RESEARCH ARTICLE

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Exploring environmental, social, and governance disclosure effects on the S&P 500 financial performance

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Abstract

Much of the literature measuring the relationship between environmental, social, and governance (ESG) scores and firm performance treats the score as a measure of sustainability performance. In this study, we treat a firm's ESG score as a demonstration of strategic choice in the level of transparency that results in increased firm performance as measured by Tobin's Q and return on assets. Performance differences are a result of choice moderated by the size of the firm as measured by employees and sales. We analyze 467 firms in the S&P 500 from 2009 to 2015. Applying legitimacy and stakeholder theory, we find that there is significant difference between groups with respect to disclosure and performance. The results of quartile analysis by sales, capitalization, and Tobin's Q are relevant to understand the influence that the ESG score has on financial performance. ESG influences on Tobin's Q are greatest for large firms as measured by sales, as opposed to the ESG affects on Tobin's Q and return on asset for smallest firms as measured by market capitalization.

KEYWORDS

corporate social responsibility, environmental social governance, legitimacy theory, performance, stakeholder theory

1 | INTRODUCTION

After any corporate maleficence of significance, the government intervenes with updated legislation intended to protect consumers, investors, and others later although the post hoc regulations do little to help those that were impacted already. Given many recent scandals, it is difficult to believe that firms are capable of self-governance. Over the past decade, we have seen robo-signing of mortgages, Wells Fargo signing clients up for accounts without permission, Volkswagen cheating on emissions reporting, and Facebook having to defend its practices to Congress. Yet we continue to put our faith in firms.

There are those firms that act as socially responsible organizations ex ante, which consumers and investors alike must look for signals to identify them. From a consumer perspective, firms that behave responsibly provide goods and services that protect the environment, satisfy needs, protect the consumer, and do so at a reasonable price; from an investor perspective, the socially responsible firms create

value while minimizing risk. However, the identification of socially responsible firms ex ante is difficult due to information asymmetries. Friedman (1970) famously claimed that the only thing that a firm has to do to be socially responsible is to act in the best interest of shareholders. The logic makes sense; the performance of the firm will be born out whether socially responsible or not because those that are not will be boycotted, fined, or otherwise put out of business and those that are will be rewarded for the value that is created. It is this relationship between the signals and performance that motivates the current work.

There are those items that a firm is compelled to do such as financial disclosures and avoidance of harmful content, but there is a large area of discretionary activity that the firm may do but is not required. Transparency is something that is often lauded as valuable to consumers and investors. However, as Husted and Allen (2011) noted, there is a point of optimal truth disclosure, a point at which the marginal value of additional disclosure results in value loss to the

market in one direction and the firm in the other. The challenge, then, is to find the point at which the market and the firm get the total maximum value. The Environmental, social, and governance (ESG) scores developed by Bloomberg are one mechanism that signals to the market the level of transparency and disclosure by the firm and an indicator of overall social responsibility. In fact, scores such as Bloomberg's ESG have become an important measure for many investors because it conveys a level of risk. Although the score itself may not be important, it displays a measure of how much information is available to stakeholders beyond the required disclosures and acts as a signal to the market of openness. Bloomberg has greater than 12,200 ESG customers worldwide (Huber & Comstock, 2017), and as such, the scores represent an opportunity for firms to demonstrate corporate social responsibility (CSR) leadership.

Decision makers, policy makers, stakeholders, investors, and corporate managers alike need to understand the effects that ESG disclosure has on financial measures, but it is important to note that the impact is not the same by quartiles according to sales, Tobin's Q and market capitalization. For example, our results suggest that for smaller firms, as measured by sales, ESG disclosure is extremely important. The results obtained by segmentation according to capitalization, sales, and Tobin's Q quartile analysis show that the quartiles are essential to define the effect over the financial performance.

In this paper, we extend the existing literature and recent works in this area by increasing the number of observations, analyzing the sample by quartiles for size of the firm by number of employees and market capitalization, and applying legitimacy and stakeholder theory as the theoretical motivation. In the remaining sections, we first conduct a brief literature review on signaling theory and ESG scores. In the section, after the literature review, we introduce the data followed by the methodological approach. We then present our findings followed by conclusions and future research.

2 | LITERATURE REVIEW

The true nature of the association between the level and type of CSR and performance of the firm has not been determined (Lee, Cin, & Lee, 2016; Lu, Chau, Wang, & Pan, 2014). The want for finding a strong positive relationship between CSR and firm performance is not surprising given the long-held belief that there is a trade-off between the two (Palmer, Oates, & Portney, 1995; Walley & Whitehead, 1994). There are some studies that demonstrate a positive relationship between CSR and firm performance (e.g., Reverte, Gómez-Melero, & Cegarra-Navarro, 2016; Wang and Sarkis, 2013) and those that show mixed or insignificant results (e.g., Barnett & Salomon, 2012). Halbritter and Dorfleitner (2015) considered the relationship between ESG and firm performance from a portfolio perspective. Their findings suggest that investors can no longer expect abnormal returns with regard to low or high ESG firms. Auer and Schuhmacher (2016) consider both geographic regions and industries. Their findings suggest that investors in Europe pay a premium for socially responsible investments whereas investors in the United States and Asia-Pacific region

perform equally with respect to passive market investments. In their meta-analysis of the relationship between CSR and performance, Orlitzky, Schmidt, and Rynes (2013) found a positive but weak relationship. Heeding the call to search for the moderating variable in the relationship, Wang and Sarkis (2017) were able to demonstrate the impact that CSR outcomes have on mediating the relationship between CSR governance and financial performance. However, much of this literature takes the ESG score as a measure of the actual sustainability performance of the firm rather than what it truly is: a measure of disclosure.

The ESG score of a particular firm does not measure the actual performance with respect to the environment, social, or governance measures within the score. In fact, a firm may perform very poorly with respect to the environmental performance (e.g., high greenhouse gas emissions) and still score highly with respect to ESG because of the managerial choice to disclose. Hence, instead of continuing the search for the specific relationship between CSR and performance, we work within the framework of strategic management and take the position that firms take a strategic position with respect to CSR and employ managerial discretion to voluntarily disclose or not thereby positioning themselves within a strategic group. Building on others in this domain, we take legitimacy theory as the theoretical lens with which to build an understanding of the relationship between ESG signals and firm performance (Lai, Melloni, & Stacchezzini, 2016; Wang & Sarkis, 2017) as well as stakeholder theory (Freeman, 1984; Sahut & Pasquini-Descomps, 2015).

