significant correlation between *ESG* and both board independence and board gender diversity. *TOBINQ* and *ROA* are correlated by 48.45% at the 1 percent significance.

### ***Regression results***

Table 4 provides the results for model 1 (H1). Board gender diversity has no significant impact on ESG performance (0.0561,  $p$ -value = 0.9957). Therefore, there is no support for a

positive effect of board gender diversity on the firm's ESG performance, rejecting H1.

Regarding the control variables, *SIZE* had a significant negative association with ESG performance (-3.8138, p-value = 0.0328). Contrary to expectations, *LEVERAGE* has positive modestly significant association with ESG performance (11.3698, p-value = 0.0694).

Table 5 provides results relevant to the influences on market performance (Tobin's Q) associated with models 2 (H2) and 4 (H3). Board gender diversity approaches significant association with Tobin's Q (0.7494, p-value = 0.093) when I do not control for industry. When the interaction variables are included, *B\_DIV* is no longer significantly associated with firm performance (2.0476, p-value = 0.3379). In models where the industry dummies are included, *B\_IND* has a negative association with *TOBINQ*, significant at 10% (-0.8224, p-value = 0.0696). Additionally, there is no significant relationship between *B\_DIV* and *TOBINQ* in the models with the industry dummies. In all models, *ESG* is not significantly associated with *TOBINQ* at all. Overall, I do not find support for H2 and H3 for market performance.

Table 6 provides results relevant to the influences on accounting-based performance (ROA) associated with models 3 (H2) and 5 (H3). I find a significant positive relationship between board gender diversity and *ROA* (0.0936, p-value = 0.0491). There is also a positive association between *ESG* and *ROA* albeit with a very small coefficient (0.0009, p-value = 0.0654). These relationships lose significance in models where I do not control for industries. Hence, there is weak and mixed evidence in support of H2. In models with the interaction variable between *ESG* and *B\_DIV*, there is no significant relationship between the dependent variable (*ROA*) and each of *ESG* (0.0013, p-value = 0.4255), *B\_DIV* (0.0631, p-value = 0.8159) and *ESG*×*B\_DIV* (0.0006, p-value = 0.8918). This implies that the association between *ESG* and



*ROA* is not moderated by board gender diversity. Therefore, I do not find support for H3 for *ROA*, the operational performance measure.

## **Discussion**

Based on the regression results, I do not find a significant relationship between board gender diversity and ESG performance, therefore rejecting the first hypothesis. There is mixed evidence in support of the second hypothesis, with results showing no association between ESG and Tobin's Q and very weak evidence supporting a positive relationship between ESG and ROA. Finally, there is no support for the third hypothesis regarding the moderation of the relationship between ESG and corporate performance by board gender diversity, as I do not find significance in the relationship between the interaction variables and the dependent variables.

There are several possible reasons that could explain why I did not find an effect of board gender diversity on ESG performance. One possible reason relates to the board's function. The board's main function to monitor managerial behavior and to provide advice to the CEO, not to make operational or strategic decisions. CEOs and the top management team are the decision makers in the firm, so instead it could be that they are the ones that have more of a say in deciding what ESG initiatives the firm should undertake. It would be an interesting question for future research to study the effect of female CEOs on ESG performance instead of the board characteristics.

Another explanation for the lack of significance could be addressed by including an additional control variable. Future research could consider controlling for the existence of a sustainability committee within the board of directors. To have directors who have specific education or prior experience with sustainability would directly increase heterogeneity of skills within the board. Having a dedicated board committee towards sustainability could also explain

how a firm could be more focused towards their ESG performance. The existence of a sustainability committee could be positively linked towards ESG performance and firm performance, so it would be interesting to control for that aspect in future research.

