

The Relationship Between Board Composition and the Ratings Given to Green Bonds: An Empirical Analysis

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Abstract

Due to the growing number of green bond issues, a lack of mandatory standards and thus the growing phenomenon of greenwashing, an increasingly greater role is assumed by external auditors who are called upon to certify the ‘greenness’ of green bonds. These include rating agencies, which may be called on to express a green rating for each issue of green bonds. Based on a unique dataset made up of 66 green bond issues together with their respective green ratings from 2015 to 2020, the aim of this paper is to test the relationship between issuers’ board compositions and the green rating assigned to each bond issue. The results obtained confirm some conclusions already present in the existing literature and also open a new field of research concerning the green bond market, which has so far been little analysed, especially with reference to corporate governance.

Keywords: green bond, green bond rating, board composition, board diversity

1. Introduction

In recent years, of the social and responsible investments (SRI) available on the market, green bonds have gained increasing interest from investors. A green bond is issued with the aim of supporting projects that have a positive impact on the environment, such as the development of clean energy, the sustainable use of land, and energy efficiency. The Climate Bond Initiative (CBI) reports that in 2019 the green bond market included issues to a value exceeding USD 250 billion. The greatest growth occurred in Europe, with an increase of USD 50 billion compared to 2018 (+74%), representing 57% of global expansion. Within the private sector, in recent years financial corporations have had the highest market share of issues; however, non-financial corporations reached the same level in 2019. In the same year, building, energy and transport were the three largest categories as regards green bond issues.

The attractiveness of green bonds to investors, which is generated by a growing concern as regards environmental issues, may be a temptation for many companies to issue bonds with a green label but without a real intention to allocate the money raised to environmental projects (the so-called ‘greenwashing’ phenomenon). In order to distinguish real green bonds from those which are greenwashed, in June 2018 the International Capital Market Association (ICMA) issued the Green Bond Principles (GBP), specific guidelines for identifying a green bond. They can be summarized in the following four points: i) the bond issuer must clearly and unequivocally identify the destination of bond revenues; ii) the bond destination projects must be included on a specific list of categories and must be selected through a rigid and objective process; iii) the issuer must ensure maximum transparency in communicating the management of the bond flows; iv) reports must be published to keep investors updated on the progress of the financed projects.

However, GBP are not mandatory; issuers may or may not follow them. For this reason, the ICMA has introduced a check on the true nature of green bonds to be carried out by an external auditor who must possess the characteristics of independence, professionalism, integrity, diligence and confidentiality. The auditor’s task is to draw up a report for each green bond issue, analysing the issuance procedures and the underlying project/s. More specifically, the issuers can obtain a merit judgment on an individual green bond issue by choosing between: a) second party opinion: a certification on compliance with the GBP prepared by institutions with high expertise in the environmental sector and which are independent from the issuer; b) verification: the issuer can request an independent verification of the traceability of the green bond revenues, on the soundness of the financed environmental project and the suitability of the reporting; c) certification: issued by qualified third

parties and experts, it must evaluate the green bond and the use of proceeds in compliance with the GBP; d) green rating: rating agencies issue a specific green rating for each green bond issue. It is important to underline that the green rating is different from the issuer rating: the green rating is based on the evaluation of environmental performance of the green bond and the project underlying the issue itself. It should not be confused with the issuer's rating, which is based on specific characteristics of the issuer. The 2019 CBI report highlights that about 60% of green bonds issued had a second party opinion certification, while the green rating option covered about 3% of the issues (equal to USD 8 billion of issuance). The rating agencies that issued the highest number of green ratings included Moody's, Standard & Poor's, CCX, China Bond Rating, R&J, JCR and RAM. At the international level, from 2015 to the end of June 2020 there were 79 green bond issues with green ratings.

For each of these 79 issues, during the investigation described in this paper the issuer was identified and socio-demographic information for each member of the board collected. Considering the lack of information available for some issuers, a unique dataset made up of 66 issues (83.54% of the total) was created. The purpose of this research is to verify whether there is a relationship between the board composition of the issuer and the green bond rating, based on this unique dataset. The working hypothesis is that the board of directors is a group of people and their decisions are made by the majority of them. The issuing of green bonds depends upon several factors and, among them, the directors' interest in the environment may influence their choice regarding these issues. This research attempts to establish whether there is a relationship between board composition and (green) bond issues. If such a relationship exists, it could be exploited in the opposite direction by investors in their assessment of bond issues. To my knowledge, this is the first paper to analyse the relationship between companies' board composition and the rating attributed to green bond issues.