2.1 | Legitimacy theory

Under legitimacy theory, the right for the firm to exist is an exogenous grant provided by a social contract that must be continuously renewed. Legitimacy theory posits that ESG activities represent the intent of the firm to represent a moral claim to the social contract (Scherer & Palazzo, 2007, 2011). Unlike previous studies that view ESG scores as a measure of a governance mechanism that firms use to integrate sustainability into their operations (e.g., Wang & Sarkis, 2017), we view the Bloomberg ESG database as a signal of the transparency of the firm. Like other signals (e.g., Leadership in Energy and Environmental Design certification), the ESG score communicates a commitment to disclosure of socially responsible actions (Ivanova & Minutolo, 2018). Given the level of asymmetry between the market and the firm with respect to many socially responsible actions, the Bloomberg ESG score serves as signal that may be used to distinguish the quality of the assertions (Simaens & Koster, 2013). Although, from a performance standpoint, the ESG score may represent a weak signal because it does not fully capture the actual performance with respect to any specific ESG measure, we contend that the score represents a strong signal with respect to transparency and as such is a good proxy for the degree to which the firm seeks legitimacy.

Like most managerial activities, ESG disclosure is heterogeneous, and we see both the intent and motivation to disclose occur along a spectrum with low-level disclosers and high-level disclosers. In their

article, Dupire and M'Zali (2018) claim that CSR may be used as a tool for strategic positioning finding that different CSR activities are used relative to differing competitive pressures. Husted and Allen (2007) state that as firms increase in size, they have more assets at risk and, therefore, a greater need of predesigned strategies. Further, they state that the intent to implement a strategy is not only about the design but also about the proper deployment of the organization's resources and capabilities in such a manner that over time an emerging strategy is visible, which demonstrates the action. Not surprisingly, the creation of a strong disclosure program requires ample resources and capabilities. We would expect that as firms get larger, they would need to maintain the social contract more actively and hence need to disclose more in order to signal to the market the intent to be socially responsible. To this end, we are able to state the following:

> **H1.** *There is a positive relationship with firm size as measured by revenue and firm performance with respect to ESG scores.*

2.2 | Stakeholder theory

We build on the work of Tamimi and Sebastianelli (2017) who use stakeholder theory to evaluate the impact that transparency has on firm performance. Under the stream of stakeholder theory (Freeman, 1984), CSR is seen as an attempt by the firm to manage the myriad relationships that it is responsible for. Under stakeholder theory, researchers assert that firms that are better able to manage the interest of stakeholders outperform those that do not. Porter and Kramer (2011) illustrated how firms can employ their CSR efforts strategically to gain a competitive advantage relative to others in their industry. Since the economic downturn in 2008, investors have become particularly interested in the ESG scores of firms as proxies for how well the firm is managing its stakeholder relationships. Investors use the ESG score as an indicator of "residual risk" (Sharfman & Fernando, 2008), image maintenance (Albuquerque, Durnev, & Koskinen, 2012), and means to lower the cost of capital (El, Guedhami, Kwok, & Mishra, 2011). However, as Sahut and Pasquini‐Descomps (2015) note, most of the studies looking into the relationship between CSR and stakeholder management focus on the United States and not global markets. Their position is that firms that have higher ESG scores perform better as measured by monthly stock returns due to decreased risk; their findings did not hold true for firms in the U.S. market but did in the United Kingdom. Tamimi and Sebastianelli looked deeply into the individual components of the ESG composite score to evaluate the impact that they had on performance as well as the role that governance played on reporting. They found that larger boards tended to have higher ESG scores and that components of the score vary by industry. Tamimi and Sebastianelli also considered firm size, which we extend by analyzing by quartiles.

Each consumer of ESG information has a differing reason to assess the information. Whereas investors may be interested in residual risk, consumers may be more interested in sourcing and labor policies. Although it is difficult to assess every stakeholder group's need for

information, we can assume that as firms have more stakeholders to engage, the need for disclosure increases. Therefore, we propose the following:

> **H2.** *There is a positive relationship with firm size as measured by the number of employees and firm performance with respect to ESG scores.*

2.3 | ESG scores

In order to determine the performance of the firm relative to its responsibility to ESG concerns, some measure has to be used. There is, as stated earlier, no requirement for a firm to disclose how it is conducting its responsibility relative to ESG, and as such, most data are self‐reported. In absence of regulatory requirements and no verification, there is little reason for the market to believe the disclosure. Hence, many organizations are developing proprietary measures of ESG. An analysis of all of the various measures is beyond the scope of this study, but a summary of some of the major providers is available from Huber and Comstock (2017). Following Fazzini and Dal Maso (2016), we use the ESG data from Bloomberg as a proxy for voluntary disclosure and assurance. The ESG data from Bloomberg are a proprietary score but are largely accepted as a stable and accurate measure. Fazzini and Dal Maso used the score for Italian listed firms but note that their sample was small and perhaps not generalizable.

The ESG data from Bloomberg measure the level of CSR activity; Bloomberg collects ESG data from company CSR and sustainability reports as well as other public sources. The ESG data from Bloomberg represent some level of disclosure assurance because it penalizes firms that have "missing data" (Huber & Comstock, 2017). In their work, to identify a "CSR identity," Venturelli, Caputo, Leopizzi, and Mastroleo (2017) use a fuzzy expert system to build a score that will allow the user to order firms as high, medium, or low reporters. The fuzzy expert system allows the user to aggregate all of the ESG elements into a "scored" value and produce a label of the type of CSR firm each represents. Although this approach has some merit, in this study, we are concerned with the identity of the firm not with respect to CSR performance but with respect to ESG disclosure. To this end, we extend the literature to classify the firm not with respect to CSR performance but with respect to overall transparency. Should one desire to, each component of the ESG score can be "drilled‐down" into further in order to see the actual performance on any given metric where available.