Most of these firms also had not reached the critical mass of three female directors on the board, hence explaining the lack of impact on both ESG performance and corporate performance. On average the firms included in this study only had 2 female directors on the board. Konrad and Kramer (2006) argue that three or more women are needed to “achieve the ‘critical mass’ that can cause a fundamental change in the boardroom and enhance corporate governance” (p. 19). Having only one woman on the board has been associated with tokenism, with previous female directors who served solo reporting being both visible and invisible, being stereotyped and seen as a representation of all women. Only after having three or more women on the board is the presence of women normalized, and the female directors feel more comfortable speaking out on issues that raise their concern and be less worried about being associated with other women. Although this paper did not focus heavily on studying the effect of the critical mass, this could be an improvement to be implemented in future research.

Another potential explanation from a measurement issue is that the time lag used in this study was too short. I only accounted for a one-year time lag for the effect of board gender diversity (using 2015 board data against 2016 ESG performance). It could be that board decisions associated with firms’ ESG initiatives take a much longer time for their influences to be felt and subsequently be reflected in a firm’s ESG scores. Future research could implement longer time lags (e.g., three or five years) to more appropriately account for the effect of board gender diversity on ESG performance.

I could not find strong support for the positive relationship between ESG and corporate performance, and it could be that ESG had an impact on strategic decision making instead of directly on corporate performance. Management might look at their firm's low ESG score and use it to reflect on their current strategies. Their low current ESG performance could make them take the initiative to implement a different ESG strategy in order to become more sustainable and improve their ESG performance in the future. Research could instead look at the impact of ESG scores of strategic decision making, which would in turn impact the overall performance of the firm.

No study is without its limitations. I restricted the sample to only U.S. firms. Firms operate within the context of society and culture, so it would be interesting for future research to explore the international context. I can consider how country-specific culture could impact the relationship with both ESG and firm performance. Cultural context could moderate the extent to which women can have an impact on the board and bring fundamental change. I could replicate the study and choose firms from a different country, or another approach would be to include firms from worldwide and control for country.

### **Follow-up Study**

The previous sections discussed results from the models proposed in my thesis. In reviewing results, I questioned whether the model could be improved in substantive ways. One area that drew my attention was associated with my two performance indicators. I previously saw that ROA and Tobin's Q are highly correlated by 48.45% ( $p=.01$ ). The level of operational performance could determine how the market perceives corporate performance to be. Therefore, in this post-hoc analysis, ROA was added as a control variable to the Tobin's Q model. I re-estimated the following equations to test H2 and H3:

$$\begin{aligned}
TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
& + \beta_6 ROA_t + \beta_7 B\_IND_{t-1} + \beta_8 B\_DIV_{t-1} + \text{Industry dummies include} + \varepsilon_t
\end{aligned}
\tag{6}$$

$$\begin{aligned}
TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
& + \beta_6 ROA_t + \beta_7 B\_IND_{t-1} + \beta_8 B\_DIV_{t-1} + \beta_9 ESG \times B\_IND \\
& + \beta_{10} ESG \times B\_DIV + \text{Industry dummies included} + \varepsilon_t
\end{aligned}
\tag{7}$$

where  $ROA_t$  is the firm's return on assets (operational performance measure) for the current period (2016) and the other variables are the same as defined earlier.

Table 7 provides the results for Models (6) and (7). Board gender diversity ( $B\_DIV$ ) is not significantly associated with market performance. Board independence ( $B\_IND$ ) is negatively associated with Tobin's Q in both models. There is no significant association between  $ESG$  and Tobin's Q, which is consistent with previous results. The interaction variables are also not significantly associated with Tobin's Q. The added control variable,  $ROA$ , is as expected positively associated with Tobin's Q, significant at 5% in both models. This implies that better operational performance does positively affect the market perception of the firm, therefore resulting in better market performance. But overall, there is no support for H2 and H3 based on these results.

## Conclusion

It's important for firms to engage with their many stakeholders and manage the multiple, often conflicting, interests between them. Having more women on the board could allow the board to better consider multiple stakeholder interests, as women increase the heterogeneity of a board's skills, its collective knowledge and experience, and could, generally, improve the level

of governance. This result is improved ESG performance, which could lead to better overall corporate performance.