The results obtained are important from a theoretical and academic perspective because they confirm existing literature on board composition and board diversity, adding an original analysis concerning the recent phenomenon of green bonds. Furthermore, from the investors' point of view, our results may allow identification of the best green bonds through consideration of board composition. In other words, a ranking of the quality of green bond issues could be achieved by analysing the issuer's board composition. In addition, this research should stimulate debate between researchers and regulators as to the desirability of establishing a green certification for boards of directors.

The remainder of this paper is organized as follows. Section 2 presents the main literature on board composition and board diversity and introduces the research hypotheses. Section 3 introduces the sample used in the analysis and Section 4 shows the obtained results. Section 5 discusses the obtained results and concludes.

2. Literature Review and Development of Hypotheses

The variables most widely used in the literature to describe the impact of corporate governance on ESG topics are related to board size, the presence of women on the board, the proportion of independent directors, the age of board members, their level of education, and nationality (e.g., Post et al., 2011; Rao & Tilt, 2016; Setò-Pamies, 2015). In the sub-sections below, I develop my hypotheses for each of these characteristics.

2.1 Board Size

Krishnan and Visvanathan (2009) and Pathan (2009) argue that board size depends on a firm's complexity, so its sector and size are important factors influencing the number of directors. Baker and Gompers (2003), Kocher and Sutter (2005) and Coles et al. (2008) demonstrate that firms with complex businesses need larger boards because of the difficulties involved in monitoring and advising such corporations.

Allegrini and Greco (2013) find a positive and significant effect of board size on governance disclosure in Italy. Esa and Ghazali (2012) demonstrate a positive effect of board size on the extent of CSR disclosure in Malaysia. However, Giannarakis (2014) does not report a significant impact of board size on ESG disclosure.

Laksmana (2008) and Guest (2009) argue that smaller boards might have a low degree of diversification in terms of education, expertise, gender and stakeholder representation. According to De Andres et al. (2005) and Ahmed et al. (2006), smaller boards are expected to be more effective in monitoring and controlling firm governance than larger boards. In particular, Ahmed et al. (2006) and Dey (2008) find that the commitment of directors is higher on smaller boards.

In the light of the above evidence, I advance the following hypothesis:

Hypothesis 1. The larger the board of directors, the lower the green bond rating.

2.2 Board Age

Age diversity within the BoD is expressed as the coexistence of different generations, and therefore of values, motivational goals and experiences influencing the decision-making processes adopted by directors. According to Botwinick (1977) and Burke and Light (1981), cognitive abilities including learning ability, memory and reasoning decrease as people age. Moreover, Carlson and Karlsson (1970) and Vroom and Pahl (1971) demonstrate that older executives tend to avoid risky decisions.

However, it has been shown that the relationship between age and risk-propensity is not clear. Campbell (1987) highlights the fact that younger managers seem to handle new and creative ideas better than older managers; according to Guthrie and Olian (1991), they tend to implement more risky and innovative growth strategies. According to Morin and Suarez (1983), Brown (1990), Bakshi and Chen (1994) and Palsson (1996) a positive correlation between age and risk-propensity is identifiable. Riley and Chow (1992), Halek and Eisenhauer (2001) and Harrison et al. (2007) show that risk aversion decreases with age up until 65 years of age and then increases significantly. Cohen and Einay (2007) find a U-shape in the relationship between age and risk-seeking. Thus senior advisors are more experienced and represent a form of accumulated skill-based competencies, while younger directors seem to be more dynamic, smarter, open to technological change, and active in driving business success and future planning (Handajani et al., 2014).

However, age is negatively associated with environmental attitudes and knowledge of environmental issues (Diamantopoulos et al., 2003). Hafsi and Turgut (2013) argue that a board's average age has no effect on the extent of CSR disclosure, while according to Ferrero-Ferrero et al. (2015) a board of mixed age composition improves the integration of ESG issues into management processes.

Therefore, I propose the following hypothesis:

Hypothesis 2. The younger the board, the higher the green bond rating.