Wang and Sarkis (2017) provide a good review of the state of the literature with respect to CSR and firm performance. They cite a growing body of literature in the domain that has resulted in mixed results. In this study, we build on the work of Wang and Sarkis, Seifert, Morris, and Bartkus (2003), and Luo and Bhattacharya (2006), to name a few that look at the relationship between CSR as measured by ESG and firm performance. In an interesting study, Fatemi, Glaum, and Kaiser (2018) used data from KLD Research and Analytics as a proxy for a firm's ESG performance and the Bloomberg ESG score as measure of

disclosure. They found that the ESG score served as a moderating variable for firm performance. Where we extend the body of work and make a contribution to the field's understanding is in the clarification of the relationship. As stated earlier, much of the prior literature has used the ESG score as a measure of performance for CSR. Although the Bloomberg database does provide a single measure that may be used to evaluate CSR performance, the ESG score itself is not a performance measure except, we argue, in so far as it measures disclosure, it is a proxy for transparency. The fact that the results of prior research are mixed may be a function of misclassification of the variable. To this end, we propose that as firms grow with respect to market capitalization, they will be required to disclose more.

> **H3.** *The more that firms with high market capitalization disclose, the greater their performance with respect to ROA and* q.

In the next section, we discuss the nature of the data that was collected and the methodology used. Following the data and methodology, we present the results of the study and then the conclusions.

3 | METHODOLOGY AND DATA

3.1 | Tobin's Q

In order to determine the effect of the ESG on the company's financial performance, we followed the models developed by Yang and Baasandorj (2017). The definition of the company's financial performance is expressed mainly by two indicators: Tobin's Q and return on asset (ROA). Tobin's Q is one of the most used and complete financial indicators to describe the performance of the company, and therefore, it is used in various studies to characterize the management of the company (Alexander & Bucholz, 1978; Ding, Ferreira, & Wongchoti, 2016; Hillman & Keim, 2001; Seo, Moon, & Lee, 2015; Yang & Baasandorj, 2017). Tobin's Q is a rather complex measure to calculate. Given the complexity of calculation, we follow Chung and Pruitt's (1994) approximation of Q, q, which they found accounts for much of the variability of the full calculation. Tobin's q is defined as a ratio of the market value of the firm over its replacement cost; the estimation, q, is given in Equation (1). Tobin's q suggests that if there is good management of the firm's resources and capabilities, then there is added value and the assets have a value greater than their replacement cost.

$$Tobin's\ q_{i,t} = \frac{Market\ Cap_{i,t} + PrefStock_{i,t} + Debt_{i,t}}{Total\ Asset_{i,t}}, \tag{1}$$

where $Market\ Cap_{i,\ t}$ is the market capitalization of all outstanding stock of the firm i in the time t; $PrefStock_{i,\ t}$ is the value of outstanding preferred stock of firm i in the time t; and $Debt_{i,\ t}$ corresponds short-term liabilities net of short-term assets plus the value of the long-term debts of firm i in the time t.

3.2 | Return on assets

For its part, ROA indicates how efficient the firm has been in the use of assets to generate profit. This indicator to measure profitability is one of the most useful to characterize the financial performance of a company (Guenster, Bauer, Derwall, & Koedijk, 2011; Roberts & Dowling, 2002; Yang & Baasandorj, 2017). The definition is the division between net profit and total asset, according to Equation (2).

$$ROA_{i,t} = \frac{Net\ Profit_{i,t}}{Total\ Asset_{i,t}} \tag{2}$$

3.3 | Model development

Following the methodology of Yang and Baasandorj (2017), two models are defined, one for each of the financial performance indicators. The first model (Equation [3]) has Tobin's q as a dependent variable whereas the explanatory variables are the profitability, the size of the company, its financial ratio and age as control variables, and the ESG as a variable to test its impact. Following Chen and Gavious (2015), we use the relationship between debt and asset, the percentage of assets that are financed. For profitability, as previously explained, the ROA is one of the most suitable indicators used for these purposes. The age of the firm is measured by the years that the company has been trading its shares in the U.S. stock market. As a measure of size, we chose to measure firm sales (Wang & Sarkis, 2017) and the number of employees (Lee et al., 2016). Equation (3) includes ROA, debt to asset, and firm size.

$$Tobin's\ q_{i,t} = \alpha_o + \alpha_1\ ROA_{i,t} + \alpha_2\ DTA_{i,t} + \alpha_3\ SIZE_{i,t} \\ + \alpha_4\ ESG_{i,t} + \alpha_5\ AGE_i + \epsilon_{i,t}, \tag{3}$$

where $DTA_{i,\ t}$ corresponds to the debt to asset ratio for firm i in time t, $SIZE_{i,\ t}$ is the variable related to the size either the number of employees or the annual sales of the firm i in the time t, $ESG_{i,\ t}$ is the ESG score of firm i at time t, and AGE_i is the number of years from the launch of the stock until the last year of the study.

The second model has ROA as a dependent variable, whereas the other independent variables are maintained (Equation [4]).

$$ROA_{i,t} = \alpha_o + \alpha_1\ DTA_{i,t} + \alpha_2\ SIZE_{i,t} + \alpha_3\ ESG_{i,t} + \alpha_4\ AGE_i + \epsilon_{i,t} \tag{4}$$

Each of the two models is analyzed for the total number of companies as well as for different segmentations in quartile according to sales, market capitalization, Tobin's q, and ESG in order to have more detailed information on the effect of ESG.

4 | RESULTS

4.1 | Descriptive statistics

Of the 500 component shares of the Standard and Poor 500, the values of ESG, debt to assets, age, size, and ROA were sourced from

the Bloomberg database. Finally, of the 500 shares, 467 had the minimum information to be part of the panel data of the models. The period studied includes those from 2009 to 2015 with values derived from the end of each year.