Despite the intuitive appeal of board gender diversity, I did not find support that higher gender diversity within the board of directors leads to better ESG performance. There is also mixed evidence in support of a positive relationship between ESG performance and corporate performance. There is a positive association with operational performance, but no support for market performance. In addition, I found no support that there is a moderation of the relationship between ESG performance and corporate performance by board gender diversity. From this, I conclude that board gender diversity, in itself, does not directly lead to better ESG performance and corporate performance. There are many factors to account for in this highly complex relationship, so further research is needed to analyze and determine how board gender diversity ultimately affects both ESG and corporate performance.

## References

- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2), 291–309.  
<https://doi.org/10.1016/j.jfineco.2008.10.007>
- Artiach, T., Lee, D., Nelson, D., & Walker, J. (2010). The determinants of corporate sustainability performance. *Accounting & Finance*, *50*(1), 31–51.  
<https://doi.org/10.1111/j.1467-629x.2009.00315.x>
- Birindelli, G., Dell’Atti, S., Iannuzzi, A., & Savioli, M. (2018). Composition and Activity of the Board of Directors: Impact on ESG Performance in the Banking System. *Sustainability*, *10*(12), 4699. <https://doi.org/10.3390/su10124699>
- Biggins, J. V. (1999). Making board diversity work. *Corporate board*, *20*(117), 11-16.
- Campbell, K., & Mínguez-Vera, A. (2007). Gender Diversity in the Boardroom and Firm Financial Performance. *Journal of Business Ethics*, *83*(3), 435–451.  
<https://doi.org/10.1007/s10551-007-9630-y>
- Carter, D. A., Simkins, B. J., & Simpson, W. G. (2003). Corporate Governance, Board Diversity, and Firm Value. *The Financial Review*, *38*(1), 33–53. <https://doi.org/10.1111/1540-6288.00034>
- Catalyst. (2019, January 16). *Report: Missing Pieces: The 2018 Board Diversity Census of Women and Minorities on Fortune 500 Boards*. Catalyst.

<https://www.catalyst.org/research/missing-pieces-report-the-2018-board-diversity-census-of-women-and-minorities-on-fortune-500-boards/>.

Chambers, E. G., Foulon, M., Handfield-Jones, H., Hankin, S. M., & Michaels, E. G. (1998).

The war for talent. *McKinsey Quarterly*, 44-57.

Crifo, P., & Roudaut, G. (2018). *Board independence and the monitoring-advising trade-off in France* (No. hal-01741708).

Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of Director Diversity and Firm Financial Performance. *Corporate Governance*, 11(2), 102–111.

<https://doi.org/10.1111/1467-8683.00011>

Freeman, R. E. (1984). *Strategic Management: a Stakeholder Approach*. Pitman.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233. <https://doi.org/10.1080/20430795.2015.1118917>

Galbreath, J. (2012). ESG in Focus: The Australian Evidence. *Journal of Business Ethics*, 118(3), 529–541. <https://doi.org/10.1007/s10551-012-1607-9>

Galbreath, J. (2016). Is Board Gender Diversity Linked to Financial Performance? The Mediating Mechanism of CSR. *Business & Society*, 57(5), 863–889.

<https://doi.org/10.1177/0007650316647967>

Hale, J. (2019, February). Sustainable Funds U.S. Landscape Report. Retrieved June 24, 2020.