2.3 Board Independence

Several studies document a positive relationship between board independence and CSR (Chen & Jaggi, 2000; Amhed et al., 2006; Jo & Harjoto, 2011; Post et al., 2011; Jizi et al., 2014; Ong & Djajadikerta, 2018). Kaymak and Bektas (2017) indicate that board independence and board size are strongly and positively related to several CSR practices. Ibrahim and Angelidis (1995) and Ibrahim et al. (2003) find that independent directors are more concerned about charitable and philanthropic themes associated with CSR, than inside directors. Webb (2004) finds that firms that engage in CSR initiatives tend to have more independent directors.

Haniffa and Cooke (2005), Lim et al. (2007), Prado-Lorenzo and Garcia-Sanchez (2010), Nurhayati et al. (2015) and Naciti (2019) find that the presence of independent directors on boards has a negative impact on social and environmental disclosure while Mallin et al. (2013) find the same relationship with reference to environmental performance. Further studies document a non-significant association (Walls & Hoffman, 2013; Rao & Tilt, 2016; Walls & Berrone, 2017).

According to Haniffa and Cooke (2005) and Jo and Harjoto (2011) a greater proportion of independent directors increases focus on social and environmental issues, while Holtz and Sarlo Neto (2014) find a positive relationship between board independence and ESG disclosures. Cucari et al. (2018) and Gallego-Alvarez and Pucheta-Martínez (2020) document a significant positive association between companies' board independence and CSR involvement. Further, Hussain et al. (2018), Ibrahim and Hanefah (2016) and Cullinan et al. (2019) find that independent directors are associated with higher levels of CSR performance.

In consideration of the above evidence, I advance the following hypothesis:

Hypothesis 3. There is a positive relationship between the number of independent directors on the board and the green bond rating.

2.4 Board Gender Diversity

Regarding the relationship between board diversity and CSR outcomes, Post et al. (2011) and Ferrero-Ferrero et al. (2015) find that women directors encourage companies to adopt a more socially responsible approach. Generally, the literature suggests that firms with more women on their boards tend to act in more socially responsible ways than those with no women or fewer women. Bear et al. (2010), Setó-Pamies (2015), Ibrahim and Hanefah (2016) and Matuszak et al. (2019) find that the presence of females on the board is significantly and positively associated with CSR disclosure.

Further, female directors on boards may enhance companies' awareness of environmental and social issues and promote the adoption of proactive strategies to respond to corporate stakeholders' social and ethical demands and

expectations (Al-Shaer & Zaman, 2016; Ben-Amar et al., 2017; Hollindale et al., 2019). Boulouta (2013), Hussain et al. (2018) and Cullinan et al. (2019) argue that female directors enhance the sustainability performance of a company. Moreover, several studies suggest that firms with a higher percentage of females on the board present a higher level of charitable giving (Wang & Coffey, 1992; Williams, 2003), more favorable work environments (Bernardi et al., 2006), higher levels of environmental CSR (Post et al., 2011) and more apprehension concerning climate change (Ciocirlan & Pettersson, 2012). However, some studies (e.g., Konrad et al., 2008; Fernandez-Feijoo et al., 2012, 2014; Manita et al., 2018) point out that to have a significant and positive impact on sustainability and corporate governance, there must be at least three women on a BoD. Specifically, Post et al. (2011) argue that boards of directors with three or more female members have a high regard for environmental issues.

There are also studies with different, contradictory results. According to Kilic et al. (2015) and Glass et al. (2016) there is a weak, statistically significant positive impact of board gender diversity on social and environmental reporting, while Deshenes et al. (2015) and Prado-Lorenzo et al. (2009) find a negative association between social and environmental practices and the presence of females on a board. Other studies (Khan, 2010; Walls et al., 2012; Galbreath, 2013; Mallin et al., 2013; Amran et al., 2014; Giannarakis, 2014; Alazzani et al., 2017) find no significant relationship between board gender diversity and a firm's social and environmental policies.

Based on this literature, the following hypothesis is proposed:

Hypothesis 4. The presence of women on the board positively affects the green bond rating.