Figure 1 illustrates the breakdown of the ESG for the groups of companies analyzed by quartile, and descriptive statistics are reported in Table 1. The average ESG score in 2009 was 25.13; later, it increased until 2013, rising to 31.60. In the last 2 years of the analysis, the average remained almost constant 31.75 and 31.83 for the years 2014 and 2015, respectively. From the analysis of quartiles, it can be observed that the first quartile has a lower dispersion than the other quartiles, which means that the bottom quartile of firms as measured by ESG has little difference in scores. It is also seen that in the last 2 years, the bottom quartile increased dispersion but decreased the minimum, because the bottom percentile's value remained close to 20.00. The second quartile in the years of study has been widening its dispersion and increasing its upper limit (median), which shows that there has been a progress on the part of this group of companies to improve their ESG. In the years 2014 and 2015, the median was around 30. The third quartile has kept its dispersion relatively constant over time, and in the last 3 years, its highest threshold (P75%) has been placed around 43. Finally, the fourth quartile is the one that shows the greatest dispersion, illustrating greater heterogeneity among the 25% of the companies that have the best ESG. The maximum ESG was reached in the years 2010, 2011, and 2013 around 76.

The q ratio in the first two quartiles demonstrates very low dispersion. The minimum q ratio is relatively constant over the years between 0.7 and 0.8, whereas the median had an increase in the last 2 years, reaching close to 1.8, which implies that half of the companies have a market value equal to or less than 1.8 times the replacement cost of assets. In all years, the mean is greater than the median because there is a high dispersion in the fourth quartile. In fact, in the last 2 years, there are companies with a q ratio higher than 14. In 2009, 8.8% of the companies had a Tobin's q less than 1, which implies that their replacement cost of the assets was greater than the value creation of the firm, whereas in 2016, only 5.6% of the companies had a value less than 1. For a better understanding, the graph

shows the P95%, which illustrates that 5% of the companies have a Tobin's q greater than the dispersion. The P95% of the last 3 years is around 5.0 (Figure 2).

With respect to ROA, we see a high dispersion of the results for firms in the first and fourth quartiles. Fifty percent of the companies (Quartiles 2 and 3) maintain their performances in a relatively constant interval over time, between 2% and 10% approximately. The ROA average has remained constant throughout the period of study between 5% and 7% (Figure 3).

With respect to the other variables analyzed, the average number of employees of firms in the study increased from 45,561 to 50,026, values well above the median, which indicates that there is a high proportion of companies with less than 45,000 employees. In fact, in 2015, there are 114 firms in the S&P 500 with less than 8,100 employees. The rank of the quartile for firms with more employees is very broad, 50 times the P75%. Since 2012, the average sales of the firms analyzed have been more than 20 billion dollars per year as shown in Table 1. Descriptive statistics. Again, the median is approximately half of the average, which shows a high contraction of companies with lower sales. Unlike the number of employees, the difference between P75% and the company with the highest sales is lower, indicating a concentration in the high level of sales. The indebtedness of the firms analyzed is on average almost 31% in 2015. Most companies have a debt to asset ratio between 18% and 42%. The averages of the firms over the period of study are relatively similar. Since 2010, firms have acquired more debt, both in their median and in P25% and P75% as illustrated in Table 1. In the years studied, the median and the average of the stock market capitalization of the studied firms have been increasing, except for 2015. In 2015, the stock market capitalization of the firms in the study amounted to 37.9 billion dollars, more than twice the median, which implies that there is greater dispersion of half of the firms with higher values than those with the lowest capitalization. In fact, the P75% is similar in 2015 to the average; that is, almost 75% of the companies have lower than average capitalization.

With respect to age, measured as the years of transaction in U.S. stock market at the last year of study, the companies studied have
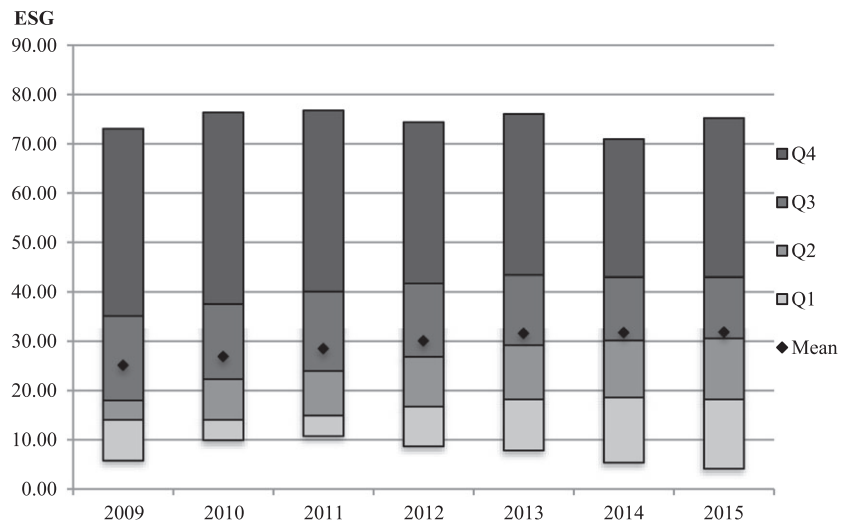

FIGURE 1 Breakdown of environmental, social, and governance scores by quartile: 2009–2015

TABLE 1 Descriptive statistic of independent variables

Variable	Statistic	2009	2010	2011	2012	2013	2014	2015
Number of employees								
	Mean	45.56	46.63	45.70	47.45	47.12	48.43	50.02
	Median	16.35	16.10	16.85	17.35	18.14	18.35	18.73
	Min	61	79	83	97	116	125	132
	Max	2,100,000	2,100,000	2,100,000	2,200,000	2,200,000	2,200,000	2,200,000
	P25%	5.58	5.70	6.04	6.89	7.00	7.65	8.10
	P75%	40.84	42.20	44.92	47.85	47.79	49.37	50.05
	N	366	368	382	388	412	451	455
Sales								
	Mean	16.72	18.16	19.59	20.32	20.63	21.18	20.58
	Median	6,028	7,059	7,516	8,012	8,173	8,707	9,113
	Min	280	281	330	409	489	538	570
	Max	404,374	408,085	433,526	446,950	468,650	476,294	485,651
	P25%	2,690	2,782	3,183	3,334	3,651	4,105	4,126
	P75%	15,040	15,836	16,809	17,621	18,124	19,014	18,311
	N	457	459	462	465	467	467	466
Debt to asset								
	Mean	26.25	25.63	26.13	26.63	27.32	28.36	30.87
	Median	24.29	23.28	23.91	24.96	25.57	26.57	29.13
	Min	0.03	0.03	0.00	0.00	0.03	0.08	0.03
	Max	106.38	118.33	125.06	103.05	98.42	110.60	100.55
	P25%	13.28	12.90	13.03	13.32	14.33	15.38	18.29
	P75%	36.30	35.57	36.55	37.18	36.93	38.66	41.54
	N	424	429	437	437	440	449	449
Market capitalization								
	Mean	20,868	24,173	24,329	27,645	34,074	37,782	37,907
	Median	8,008	10,317	10,693	12,031	15,343	17,965	17,800
	Min	337	650	815	959	1,486	2,056	2,313
	Max	322,334	364,064	401,254	626,550	438,702	591,016	639,939
	P25%	4,186	5,711	5,640	7,251	9,036	10,372	10,233
	P75%	19,589	23,225	22,950	25,446	31,744	35,849	36,399
	N	432	433	443	448	454	457	461

Note. Sales expressed in millions of dollars.