- Haque, F. (2017). The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms. *The British Accounting Review*, 49(3), 347–364. <https://doi.org/10.1016/j.bar.2017.01.001>
- Kim, D., & Starks, L. T. (2016). Gender Diversity on Corporate Boards: Do Women Contribute Unique Skills? *American Economic Review*, 106(5), 267–271. <https://doi.org/10.1257/aer.p20161032>
- Koller, T., Nuttall, R., & Henisz, W. (2019). Five ways that ESG creates value. *The McKinsey Quarterly*.
- Kramer, V. W., Konrad, A. M., Erkut, S., & Hooper, M. J. (2006). *Critical mass on corporate boards: Why three or more women enhance governance* (pp. 2-4). Wellesley, MA: Wellesley Centers for Women.
- Kumar, N. C. A., Smith, C., Badis, L., Wang, N., Ambrosy, P., & Tavares, R. (2016). ESG factors and risk-adjusted performance: a new quantitative model. *Journal of Sustainable Finance & Investment*, 6(4), 292–300. <https://doi.org/10.1080/20430795.2016.1234909>
- Kyaw, K., Olugbode, M., & Petracci, B. (2017). Can board gender diversity promote corporate social performance? *Corporate Governance: The International Journal of Business in Society*, 17(5), 789–802. <https://doi.org/10.1108/cg-09-2016-0183>
- Malinak, S., Du, J., & Bala, G. (2018). *Performance tests of Insight, ESG momentum, and volume signals* [White paper]. TruValue Labs. [https://www.truvaluelabs.com/wp-content/uploads/2018/05/WP\\_PerfTest\\_R1k.pdf](https://www.truvaluelabs.com/wp-content/uploads/2018/05/WP_PerfTest_R1k.pdf)



- Morgan Stanley. (2019). *Sustainable Signals: Individual Investor Interest Driven by Impact, Conviction and Choice*. Morgan Stanley's Institute for Sustainable Investing. [https://www.morganstanley.com/pub/content/dam/msdotcom/infographics/sustainable-investing/Sustainable\\_Signals\\_Individual\\_Investor\\_White\\_Paper\\_Final.pdf](https://www.morganstanley.com/pub/content/dam/msdotcom/infographics/sustainable-investing/Sustainable_Signals_Individual_Investor_White_Paper_Final.pdf).
- Mínguez-Vera, A., & Martin, A. (2011). Gender and management on Spanish SMEs: an empirical analysis. *The International Journal of Human Resource Management*, 22(14), 2852–2873. <https://doi.org/10.1080/09585192.2011.599948>
- Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate Social and Financial Performance: A Meta-Analysis. *Organization Studies*, 24(3), 403–441. <https://doi.org/10.1177/0170840603024003910>
- Pletzer, J. L., Nikolova, R., Kedzior, K. K., & Voelpel, S. C. (2015). Does Gender Matter? Female Representation on Corporate Boards and Firm Financial Performance - A Meta-Analysis. *PLoS ONE*, 10(6), e0130005. <https://doi.org/10.1371/journal.pone.0130005>
- Post, C., & Byron, K. (2015). Women on Boards and Firm Financial Performance: A Meta-Analysis. *Academy of Management Journal*, 58(5), 1546–1571. <https://doi.org/10.5465/amj.2013.0319>
- Robinson, G., & Dechant, K. (1997). Building a business case for diversity. *Academy of Management Perspectives*, 11(3), 21–31. <https://doi.org/10.5465/ame.1997.9709231661>
- Shrader, C. B., Blackburn, V. B., & Iles, P. (1997). Women in management and firm financial performance: An exploratory study. *Journal of Managerial Issues*, 355-372.

- Velte, P. (2016). Women on management board and ESG performance. *Journal of Global Responsibility*, 7(1), 98–109. <https://doi.org/10.1108/jgr-01-2016-0001>
- Villiers, C. D., Naiker, V., & Staden, C. J. V. (2011). The Effect of Board Characteristics on Firm Environmental Performance. *Journal of Management*, 37(6), 1636–1663. <https://doi.org/10.1177/0149206311411506>
- Walt, N., & Ingley, C. (2003). Board Dynamics and the Influence of Professional Background, Gender and Ethnic Diversity of Directors. *Corporate Governance*, 11(3), 218–234. <https://doi.org/10.1111/1467-8683.00320>
- Westphal, J. D., & Milton, L. P. (2000). How Experience and Network Ties Affect the Influence of Demographic Minorities on Corporate Boards. *Administrative Science Quarterly*, 45(2), 366–398. <https://doi.org/10.2307/2667075>
- Whelan, T., & Fink, C. (2017, June 01). The Comprehensive Business Case for Sustainability. Retrieved June 24, 2020, from <https://hbr.org/2016/10/the-comprehensive-business-case-for-sustainability>
- White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*, 48(4), 817. <https://doi.org/10.2307/1912934>
- Wilkins, M., Burks, B., Charbon, R. C., Bastit, B., Cochelin, P., & Volland, E. F. (2019, May 13). The ESG Risk Atlas: Sector And Regional Rationales And Scores. <https://www.spglobal.com/en/research-insights/articles/the-esg-risk-atlas-sector-and-regional-rationales-and-scores>.