2.5 Educational Level

Many studies (e.g., Datta & Rajagopalan, 1998; Hambrick & Mason, 1984; Wailderdsak & Suehiro, 2004) consider educational level a good proxy for human capital, knowledge, or intellectual competence. In the literature the subject studied is also considered. Christy et al. (2010) show that the proportion of board members holding a financial degree is negatively associated with the market risk of equity in Australia. Litov et al. (2014) find that lawyer directors reduce corporate risk-taking and increase firm value. Audretsch and Lehmann (2006) argue that directors with academic backgrounds can enhance the competitive advantage of firms by facilitating access to and the absorption of external knowledge spillover.

Therefore, I propose the following hypothesis:

Hypothesis 5. The higher the proportion of economic and financial degrees held by the members of the board, the higher the green bond rating.

2.6 Board Nationality

The debate on board diversity in terms of nationality contrasts a heterogeneous board with its homogeneous counterpart (Hambrick et al., 1996). Rao and Tilt (2016) argue that national diversity in heterogeneous boards improves the quality of decision making for social and environmental actions that promote higher sustainability performance. Harjoto et al. (2019) find that board diversity in terms of nationality is positively associated with corporate social performance and Naciti (2019) demonstrates a positive relationship between board nationality diversity and firm sustainability performance. However, Anazonwu et al. (2018) using a sample of listed manufacturing firms in Nigeria, find no significant positive influence of board nationality diversity on firm sustainability reports, and Janggu et al. (2014), considering 100 publicly listed companies in Malaysia, find that foreign directors do not have a significant influence on sustainability disclosure.

Thus, the literature on the relationship between board nationality diversity and the ESG issue is controversial and heterogeneous. In formulating my hypothesis, I therefore consider the board of directors as a group of people who have to make a specific decision about the issuing of green bonds. From this perspective, according to Gibson (2004), members of a group from different cultures are more likely to respond differently to the same event or managerial decision-making situation. Moreover, Souren et al. (2004) argue that diversity in ethnic origin and nationality appears to interfere with group processes more than does homogeneity in organizational teams. On the contrary, Zhang et al. (2007) argue that homogeneous teams share common views and are likely to interpret and evaluate situational events and management practice in similar ways, i.e., they generally report stronger affinity than heterogeneous teams.

Based on the above considerations, the following hypothesis is proposed:

Hypothesis 6. The higher the number of directors of the same nationality on a board, the higher the green bond rating.

3. Data and Methodology

From 2015 to the end of June 2020, at the international level there were 79 green bond issues accompanied by a green rating. For each of them, the following information was collected: the green rating attributed to the single issue, the name of the green bond issuer and the board composition of each issuer. For each board member, principal socio-demographic information was gathered. Table 1 lists and describes the variables used in this study and shows the expected sign of their impact on the green bond rating. Unfortunately, for some issuers it was not possible to collect all the information of interest: these issuers were excluded from the sample. As a result, the sample consists of 66 green bond issues, representing 83.54% of the total.

Table 1. Description of variables

Variable	Description	Expected sign
<i>Dependent variable:</i>		
greenrating	The rating assigned by an agency to each green bond issue in the sample. It ranges from 0 (worst level) to 3 (best level).	
<i>Independent variables:</i>		
sector	Dummy variable: equal to 1 if the firm belongs to the banking, financial and insurance sector; 0 otherwise	
Ndirectors	Number of directors on the board for each company	-
age	The average age of the directors on the board for each company	-
independent	The percentage of independent directors on the board for each company	+
women	The share of women on the board for each company	+
degree	The percentage of graduate directors on the board for each company	+
findegree	The percentage of graduates in Economics and Finance on the board for each company	+
nationality	Dummy variable: 1 if the percentage of directors of the same nationality on the board for each company is at least 75%; 0 otherwise	+
tenor	The length of loans in years	
amount	The logarithm of the amount of each issue (in USD)	
currency	Dummy variable: 0 if the issue currency is USD; 1 if the issue currency is EUR; 2 if the issue currency is JPY; 3 otherwise	

In Table 1 the ‘tenor’ measures the time in years from origination to maturity date. It is used as a control variable as suggested in the studies by Bauer and Hann (2010), Cooper and Uzun (2015) and Eichhholtz et al. (2019). ‘Amount’ indicates the bond issue amount used as a control variable in the studies by Bauer and Hann (2010), Cooper and Uzun (2015), Eichhholtz et al. (2019) and Oikonomou et al. (2014). Given the different currencies used for the issues, ‘currency’ was also used as a control variable. Table 2 summarizes the descriptive statistics of the variables used in the analysis while Table 3 shows the correlation matrix.