26.2 transaction years. The median is higher than the average, 28 years, which implies that there are more older firms than the average age, whereas P25% is 18 years and P75% is 35 years, which shows that age has relatively similar quartiles in dispersion.

4.2 | Model 1

When applying Model 1 with the variable size and sales (Table 2— Panel A), we see that in the variables that influence Tobin's q significantly are ROA, debt to assets, and ESG. All have a positive influence, which is a summary of the overall effect. However, when analyzing the model by quartiles according to size of sales, we see that ROA maintains its positive and strong effect for all firms, except for those in the first quartile or 25% of the firms with the lowest sales. With respect to the lowest quartile of firms, ROA loses significance in Model 1; however, the effect of sales is significant. One may concluded that for the firms with the lowest sales, the first thing that the market demands is that they increase their sales and only then that they are profitable. With respect to indebtedness, the only effect

seen at a general level is transferred to the firms with the highest sales, the top quartile. ESG reaffirms the challenge of small businesses because its effect is positive for only those firms in the top half of earners according to sales, leaving it clear that for small businesses, the important thing is to sell.

4.3 | Model 2

When we change the model to include number of employees as the measure of size (Table 2—Panel B), we see that there is a significant and positive effect of ROA and ESG on firm's Tobin's q. Not only less significant but also positive is the effect that the number of employees and indebtedness has on performance. That is, in general, the more profitable (ROA) a firm is, the better the ESG score the company has; the more employees there are and the higher their indebtedness, the higher Tobin's q. These results support both Hypotheses 1 and 2. When doing the analysis by segmentation of quartiles according to sales, it can be observed that for the big companies and the med–big companies (companies of the top two quartiles of sales),
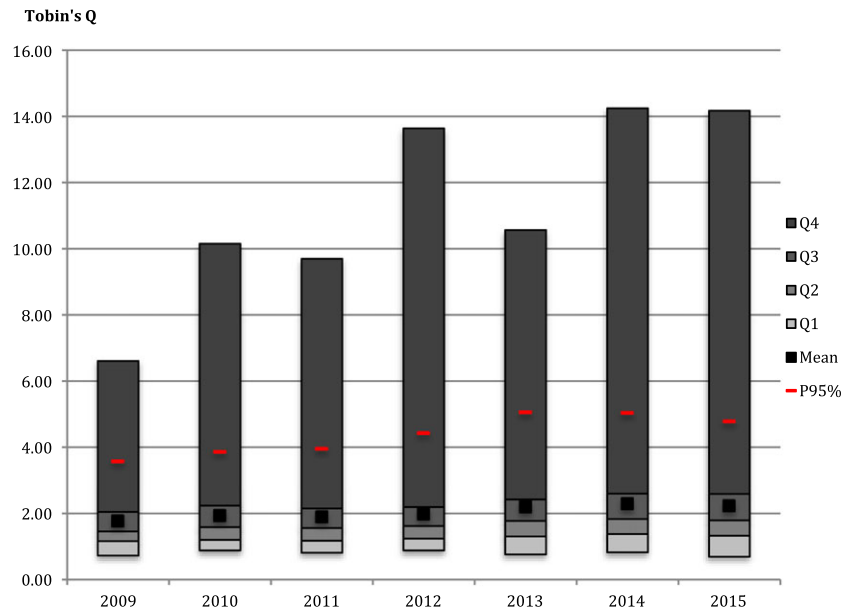
FIGURE 2 Breakdown of Tobin's *q* by quartile: 2009–2015 [Colour figure can be viewed at wileyonlinelibrary.com]
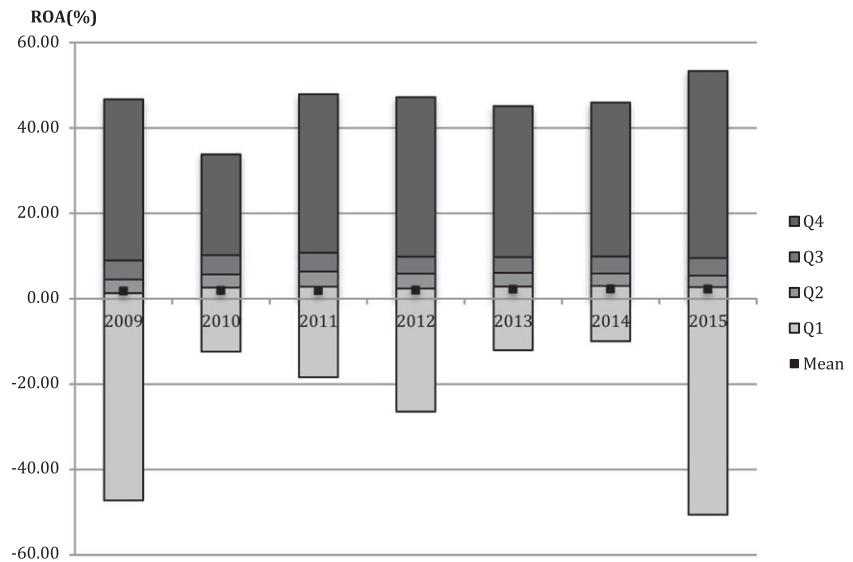

FIGURE 3 Breakdown of return on assets by quartile: 2009–2015

the effect of the ROA persists as well as the effect of the ESG, whereas the effect of indebtedness declines. However, for lower quartile firms according to sales, only ROA influences the *q* ratio. For both models, the Hausman test indicated the dominance of models with fixed effects over random effects. The age variable was also excluded because of multicollinearity.