## Appendix

Figure 1: Conceptual Model



Table 1: Variables

<i>Variable</i>	<i>Explanation</i>
AT	is the total assets (in millions) at the end of the fiscal year 2016
B_DIV	is the number of female directors divided by the total board size at the end of the fiscal year 2015; where board gender diversity is Bloomberg Terminal item “% of Women on Board”
B_IND	is the number of independent directors divided by the total board size at the end of the fiscal year 2015, where board independence is Bloomberg Terminal item “% of Independent Directors”
ESG	is the TruValue Insight score at the end of the fiscal year 2016.
GROWTH	is the natural log of the ratio of market to book value of equity at the end of the fiscal year 2016, i.e., = $\log(\text{MKT2BOOK})$
Industry Dummies	is the first 2 digits of the Standard Industrial Classification (SIC) code
LEVERAGE	is the ratio of liabilities to assets at the end of the fiscal year 2016, i.e., = $\text{Compustat annual items “LT”} \div \text{“AT”}$
LT	is the total liabilities (in millions) at the end of the fiscal year 2016
LOSS	=1 if the firm’s net income (Compustat annual item “NI”) in 2015 is negative; otherwise = 0

MKT2BOOK	is the ratio of market to book value of equity at the end of the fiscal year 2016, i.e., = Compustat annual items “CSHO” x “PRCC_F” ÷ “BKVLP5”
NI	is the net income (in millions) at the end of the fiscal year 2016
ROA	is the net income divided by total assets at the end of the fiscal year 2016; i.e. = Compustat annual items “NI” ÷ “AT”
SALE	is the total sales (in millions) at the end of the fiscal year 2016
SIZE	is the natural logarithm of total assets at the end of the fiscal year 2016, i.e., =log(Compustat annual item “AT”)
TOBINQ	is the market enterprise value divided by the total asset replacement value at the end of the fiscal year 2016; i.e. = Compustat annual items (“AT” + “CSHO” x “PRCC_F” – “CEQ”) ÷ “AT”

**TABLE 2: Descriptive Statistics**

Variables <sup>a</sup>	N	Mean	Median	Minimum	Maximum	Std. Dev
<i>AT</i>	169	22738.91	9435.66	246.8720	330314	39800.08
<i>SIZE</i>	169	3.9889	3.9748	2.3925	5.5189	0.5669
<i>LT</i>	169	15405.68	5474.00	95.5600	208668	27263.26
<i>NI</i>	169	853.6620	297.8	-6177	14239	2397.88
<i>SALE</i>	169	14605.45	6527.80	693	197518	29283.09
<i>ROA</i>	169	0.0353	0.0358	-0.3735	0.3194	0.0876
<i>TOBINQ</i>	169	1.8703	1.5354	0.8975	5.3658	0.9494
<i>MKT2BOOK</i>	169	6.0728	2.5938	0.1300	175.0714	15.3580
<i>GROWTH</i>	169	0.5058	0.4139	-0.8861	2.2432	0.4011
<i>LEVERAGE</i>	169	0.6433	0.6523	0.1093	0.9784	0.1740
<i>ESG</i>	169	60.6656	62.3164	29.6732	86.6664	11.8785
<i>B_DIV</i>	169	0.1644	0.1667	0	0.5	0.0911
<i>B_IND</i>	169	0.8194	0.8571	0.4286	0.9142	0.1162
<i>BOARDSIZE</i>	169	10.46	11	5	17	2.10
<i>WOMENONBOARD</i>	169	1.76	2	0	5	1.07