Table 2. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
greenrating	2.7273	0.6690	0	3
sector	0.4091	0.4954	0	1
Ndirectors	7.8333	4.9071	1	18
age	58.2762	7.4835	35	72
independent	0.1215	0.1903	0	0.67
women	0.1103	0.1358	0	0.67
degree	0.9670	0.0624	0.75	1
findegree	0.5076	0.2637	0	1
nationality	0.9242	0.2667	0	1
tenor	9.2121	7.4349	2	40
amount	21.1191	1.9117	14.40	23.63
currency	1.7121	0.9243	0	3

Table 2 shows the green bond rating is on average very high, 2.7 out of a maximum value of 3. The average number of directors is 7.8 while the average age is around 58 years old. The average number of independent and women directors is not particularly high: 12.15 % and 11.03% respectively. More in detail, 43 companies have

no independent directors while 30 have no women on their boards. The level of education is on average very high: 96.70% of directors are graduates. Moreover, 50% of directors have a degree in economics and finance. About 10.6% of the issuers have a board made up of at least 75% directors of the same nationality. The average tenor of the issued bonds is 9 years with a very high variability (SD = 7.43).

Table 3. Correlation matrix

	greenrating	sector	Ndirectors	age	independent	women	degree	findegree	nationality	tenor	amount	currency
greenrating	1											
sector	0.0633	1										
Ndirectors	-0.1265	-0.1487	1									
age	-0.2341	0.0206	0.1356	1								
independent	-0.1616	-0.0556	0.2165	-0.0823	1							
women	-0.3022	-0.2054	0.2742	-0.1520	0.2494	1						
degree	-0.0643	0.0507	0.0315	0.0285	-0.1053	-0.0202	1					
findegree	-0.1712	0.1290	0.0988	-0.4163	0.1586	0.0033	-0.0247	1				
nationality	-0.0314	0.2382	-0.1862	-0.0397	-0.0371	-0.1523	-0.1527	-0.1077	1			
tenor	-0.0872	-0.2703	-0.0332	-0.0173	-0.0723	-0.0212	-0.1438	-0.1513	0.0548	1		
amount	0.2632	0.1920	0.0864	0.2545	-0.1357	-0.4128	0.1114	-0.1575	0.0766	0.0752	1	
currency	-0.0045	0.2275	-0.0616	0.0540	0.1311	-0.2028	0.1900	0.0470	0.2223	-0.2238	0.4628	1

In order to test our research hypotheses, the following ordered logit regressions were run:

$$\text{greenrating} = \beta_1 \text{sector} + \beta_2 \text{Ndirectors} + \beta_3 \text{age} + \beta_4 \text{independent} + \beta_5 \text{women} + \beta_6 \text{degree} + \beta_7 \text{findegree} + \beta_8 \text{nationality} + \beta_9 \text{tenor} + \beta_{10} \text{amount} + \beta_{11} \text{currency} + \varepsilon \quad (1)$$

$$\text{greenrating} = \beta_1 \text{sector} + \beta_2 \text{Ndirectors} + \beta_3 \text{age} + \beta_4 \text{independent} + \beta_5 \text{women} + \beta_6 \text{findegree} + \beta_7 \text{nationality} + \beta_8 \text{tenor} + \beta_9 \text{amount} + \beta_{10} \text{currency} + \varepsilon \quad (2)$$

The ordered logit model is justified bearing in mind that the bond rating presents a specific increasing order from the lower to the higher. In (1) the percentage of degree-holding directors and the share of directors with an economic and financial degree were considered; in (2) the percentage of directors with an economic and financial degree only.

4. Results

Table 4 presents the results of the analysis; the estimates reported in column (1) consider equation (1) while the results in column (2) are related to equation (2).