4.4 | Tobin's *q* by segmentation

When performing the segmentation by the market capitalization of the firms (Table 3), we see that ROA is less significant than with the previous models, having an impact on all quartiles except in the med–small. In the sales-based model, we see that for the small and med–small categories, sales are key to improving Tobin's *q*, as well as indebtedness. This last phenomenon can be explained as companies

obtaining credit and being able to borrow from financial institutions. ESG has a positive effect for all segments of companies according to market capitalization except for med–small. It is interesting that for firms with lower capitalization, the ESG score has a strong influence on Tobin's *q*. By including the number of employees as the size variable, we see a similar effect of ROA on Tobin's *q*; although the number of employees in the complete model has an effect, it does not when broken into quartiles. For this reason, the need to analyze the relationship between ESG and performance by quartiles is validated because the effects in the aggregate are not necessarily present in some quartiles. Financial leverage has the same effect as in the sales model; lower market capitalization companies have a positive effect if they are more endowed, which is based on the validation theory of financial institutions. In the case of ESG, they have a strong effect on small businesses and on med–big.

TABLE 2 Model 1: Sales by quartile

| | Panel A: Sales | | | | | Panel B: Employees | | | | |
Variable	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
ROA	0.0258*** (5.38)	0.0266*** (3.48)	0.0164*** (2.82)	0.0314*** (2.87)	0.0168* (1.81)	0.0268*** (4.90)	0.0289*** (3.57)	0.0201*** (3.03)	0.0355*** (2.75)	0.0324** (2.13)
Sales	0.0017 (1.42)	0.0007 (0.69)	0.0530*** (3.59)	0.1338*** (3.11)	0.5266*** (2.83)					
Number of employee						0.0028** (2.23)	0.0024 (1.39)	0.0066 (0.84)	0.0071 (1.16)	0.1636* (1.75)
Debt to asset	0.0088*** (3.01)	0.0128*** (2.68)	0.0085 (1.48)	−0.0010 (−0.21)	0.0015 (0.26)	0.0077** (2.47)	0.0072* (1.82)	0.0111* (1.91)	0.0013 (0.22)	0.0033 (0.54)
ESG	0.0083*** (4.13)	0.0073*** (2.66)	0.0062** (2.02)	−0.0015 (−0.32)	−0.0059 (−0.80)	0.0076*** (3.87)	0.0057** (2.30)	0.0099*** (2.98)	0.0041 (0.72)	0.0035 (0.70)
Constant	1.251*** (10.89)	0.897*** (4.41)	0.647*** (2.60)	1.135*** (4.40)	1.230*** (3.53)	1.174*** (8.54)	0.800*** (2.40)	0.809*** (2.69)	1.446*** (5.64)	1.074** (2.22)
N	2,960	776	754	745	685	2,629	701	687	624	617
Log lik.	−1,819.3	−67.92	−196.0	−403.3	−607.4	−1,566.6	−21.55	−160.9	−339.6	−559.0
Adjusted R^2	0.0683	0.1133	0.1470	0.1439	0.1382	0.0710	0.1137	0.1196	0.0769	0.1230

Note. ESG: environmental, social, and governance; ROA: return on asset. The number of employee is expressed as 1,000 and the sales as billions of U.S. dollars.

***, **, * significant at .01, .05, and .10, respectively.

TABLE 3 Model 1: Market capitalization by quartile

| | Panel A: Sales | | | | | Panel B: Employees | | | | |
Variable	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
ROA	0.0258*** (5.38)	0.0258** (2.23)	0.0095 (1.42)	0.0105* (1.76)	0.0170** (2.23)	0.0268*** (4.90)	0.0278** (2.29)	0.0105 (1.48)	0.0141** (2.37)	0.0131* (1.70)
Sales	0.0017 (1.42)	−0.0001 (−0.12)	0.0014 (0.72)	0.0182*** (2.90)	0.0406*** (3.17)					
Number of employee						0.0028** (2.23)	0.0028 (1.19)	0.0011 (1.02)	0.0028 (1.34)	0.0073 (0.78)
Debt to asset	0.0088*** (3.01)	0.0103 (1.60)	0.0026 (0.45)	0.0094** (2.40)	0.0095** (2.54)	0.0077** (2.47)	0.0038 (0.56)	0.0019 (0.28)	0.0079** (2.07)	0.0094** (2.32)
ESG	0.0083*** (4.13)	0.0094** (2.54)	0.0121*** (4.49)	0.0007 (0.20)	0.0125*** (3.22)	0.0076*** (3.87)	0.0076* (1.97)	0.0135*** (4.52)	0.0010 (0.28)	0.0138*** (3.27)
Constant	1.251*** (10.89)	1.241*** (4.88)	1.324*** (7.19)	1.489*** (9.59)	0.943*** (6.52)	1.174*** (8.54)	1.087*** (2.79)	1.225*** (5.80)	1.575*** (9.66)	1.001*** (5.26)
N	2,960	753	726	737	723	2,629	674	657	644	634
Log lik.	−1,819.30	−353.39	−144.02	−89.06	−138.02	−1,566.59	−264.37	−132.02	−55.67	−86.97
Adjusted R^2	0.0683	0.0626	0.0447	0.0540	0.1421	0.0710	0.0636	0.0556	0.0394	0.1132

Note. ESG: environmental, social, and governance; ROA: return on asset.

***, **, * significant at .01, .05, and .10, respectively.

In the segmentation by Tobin's q (Table 4), we see an effect of ROA for the three top quartiles, regardless of whether the measure of size is sales or number of employees. Interesting is that for the bottom quartile firms in the sales model, ESG is the only variable that is significant with Tobin's q. This result is very interesting and should encourage firms, regardless of size, that improving disclosing more improves overall performance with respect to Tobin's q. In fact, the effect of the ESG in the sales model is for all quartiles. Both effects also show the employee number model, showing the robustness of the analysis and the conclusions that can be drawn for the companies of smaller Tobin's q. Finally and in the same line, it can be seen that when segmented by ESG, the effect of the ESG on Tobin's q remains universal and strong. We also see that for companies with low ESG scores, if they only focus on improving disclosure, then they will increase their performance. These results confirm the importance of ESG to the financial performance of the firms, which supports Hypothesis 3. We say more about the significance of these findings in our discussion section.