Notes: <sup>a</sup>See Table 1 for variable definitions

TABLE 3: Correlations

	<i>AT</i>	<i>SIZE</i>	<i>LT</i>	<i>NI</i>	<i>SALE</i>	<i>ROA</i>	<i>TOBINQ</i>	<i>MKT2BOOK</i>	<i>GROWTH</i>	<i>LEVERAGE</i>	<i>ESG</i>	<i>B_DIV</i>	<i>B_IND</i>
<i>AT</i>	1.0000	0.7240 ***	0.9619 ***	0.5310 ***	0.8498 ***	0.0149	-0.0930	-0.0503	-0.0629	0.1128	-0.1972 **	0.2133 ***	0.1713 **
<i>SIZE</i>		1.0000	0.7230 ***	0.4501 ***	0.5765 ***	0.0127	-0.1310	-0.0732	-0.0374	0.2091 ***	-0.1930 **	0.2213 ***	0.2833 ***
<i>LT</i>			1.0000	0.5286 ***	0.8331 ***	0.0142	-0.0956	-0.0281	-0.0316	0.2160 ***	-0.1648 **	0.2416 ***	0.1585 **
<i>NI</i>				1.0000	0.5223 ***	0.5500 ***	0.1946 **	0.0393	0.1759 **	0.0672	-0.0443	0.1872 **	0.1368 *
<i>SALE</i>					1.0000	0.0699	0.0134	-0.0073	0.0134	0.1066	-0.1437 *	0.1909 **	0.1190
<i>ROA</i>						1.0000	0.4845 ***	0.1598 **	0.3468 ***	-0.1360 *	0.2558 ***	0.0938	0.0987
<i>TOBINQ</i>							1.0000	0.3840 ***	0.7015 ***	-0.0890	0.0215	0.1046	0.0171
<i>MKT2BOOK</i>								1.0000	0.6708 ***	0.3108 ***	0.0426	0.1330 *	0.0664
<i>GROWTH</i>									1.0000	0.3763 ***	0.0768	0.1445 *	0.1046
<i>LEVERAGE</i>										1.0000	0.0767	0.1783 **	0.1201
<i>ESG</i>											1.0000	0.0613	0.0143
<i>B_DIV</i>												1.0000	0.2957 ***
<i>B_IND</i>													1.0000

Notes: \*, \*\*, and \*\*\* indicate significant correlations at 10%, 5% and 1% level of significance respectively

**TABLE 4: Regression results**  
**Dependent variable: ESG**

Variable	Coefficient (p-value) <sup>a</sup>	Coefficient (p-value) <sup>a</sup>	Coefficient (p-value) <sup>a</sup>	Coefficient (p-value) <sup>a</sup>	Coefficient (p-value) <sup>a</sup>	Coefficient (p-value) <sup>a</sup>
<i>Intercept</i>	74.8534*** (<.0001)	78.0123*** (<.0001)	75.7486*** (<.0001)	66.6574*** (<.0001)	70.2516*** (<.0001)	66.6606*** (<.0001)
<i>SIZE</i>	-5.5777*** (0.0001)	-5.5626*** (<.0001)	-5.7531*** (<.0001)	-3.8132** (0.0356)	-3.7161** (0.0354)	-3.8138** (0.0328)
<i>LEVERAGE</i>	11.6093** (0.0236)	11.2223** (0.0282)	11.2171** (0.0271)	11.3737* (0.0676)	11.3214* (0.0732)	11.3698* (0.0694)
<i>GROWTH</i>	-3.2752 (0.1379)	-3.3287 (0.1264)	-3.4147 (0.1200)	-1.7040 (0.4875)	-1.5428 (0.5146)	-1.7045 (0.4870)
<i>LOSS</i>	-12.1127*** (<.0001)	-12.0393*** (<.0001)	-12.0192*** (<.0001)	-9.8608*** (0.0031)	-10.1218*** (0.0029)	-9.8590*** (0.0034)
<i>B_IND</i>	5.4560 (0.5583)	-	3.9788 (0.6731)	4.2491 (0.6700)	-	4.2427 (0.6754)
<i>B_DIV</i>	-	9.2087 (0.3127)	8.0348 (0.3723)	-	0.8170 (0.9360)	0.0561 (0.9957)
<i>Industry dummies</i>	-	-	-	Included	Included	Included
<i># of Observations</i>	169	169	169	169	169	169
<i>Adjusted R-square (%)</i>	17.29%	17.50%	17.12%	23.84%	23.71%	23.21%