Table 4. The determinants of the green bond rating

VARIABLES	(1)	(2)
sector	0.796 (1.027)	0.693 (0.823)
Ndirectors	-0.204* (0.123)	-0.204* (0.122)
age	0.0736 (0.0550)	0.0706 (0.0573)
independent	6.364*** (2.436)	6.286*** (2.407)
women	-3.759 (3.949)	-4.214 (3.668)

degree	-2.443 (6.212)	- -
findegree	-4.059** (1.905)	-3.948** (1.685)
nationality	-0.0109 (1.880)	0.112 (1.799)
tenor	-0.128** (0.0647)	-0.126* (0.0652)
amount	0.765*** (0.283)	0.740*** (0.281)
currency	-1.150* (0.609)	-1.173** (0.594)
Observations	66	66
Pseudo R2	0.2992	0.2973

Note. Ordered logit regression. The dependent variable is greenrating. The table reports the odds ratio; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

Overall, the results reported in columns (1) and (2) in Table 4 converge, allowing a single comment on both. The first significant result that emerges is that the number of directors on the board has a negative impact on the green bond rating. This result corroborates the existing literature in favour of smaller boards and thus H1 is confirmed. H2 is not confirmed, as the average age of directors has no significant impact on the attribution of the green rating. Table 4 shows a very strong positive and significant relationship between the percentage of independent directors and the level of rating expressed for the bond issues, so H3 is confirmed. On the contrary, H4 is rejected, given that the percentage of women on the board has no significant impact on the green bond rating. This can be justified by the low number of women on the boards of the issuers examined. The percentage of graduates on the board does not have a significant impact on the green bond rating, while the percentage of directors with a degree in economics and finance has a significant influence on the green rating. However, this impact is negative, so H5 is rejected. H6 is rejected as well because directors being of the same nationality has no impact on the green rating. The results obtained from the control variables included in the model are also interesting. In fact, the longer the bond tenor, the lower the rating attributed to the green bond. Viceversa, the higher the value of the issue, the better the rating level obtained by the green bond. Finally, the lowest ratings are assigned to dollar issues.

5. Discussion and Conclusions

The results obtained from the analysis confirm and corroborate some conclusions found in the existing literature, opening a new field of research linked to green bond issues and the related quality certifications. In particular, in the literature board size gives rise to two opposing strands: on the one hand, many studies demonstrate the importance of larger boards, while others advocate the efficiency and effectiveness of smaller boards. With reference to the rating level obtained by green bond issues, the results presented in this paper favour smaller boards.

In the literature, the role of independent directors on the board does not lead to converging conclusions. The present analysis supports their positive role in obtaining a better rating for green bond issues.

Contrary to our expectations, directors holding an economic and financial degree have a negative impact on the level of the green bond rating. This unexpected result may be due to a combination of determinants: firstly, the average age of board members, which is quite high. This supports the idea that the degree courses of these directors did not consider environmental issues, in contrast with current study programs in many economics faculties. Secondly, and as a consequence, these directors are more oriented towards obtaining short-term performance, while green investments take much longer to produce their effects.

Particular attention should be paid to the meaning of the control variables included in the analysis. The negative relationship between bond tenor and the bond rating can be explained by the fact that long term uncertainty about the macroeconomic scenario is higher than over a shorter period. Therefore, the issuer's financial solvency could be compromised over the longer term, with negative effects on bonds' security. Furthermore, the larger the bond issue size, the greater the possibility of its market remaining liquid. For this reason, the results obtained showed a positive relationship between the total amount of the issues and the bond rating. Finally, the negative relationship between the bond rating and dollar issues may be due to the fact that the majority of the bonds

included in the analysis were issued in Euros while dollar issues are still quite modest. In conclusion, the results obtained suggest some characteristics that green bond issues should have in order to obtain a high level of rating: being a large issue, not having a long tenor and not being in US dollars.

The green bond market offers many avenues for future research. It is still an area which has received little in-depth attention, and which presents multiple facets to be analysed, including that addressed in this paper. Constructive debate and discussion between academics and supervisory authorities would be useful, in order to evaluate the need to define standards so as to permit certification of the green propensity of the boards of individual companies. This could greatly help investors, especially those in the retail sector, who are interested in allocating their investments to companies that are attentive to environmental issues. Indeed, the topic of SRI attracts much attention from investors, who are faced with a plethora of investment opportunities. However, very often they are not able to determine the truthfulness and quality of the proposed investment. Thus external certification, recognized by the supervisory authorities on the basis of compliance with predefined standards, including at the level of the composition of boards of directors, could be useful for dispelling some of the doubts interfering with investors' decision-making processes.

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