4.5 | ROA by segmentation

When doing the analysis to explain the impact on performance as measured by ROA, we see in Model 2 (Table 5) that the only variable that influences in total and for each of the quartiles by sales is the ESG for both models. This effect shows the importance and relationship that exists between the ESG and ROA. Universally, the market responds to disclosure. More importantly, the more that a firm discloses, the greater the increase in ROA. There are a variety of mechanisms that may be causing this relationship. Although beyond the scope of the current study, we suspect that the signal (disclosure) is a proxy for the stakeholder coordination, the result of which is greater returns. Underlying the disclosure score is the activities that result in the score. The sum of all of the activities is likely the driver of the impact. In Model 2, we also see that debt in addition to disclosure as an effect on ROA.

In the case of segmentation by market capitalization (Table 6), we see that the only size variable that has an effect on market capitalization is sales. Sales have a positive effect for all quartiles except med–small, which is based on an effect of economies of scale, whereas with higher sales, the marginal cost decreases increasing overall profitability and hence ROA increases. In this model, the effect of indebtedness has a negative effect, which is explained by the generation of interest by the debt-decreasing profitability and hence ROA. ESG has a strong impact on ROA for all quartiles except for high-sales (big) companies. This effect is seen in both the sales panel and the number of employees panel, which supports the relationship between ESG and the ROA.

In the analysis of the segmentation by Tobin's q (Table 7), we see that sales have an effect, whereas the number of employees does not influence the results, supporting the effect of economies of scale. The effect of indebtedness is negative again, independent of the variable size, showing the effect of interest. ESG is only influential

TABLE 4 Model 1: Tobin's q by quartile

Variable	Panel A: Sales					Panel B: Employees				
	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
ROA	0.0258*** (5.38)	0.0548*** (4.01)	0.0055** (2.50)	0.0085*** (4.00)	0.0023 (1.53)	0.0268*** (4.90)	0.0643*** (4.07)	0.0055** (2.44)	0.0105*** (3.75)	0.0024 (1.43)
Sales	0.0017 (1.42)	0.0124 (1.41)	0.0025 (0.93)	0.0034*** (2.82)	0.0003 (0.70)					
Number of employee						0.0028** (2.23)	0.0039* (1.70)	0.0024 (1.39)	0.0001 (0.05)	−0.0002 (−0.43)
Debt to asset	0.0088*** (3.01)	0.0119 (1.62)	0.0042** (2.18)	0.0033** (2.41)	0.0015 (1.28)	0.0077** (2.47)	0.0100 (1.15)	0.0043** (2.10)	0.0031* (1.82)	0.0013 (1.11)
ESG	0.0083*** (4.13)	0.0190*** (2.67)	0.0092*** (4.51)	0.0062*** (5.13)	0.0031*** (5.22)	0.0076*** (3.87)	0.0207** (2.21)	0.0088*** (4.27)	0.0064*** (5.07)	0.0029*** (4.85)
Constant	1.251*** (10.89)	1.778*** (5.30)	1.468*** (16.02)	1.044*** (18.86)	0.934*** (26.01)	1.174*** (8.54)	1.690*** (4.23)	1.401*** (11.24)	1.117*** (15.04)	0.956*** (24.87)
N	2,960	660	758	768	774	2,629	554	656	680	739
Log lik.	−1,819.30	−754.33	205.13	575.88	1,057.46	−1,566.59	−643.58	210.62	520.44	1,008.77
Adjusted R²	0.0683	0.0626	0.0447	0.0540	0.1421	0.0710	0.0636	0.0556	0.0394	0.1132

Note. ESG: environmental, social, and governance; ROA: return on asset.

***, **, * significant at .01, .05, and .10, respectively.

TABLE 5 Model 2 analyzed by sales quartile

Variable	Panel A: Sales					Panel B: Employees				
	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
Sales	0.0017 (1.42)	0.0124 (1.41)	0.0025 (0.93)	0.0034*** (2.82)	0.0003 (0.70)					
Number of employee						0.0028** (2.23)	0.0039* (1.70)	0.0024 (1.39)	0.0001 (0.05)	−0.0002 (−0.43)
Debt to asset	0.0088*** (3.01)	0.0119 (1.62)	0.0042* (2.18)	0.0033** (2.41)	0.0015 (1.28)	0.0077** (2.47)	0.0100 (1.15)	0.0043** (2.10)	0.0031* (1.82)	0.0013 (1.11)
ESG	0.0083*** (4.13)	0.0190*** (2.67)	0.0092*** (4.51)	0.0062*** (5.13)	0.0031*** (5.22)	0.0076*** (3.87)	0.0207** (2.21)	0.0088*** (4.27)	0.0064*** (5.07)	0.0029*** (4.85)
Constant	1.251*** (10.89)	1.778*** (5.30)	1.468*** (16.02)	1.044*** (18.86)	0.934*** (26.01)	1.174*** (8.54)	1.690*** (11.24)	1.401*** (11.24)	1.117*** (15.04)	0.956*** (24.87)
N	2,960	660	758	768	774	2,629	554	656	680	739
Log lik.	−8,353.52	−1,923.74	−2,123.40	−1,948.17	−1,975.67	−7,337.75	−1,699.35	−1,952.01	−1,621.52	−1,712.45
Adjusted R^2	0.0683	0.0626	0.0447	0.0540	0.1421	0.0710	0.0636	0.0556	0.0394	0.1132

Note. ESG: environmental, social, and governance.