**Notes:**

$$\begin{aligned}
 ESG_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t \\
 & + \beta_5 B\_IND_{t-1} + \beta_6 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{1}$$

<sup>a</sup> p-values are based on White's (1980) heteroscedasticity consistent variance covariance matrix.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively.

**TABLE 5: Regression results**  
**Dependent variable: TOBINQ**

Variable	Coefficient (2) (p-value) <sup>a</sup>	Coefficient (4) (p-value) <sup>a</sup>	Coefficient (2) (p-value) <sup>a</sup>	Coefficient (4) (p-value) <sup>a</sup>
<i>Intercept</i>	2.7311*** (<.0001)	3.7787*** (0.0040)	3.1553*** (0.0002)	4.7349*** (0.0003)
<i>SIZE</i>	-0.0432 (0.5670)	-0.0405 (0.5909)	0.0636 (0.4750)	0.0720 (0.4310)
<i>LEVERAGE</i>	-2.2237*** (<.0001)	-2.2604*** (<.0001)	-2.4588*** (<.0001)	-2.4966*** (<.0001)
<i>GROWTH</i>	1.9984*** (<.0001)	1.9986*** (<.0001)	2.1884*** (<.0001)	2.1842*** (<.0001)
<i>LOSS</i>	-0.0462 (0.6495)	-0.0491 (0.6322)	-0.0250 (0.8797)	-0.0324 (0.8447)
<i>ESG</i>	-0.0022 (0.5608)	-0.0201 (0.3105)	0.0018 (0.6284)	-0.0255 (0.1860)
<i>B_IND</i>	-0.3042 (0.3361)	-1.8486 (0.2285)	-0.8224* (0.0696)	-2.7296* (0.0615)
<i>B_DIV</i>	0.7494* (0.0930)	2.0476 (0.3379)	0.5670 (0.2514)	0.1638 (0.9392)
<i>ESG×B_IND</i>	-	0.0265 (0.2813)	-	0.0335 (0.1580)
<i>ESG×B_DIV</i>	-	-0.0218 (0.5014)	-	0.0058 (0.8771)
<i>Industry dummies</i>	-	-	Included	Included
<i># of Observations</i>	169	169	169	169
<i>Adjusted R-square (%)</i>	62.73%	62.44%	67.72%	67.50%

**Notes:**

$$TOBINQ_t = \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t \quad (2)$$

$$TOBINQ_t = \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \beta_8 ESG \times B\_IND + \beta_9 ESG \times B\_DIV + \text{Industry dummies included} + \varepsilon_t \quad (4)$$

<sup>a</sup> p-values are based on White's (1980) heteroscedasticity consistent variance covariance matrix.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively.