***, **, * significant at .01, .05, and .10, respectively.

TABLE 6 Model 2 analyzed by market capitalization quartile

Variable	Panel A: Sales					Panel B: Employees				
	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
Sales	0.0379*** (3.08)	0.0302*** (2.68)	0.0665*** (2.70)	0.0968 (0.75)	0.4894** (1.98)					
Number of employee						0.0011 (0.15)	0.0007 (0.05)	−0.0032 (−0.29)	0.0254 (0.55)	−0.0238 (−0.43)
Debt to asset	−0.1476*** (−5.53)	−0.0927*** (−2.69)	−0.1074** (−2.28)	−0.0711* (−1.84)	−0.1834*** (−3.90)	−0.1536*** (−5.18)	−0.0760* (−1.86)	−0.1236*** (−2.38)	−0.0932*** (−2.76)	−0.1690*** (−3.23)
ESG	0.0508*** (3.21)	−0.0021 (−0.07)	0.0923*** (2.91)	0.0689** (2.16)	0.1044*** (3.52)	0.0540*** (3.29)	0.0029 (0.10)	0.0965*** (2.75)	0.0735*** (2.30)	0.1345*** (4.54)
Constant	7.930*** (8.89)	8.373*** (5.43)	4.606*** (2.82)	5.728*** (4.13)	5.917*** (4.13)	8.464*** (9.10)	8.739*** (4.03)	5.903* (3.39)	6.068*** (4.59)	7.197*** (4.68)
N	2,980	753	726	737	723	2,641	674	657	644	634
Log lik.	−8,353.52	−1,896.16	−1,876.07	−1,946.09	−1,998.92	−7,337.75	−1,673.46	−1,698.95	−1,635.51	−1,743.39
Adjusted R^2	0.0533	0.0309	0.0411	0.0188	0.1138	0.0556	0.0102	0.0365	0.0287	0.0960

Note. ESG: environmental, social, and governance; ROA: return on asset.

***, **, * significant at .01, .05, and .10, respectively.

and strongly for the med–small companies, which indicates that there is a transition interval between small and large companies where a better ESG is related to better financial performance.

5 | SUMMARY AND CONCLUSION

In this paper, we were motivated by the growing body of literature that looks at the relationship between ESG scores and firm performance. In particular, we were interested in looking at the ESG scores not as a measure of performance but rather as a measure of overall transparency. Drawing on the legitimacy and stakeholder theory, we hypothesized that there would be a positive and significant relationship between the ESG score and firm performance because it reinforces the social contract between the firm and various stakeholders. However, we hypothesized that there would be difference in the relationship driven by the relative size of the firms according to number of employees and level of sales. All three of the hypotheses proposed in the literature section of the paper were supported, and in fact, we observed differences in the relationship between ESG and performance by segmentation. Our results support other work in this domain (e.g., Wang & Sarkis, 2017) but add additional depth of understanding by refining the variable and segmenting the firms. Further, we have extended the period of evaluation given that the Bloomberg ESG score has now had a longer period of tracking.

Of significance to practitioners is that disclosure matters. As proposed earlier in the paper, the ESG score itself does not drive the relationship but rather serves as a proxy for stakeholder communication. Within the ESG score are measures of waste (e.g., greenhouse gas emission, water effluence, and land fill diversion), governance (e.g., board diversity and board meeting frequency), and social (e.g., consumer rights and law suites) to name a few. Although any one individual may not have an interest in each component, there are people in the market that have an interest in some component. Hence, in the aggregate, the market has an interest in all of the data that the ESG score represents. We found that there are instances where it makes more sense for some firms to report less than others and some cases to report more than others. For instance, when firms are small, they may need to focus on earnings more than on reporting, and when they are large, they may need to focus more on reporting than on earning.

In all cases, in the full models, ESG has a positive effect on Tobin's q and ROA. From the quartile analysis, it can concluded that ESG influences on Tobin's q for the largest firms by sales; in contrast, ESG affects on Tobin's q and ROA for the smallest firms by capitalization.

Although our study has added a contribution to the body of literature, there is still more to do that may further clarify the nature of the relationships found herein. For instance, although we found that reporting is important and that it appears that there may be no upper bound, the true relationship may be curvilinear. Building on Husted and Allen's (2011) work, the returns to reporting may decline fast the optimal truth disclosure point. Future research may refine further

TABLE 7 Model 2 analyzed by Tobin's Q quartile

Variable	Panel A: sales					Panel B: employees				
	Full	Big	Med–big	Med–small	Small	Full	Big	Med–big	Med–small	Small
Sales	0.0379*** (3.08)	0.0666 (0.77)	0.0428** (2.34)	0.0367** (2.38)	0.0405** (2.57)					
Number of employee						0.0011 (0.15)	0.0023 (0.29)	0.0336 (1.23)	0.0189 (1.04)	0.0183 (0.72)
Debt to Asset	0.1476*** (−5.53)	−0.0756* (−1.89)	−0.1769*** (−3.36)	−0.1652*** (−3.75)	−0.4134*** (−3.19)	−0.1536*** (−5.18)	−0.0661 (−1.43)	−0.1570*** (−2.88))	−0.1696*** (−3.48)	−0.4103*** (−3.03)
ESG	0.0508*** (3.21)	0.0595 (1.57)	0.0130 (0.26)	0.0888*** (3.71)	−0.0054 (−0.23)	0.0540*** (3.29)	0.0661 (1.22)	0.0014 (0.02)	0.0913*** (3.49)	−0.0131 (−0.56)
Constant	7.930*** (8.89)	11.970*** (7.45)	10.931*** (4.56)	5.8736*** (3.81)	10.665*** (3.11)	8.464*** (9.10)	12.042*** (7.50)	9.504*** (3.59)	5.860*** (3.83)	10.988*** (3.35)
N	2,980	660	758	768	774	2,641	554	656	680	739
Log lik.	−8,353.52	−1,837.68	−2,135.68	−1,855.11	−2,000.01	−7,337.75	−1531.70	−1,845.39	−1,547.55	−1,898.41
Adjusted R^2	0.0533	0.0182	0.0508	0.0911	0.1797	0.0556	0.0105	0.0400	0.1096	0.1804

***, **, * significant at .01, .05, and .10, respectively.

the nature of the relationship to determine where low and high disclosing firms underperform relative to the optimal point. Further, there may be some learning effects that, to our knowledge, have yet to be tested. In this particular study, we evaluate firms in the S&P 500. What we did not account for was difference that might occur within different industries. In may be the case that the level of disclosure and the need for legitimacy vary according to industries. Future research may look into these areas.

ETHICAL APPROVAL

This article does not contain any studies with human participants or animals performed by any of the authors.

CONFLICT OF INTEREST

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COMPLIANCE WITH ETHICAL STANDARDS

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