**TABLE 6: Regression results****Dependent variable: ROA**

Variable	Coefficient (3) (p-value) <sup>a</sup>	Coefficient (5) (p-value) <sup>a</sup>	Coefficient (3) (p-value) <sup>a</sup>	Coefficient (5) (p-value) <sup>a</sup>
<i>Intercept</i>	0.0454 (0.3350)	0.1278 (0.2218)	0.0618 (0.3268)	0.0366 (0.7543)
<i>SIZE</i>	0.0057 (0.4846)	0.0057 (0.4806)	0.0195** (0.0479)	0.0196** (0.0453)
<i>LEVERAGE</i>	-0.1256*** (0.0001)	-0.1288*** (0.0001)	-0.1745*** ( $<.0001$ )	-0.1739*** ( $<.0001$ )
<i>GROWTH</i>	0.0571*** (0.0003)	0.0571*** (0.0003)	0.0672*** ( $<.0001$ )	0.0672*** ( $<.0001$ )
<i>LOSS</i>	-1.413*** ( $<.0001$ )	-0.1418*** ( $<.0001$ )	-0.1098*** ( $<.0001$ )	-0.1093*** ( $<.0001$ )
<i>ESG</i>	0.0003 (0.5074)	-0.0011 (0.4643)	0.0009* (0.0654)	0.0013 (0.4255)
<i>B_IND</i>	0.0309 (0.3137)	-0.1005 (0.4354)	-0.0011 (0.9713)	0.0347 (0.8117)
<i>B_DIV</i>	0.0194 (0.6324)	0.1845 (0.4198)	0.0936** (0.0491)	0.0631 (0.8159)
<i>ESG</i> × <i>B_IND</i>	-	0.0023 (0.2794)	-	-0.0006 (0.7948)
<i>ESG</i> × <i>B_DIV</i>	-	-0.0028 (0.4255)	-	0.0006 (0.8918)
<i>Industry dummies</i>	-	-	Included	Included
<i># of Observations</i>	169	169	169	169
<i>Adjusted R-square (%)</i>	57.26%	56.90%	65.94%	65.37%

**Notes:**

$$ROA_t = \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \text{Industry dummies included} + \varepsilon_t \quad (3)$$

$$ROA_t = \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t + \beta_6 B\_IND_{t-1} + \beta_7 B\_DIV_{t-1} + \beta_8 ESG \times B\_IND + \beta_9 ESG \times B\_DIV + \text{Industry dummies included} + \varepsilon_t \quad (5)$$

<sup>a</sup> p-values are based on White's (1980) heteroscedasticity consistent variance covariance matrix.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively.

**TABLE 7: Regression results**  
**Dependent variable: TOBINQ**

Variable	Coefficient (6) (p-value) <sup>a</sup>	Coefficient (7) (p-value) <sup>a</sup>
<i>Intercept</i>	3.02306*** (0.0002)	4.65589*** (0.0002)
<i>SIZE</i>	0.02175 (0.8080)	0.02977 (0.7441)
<i>LEVERAGE</i>	-2.08513*** (<.0001)	-2.12153*** (<.0001)
<i>GROWTH</i>	2.04440*** (<.0001)	2.03924*** (<.0001)
<i>LOSS</i>	0.21002 (0.2902)	0.20341 (0.3012)
<i>ESG</i>	-0.00007298 (0.9840)	-0.02838 (0.1304)
<i>ROA</i>	2.14141** (0.0381)	2.15706** (0.0374)
<i>B_IND</i>	-0.81994* (0.0563)	-2.80437** (0.0398)
<i>B_DIV</i>	0.36076 (0.4350)	0.02766 (0.9901)
<i>ESG×B_IND</i>	-	0.03486 (0.1205)
<i>ESG×B_DIV</i>	-	0.00449 (0.9060)
<i>Industry dummies</i>	Included	Included
<i># of Observations</i>	169	169
<i>Adjusted R-square (%)</i>	68.79%	68.61%

**Notes:**

$$\begin{aligned}
 TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 ROA_t + \beta_7 B\_IND_{t-1} + \beta_8 B\_DIV_{t-1} + \text{Industry dummies include} + \varepsilon_t
 \end{aligned}
 \tag{6}$$

$$\begin{aligned}
 TOBINQ_t = & \alpha + \beta_1 SIZE_t + \beta_2 LEVERAGE_t + \beta_3 GROWTH_t + \beta_4 LOSS_t + \beta_5 ESG_t \\
 & + \beta_6 ROA_t + \beta_7 B\_IND_{t-1} + \beta_8 B\_DIV_{t-1} + \beta_9 ESG \times B\_IND \\
 & + \beta_{10} ESG \times B\_DIV + \text{Industry dummies included} + \varepsilon_t
 \end{aligned}
 \tag{7}$$

<sup>a</sup> p-values are based on White's (1980) heteroscedasticity consistent variance covariance matrix.

\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively.