

Article

# Does Audit Improve the Quality of ESG Scores? Evidence from Corporate Misconduct

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**Abstract:** One of the main controversial aspects of sustainability metrics relies on the accuracy, transparency, and reliability of the information at the basis of environmental, social and governance (ESG) scores. This paper investigates whether firms that have their ESG reporting audited by independent firms exhibit a higher quality of ESG scores. We performed an analysis investigating the change in ESG scores following the unveiling of a corporate misconduct. We documented that, overall, no significant ESG score adjustment occurs after the scandal becomes public, thus, implying that rating agencies provide an accurate interpretation of the firm's sustainability. However, our results differed when we distinguished between audited and unaudited reports. Firms whose reports are audited by third parties did not exhibit significant changes in their scores after a scandal, whereas for companies whose reports are not audited, we detected a worsening of the ESG scores that are statistically significant. Our findings were also confirmed in a multivariate analysis. Overall, our results suggest that the reliability of ESG scores can benefit from the auditing of sustainability reporting by third parties, which has an assurance effect on the quality of the company's ESG information.

**Keywords:** ESG scores; audit; ESG reports; ESG transparency; non-financial reporting audit; corporate scandals

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## 1. Introduction

The key indicators of a firm's non-financial performance play an increasing role in capital markets beyond traditional metrics [1]. Advocates of the use of non-financial information see it as a way to align managerial incentives with long-term shareholders' value creation, and, ultimately, with the creation of social value [2].

The plethora of environmental, social and governance (ESG) indicators and the investors' need for their assessment and scrutiny have created demand for specialized rating services. ESG rating agencies play a valuation role by disseminating information to market participants, analogous to credit rating providers. In this role, ESG rating agencies gather and analyze the information relevant for assessing environmental, social, and governance quality, and make the results of their analyses available to investors and other stakeholders [3,4]. Since there is no unique definition of ESG performance, an important role they perform is to provide an interpretation of the company's ESG practices and results.

One of the main controversial aspects of sustainability metrics relies on the accuracy, transparency, and reliability of the information that is at the basis of the scores. Normally, evaluations by ESG rating agencies are made using complex questionnaires and an analysis of public information sources [5]. The primary source of rating agencies' information relies on the reporting issued by companies. Where financial reporting has reached standardized forms at an international level, non-financial reporting is still in its infancy. This exposes the ESG information released by companies to varying

degrees of accuracy, which can ultimately impact the reliability of ESG scores. Indeed, if the information that rating agencies receive from companies is noisy at best, the released scores will be also.

The information asymmetry between companies and market participants can be mitigated in the presence of external verification. Third-party assurance about the quality of management's reporting has the potential to increase the credibility of voluntary disclosures [6]. Research has documented that an increasing number of firms seek external expertise to verify the information included in non-financial reporting [7–10]. For example, using a sample of large multinational corporations, Perego and Kolk [8] found that the proportion of firms having their sustainability reports audited increased from 21.4% in 1999 to 55.8% in 2008.

Previous work has also shown that an assurance of sustainability information increases stakeholders' perception of the reliability of ESG reporting and that the demand for assurance services is affected by country, as well as firms' specific factors [11]. However, there is no evidence, to our knowledge, on the impact that audited non-financial reporting can have on the quality of sustainability assessments by raters.

In this paper, we intend to fill this gap and explore whether auditing on sustainability reporting can play a meaningful role in improving the reliability of ESG scores. To do so, we rely on corporate scandals, as in [12–14]. Corporate controversies are publicly observable events that are expected to have negative implications on the firm, as they put its reputation at risk, undermine the trust of stakeholders into the company, and can seriously damage its environmental, social, and governmental sustainability. Focusing on such negative news that usually come as a surprise allows the changes that occur in ESG scores at instances during which market participants revise their beliefs about a firm's sustainability performance and policies to be detected.

We first explore whether the detection of corporate wrongdoing affects the ESG rating by analyzing the change that occurs in ESG scores after the scandal has become public information. A reliable measure of ESG performance should be capable of conveying information about the future sustainability of a company before the scandal is revealed. Therefore, if the ESG rating is of good quality, we expect no significant change in the ESG score at the uncovering of corporate misconduct.

We next assess whether the change in ESG rating at the unveiling of corporate misconduct is affected by the underlying quality of the reported data. If the audit is valuable for ESG company reporting, we expect that the change in ESG scores worsens for firms whose sustainability reports are unaudited.

Our results reveal that the change in ESG scores, which takes place when a controversy is brought to public attention, is not significantly affected by the negative event. Therefore, on average, the score revision is not impacted by the scandal, which can be interpreted as good news for the quality of ESG scores, as rating agencies provide an accurate interpretation of the firm's sustainability. However, our results differ when we distinguish between audited and unaudited reports. Firms whose reports are audited by third parties do not exhibit significant changes in their scores after a scandal, whereas for companies whose reports are not audited, we detect a worsening of their ESG performance that is statistically significant. Our findings are also confirmed in a multivariate analysis. Overall, our results suggest that the reliability of an ESG rating can benefit from the auditing of sustainability reporting by third parties, which have an assurance effect on the quality of a company's ESG information.

Our paper contributes to the literature on the quality of ESG data and the reliability of ESG scores. The issue of whether ESG data can accurately reveal a firm's non-financial performance is of primary importance. Not only does the quality of data have key implications for rating agencies, but also for investors, companies, and researchers. When ESG metrics capture a firm's performance on ESG issues as accurately as possible, then investors can incorporate the data into their business analysis and valuation tools; companies are able to integrate their sustainability efforts into their operating processes and investment strategies; researchers will be more effective in detecting relationships between ESG metrics and financial performance [15–21].

Our research has also policy implications. There is a mounting debate on the need for more reliable non-financial information. The actual context mostly relies on voluntary disclosure, as there are no generally accepted information framework or reporting standards. This turns out to be an obstacle to the consistency of the reporting and comparison of ESG performance across companies at least within the same industry. Regulatory initiatives (such as the Directive 2014/95/EU adopted by the European Union) are increasing and the findings of our paper can help in facilitating a discussion on the challenges that the quality of ESG data poses.

The remainder of the paper is organized as follows. Section 2 provides a review of the related literature. Section 3 presents the sample, data, and the model. Section 4 discusses the results. Section 5 focuses on robustness checks. Section 6 concludes. Section 7 discusses the limitations of the data.

## 2. Literature Review

Equity investors put a lot of effort into seeking investment opportunities where positive ESG factors signal future growth [22]. Equity analysts rely on non-financial information to improve the accuracy of their forecasts [23]. Asset managers use an ESG criteria to sort in and sort out companies from their portfolios. There is now more than \$30 trillion that is globally invested in sustainable ways [24].

There is, then, an increasing demand of reliable and accurate ESG scores. Indeed, the construction of sustainability scores poses several controversial issues that relate to the complexity of the term sustainability, the choice of criteria, their measurement using scores, and how to judge whether the criteria have been met [25,26]. There is evidence that ESG ratings tend to diverge across rating agencies [27–31]. Measurement divergence—i.e., the situation where rating agencies measure the same characteristic using different indicators—seems to account for the largest part of the discrepancy [32]. It is of no surprise, then, that rating agencies are subject to criticism [5,33–35].

ESG raters may adopt different definitions of ESG performance or they may measure the same item in different ways; however, they primarily base their analyses on non-financial information released by companies. Nearly every company now issues some form of sustainability reporting. While financial reporting is by now highly regulated and standardized, there are no legally binding standards for sustainability disclosure. A few initiatives have been launched to push the development of more rigorous and systematic reporting of non-financial information [36]; however, mandatory reporting is still lacking.

A voluntary regulatory environment has its drawbacks, as it provides incentives to companies to engage in some forms of greenwashing [37]. There is actually evidence that firms tend to overstate beneficial private information to create a misleadingly positive public impression [38–41]. This can undermine confidence in sustainability reporting and in the reliability of ESG scores.

The credibility gap in non-financial disclosure has consequently increased the demand from companies of third-party assurance over their sustainability reports [7–10]. This relies on the shared view that information is more credible if it has been subjected to independent examination by an auditor. Prior work has shown that the provision of assurance can increase stakeholders' perceptions of the reliability of the sustainability report [42–46]; however, there is no evidence, to our knowledge, about the usefulness of audit in the improvement of ESG rating scores. Not only is third-party ESG assurance a voluntary decision, but it also comes with a cost that is arguably born when there is an expectation of benefits outweighing the costs [9]. Benefits may come in the form of increased market participants' confidence in a company's non-financial reports and in ESG rating scores that build on those reports. Indeed, auditors are called to play a role in detecting and preventing the misrepresentation of information and may also be valuable at uncovering misbehavior in organizations.

Corporate scandals attract media attention that can be critical in forming the public's perception on the corporation's ESG activities and scores [47–49] and also place the firm under the investors' attention [50].

The resulting damaging exposure can adversely affect corporate reputation [51,52] and also negatively impact investors and the wellbeing of other stakeholders [14,53,54]. For example, Krüger [14] studied how the stock market processes negative information regarding a firm's stakeholder policies and found that investors have strong negative responses to unfavorable ESG news. Oikonomou et al. [53] found that corporate misbehavior increases a firm's financial risk.

Therefore, information on bribery, tax evasion, fraud, and abusive working conditions represents an economic shock that usually comes as a surprise and that can be used as a quasi-experiment to detect the reliability of ESG assessments. If rating agencies are effective at valuing corporate strategies and policies on ESG issues, they are unlikely to downwardly adjust a firm's ESG score after a scandal becomes public news [12]. In other words, ESG raters contribute to the reputation of the firm before misconduct is detected and a reliable assessment reveals that the firm can adjust its policies and strategies to overcome the adverse impact of bad news, restoring their reputation [12,55]. Therefore, we propose the following hypothesis:

**Hypothesis 1 (H1).** *After a scandal has become public news, the ESG scores do not decrease.*

In addition, a company that has its reporting audited by a third party who scrutinizes its policies and strategies is likely to experience less or no downward adjustments of its ESG scores at the unveiling of corporate scandals. In other words, stakeholders tend to hold a company less responsible for a scandal when it has more reliable ratings because underlying information is of better quality. This allows us to state the following hypothesis:

**Hypothesis 2 (H2).** *After a scandal has become public news, the ESG scores of companies whose reports are audited do not decrease.*

### 3. Data and Methodology

#### 3.1. The Sample

To test our assumptions, we collected a database combining different data sources. From Lexis–Nexis, we derived information about corporate scandals of listed companies. We relied on Thomson–Eikon for information on ESG scores and Datastream/Worldscope for companies' financial data.

Thomson–Eikon, which has provided ESG ratings for more than 5000 listed companies since 2002, is a data provider that has been used in previous literature: e.g., [12,13,56–59]. ESG assessments are based mainly on three publicly available sources: ESG reports of the company, non-governmental organizations' (NGO) website, and reliable media channels. A total of 750 data points for ESG aspects were grouped into 18 categories. From each category, the ESG score ranged from 0 to 100, where the higher score was associated with the higher level of firm sustainability.

According to previous literature [47], corporate scandals can be defined as widely publicized incidents involving allegations of managerial wrongdoing or the unethical behavior of one or more members of the company. In Lexis–Nexis, we searched for news on corporate scandals and required that each company accused of wrongdoing was rated by Thomson–Eikon. The first scandal that matched with the ESG score occurred in 2007, so our sample extended over the period of 2007–2017 and consisted of 71 scandals in 54 companies. Corporate scandals can be grouped into four main categories: ecological disasters, human rights abuse, product recall, and corporate crime [12]. Ecological disasters are related to the environmental sustainability of the company (E), human rights abuse and product recall to the social sustainability of the company (S), and, lastly, corporate crime is usually connected to the corporate governance (G). Table 1 shows the list of 71 scandals involving 54 listed companies for the period 2007–2017.

Table 1. List of Scandals.

Company	Country	Year	Description
Apple	US	2010	Abusive working conditions
Apple	US	2012	Child labor
Apple	US	2013	Child labor
Apple	US	2016	Child labor and abusive working conditions
Apple	US	2017	Batterygate
BAE Systems	UK	2007	Bribery
BAE Systems	UK	2009	Bribery
Barclays	UK	2012	Libor manipulation
BASF	DE	2016	Aggressive tax strategies (tax avoidance)
Baxter	US	2007	Child labor
Bilfinger Berger	DE	2015	Bribery
Boeing	US	2017	Falsifying inspection data
BP	UK	2010	Oil spill
Chevron	US	2011	Oil spill
Citigroup	US	2012	Libor manipulation
Credit Suisse	CH	2012	Libor manipulation
Credit Suisse	CH	2012	Tax evasion
Credit Suisse	CH	2014	Tax evasion
Credit Suisse	CH	2017	Tax evasion and money laundering
Daimler	DE	2010	Bribery
Deutsche Bank	DE	2012	Libor manipulation
Deutsche Bank	DE	2012	Tax evasion, trading of emissions certificates
EDF	FR	2008	Oil spill
EDF	FR	2009	Spying on Greenpeace
Exxon	US	2013	Oil spill
Foxconn	TW	2010	Abusive working conditions
Foxconn	TW	2012	Child labor
GAP	US	2007	Child labor
General Motors	US	2014	Recall, safety problems
Glaxosmithkline	UK	2012	Aggressive marketing and the selective use of data
Glaxosmithkline	UK	2013	Bribery of doctors to prescribe drugs
Honda	JP	2017	Falsifying inspection data
HP	US	2010	Abusive working conditions
HSBC	UK	2012	Libor manipulation
IHI	JP	2017	Falsifying inspection data
JP Morgan	US	2012	Libor manipulation
JP Morgan	US	2012	Deception of risks of high derivatives
Kobe Steel	JP	2017	Falsifying inspection data
Lloyds	UK	2012	Libor manipulation
MAN	DE	2009	Failing to prevent bribery
Mattel	US	2007	Tox recall, toxic paint
Mazda	JP	2017	Falsifying inspection data
Microsoft	US	2010	Child labor and bad working conditions
Mitsubishi H. Industries	JP	2017	Falsifying inspection data
Nestle	CH	2007	Chinese milk scandal
Nissan	JP	2017	Falsifying inspection data
Novartis	CH	2014	Illegal marketing practices
Olympus Corporation	JP	2011	Fraud
Pegatron	TW	2013	Abusive working conditions
Pfizer	US	2007	Unauthorized drug testing on children in Nigeria
Philip Morris	US	2010	Abusive working conditions
RBS	UK	2012	Libor manipulation
Samsung	KR	2012	Child labor and abusive working conditions
Samsung	KR	2016	Recall, product safety
Societe Generale	FR	2008	Fraud
Societe Generale	FR	2012	Libor manipulation

Table 1. Cont.

Company	Country	Year	Description
Subaru	JP	2017	Falsifying inspection data
Telia Company	SE	2012	Corruption
Tokyo Electric Power	JP	2011	Nuclear disaster
Toyota	JP	2009	Recall, unintended acceleration problem
Toyota	JP	2017	Falsifying inspection data
Transocean	CH	2010	Oil spill
Transocean	CH	2011	Oil spill
UBS	CH	2009	Tax evasion
UBS	CH	2012	Libor manipulation
Unilever	UK	2007	Chinese milk scandal
Vale	BR	2015	Oil spill
Volkswagen	DE	2015	Dieselgate
Walmart	US	2012	Hindered safety effort
Walmart	US	2012	Bribery
Wells Fargo	US	2012	Fraud
Wells Fargo	US	2016	Fraud

After the corporate scandal identification, we derived companies' ESG and financial data in an event window from the year before and the year after the scandal. The final sample consisted of 71 scandals in 54 companies with complete ESG and financial information.

Distinguishing by industry, 17 scandals were related to the financial industry (24%), 12 to the automotive (17%), five to the oil and gas industry (7%), five to the chemical industry (7%), and 32 to other industry sectors (45%). As for the country of origin, 21 scandals involved US companies (30%), 13 Japanese companies (18%), 12 UK companies (17%), nine Swiss companies (13%), six German companies (8%), four French companies (6%), two Taiwanese companies (3%), two Korean companies (3%), and one Brazilian company (1%). The majority of these scandals occurred in 2012 (17, 24% of the total), 11 in 2017 (15%), and seven in 2010 and 2009 (10%).

We also considered the scores related to the E/S/G pillars, collecting them for each company of our dataset. Table 2 displays the distribution of scandals by industry and ESG pillar. This table shows the scandal distribution by industry and ESG pillar.

Table 2. Descriptive statistics.

Industry	Environmental	Social	Governance
Automotive	3	21	8
Chemical	4	1	0
Oil and Gas	1	4	1
Financial	0	11	8
Others	0	4	6
Total	8	40	23
%	11.27%	56.34%	32.39%

A total of 40 scandals were related to social issues (S), 23 to governance problems, and eight to environmental issues.

Thomson–Eikon also provided information about the controversies. The controversy score reflected the media coverage of past negative events that gave a firm the investors' attention [50]. This kind of news damages firms' reputation and raises questions about future profitability, thus, increasing the riskiness of the business. ESG controversies were classified into 31 categories that have been recoded into the ESG traditional pillars. For example, environmental controversies involved spills and pollution or biodiversity. Social controversies were related to child labor, product quality, and health and safety. Governance controversies arose because of bribery, insider dealings, or excess compensation. Given its



impact of the market value of the company [13], controversies played a key role in assessing firms' sustainability. Thomson–Eikon provided an ESG combined score that incorporated the impact of controversies on the ESG Score. We collected the ESG combined score for the companies of our database.

Furthermore, Thomson–Eikon disclosed information about the presence of an external auditor for each ESG report release. Thus, we checked if the internal source of ESG data had been audited or not and added this information to our database.

Lastly, we derived the financial variables of the companies from Worldscope. Table 3 contains a description of these variables.

**Table 3.** List of Controls.

Variable	Description
Size	Natural logarithm of total assets (WC02999)
Leverage	Total debt (WC03255) divided by total assets (WC02999)
Return on Assets	Return on assets (WC08326)
Book to Market ratio (BTM)	Common shareholders' equity (WC03501) divided by market value of equity (MV)

The control variables used in the paper are described in this table. The source is Datastream/Worldscope and mnemonics are in parentheses.

### 3.2. Descriptive Statistics

Looking at the financial data for the year of the scandal, the companies of our sample were large cap, with an average leverage level of 25%, an average profitability (ROA) of around 5%, and an average book-to-market ratio of 0.89. Panel B of Table 4 displays these data.

**Table 4.** Descriptive statistics.

Variable	Obs.	Mean	Rating	Std. Dev.	Min	Max
<i>Panel A</i>						
ESG Score	71	73.33	B+	12.54	11.44	91.54
ESG Combined Score	71	43.37	C+	12.11	7.16	82.68
E	71	76.79	A–	15.08	8.97	97.28
S	71	76.05	A–	16.16	6.59	95.29
G	71	66.30	B	17.31	19.85	92.16
<i>Panel B</i>						
Size	71	18.56		16.70	14.90	21.42
Leverage	71	0.2471		0.1380	–	0.6237
ROA	71	0.0525		0.0754	–0.1482	0.2304
BTM	71	0.8944		0.8354	0.0330	5.2982

ESG scores at time *t* (the year of the scandal) are summarized in Panel A of the table. Firm size, leverage, ROA, and book-to-market were the same as those defined in Table 3. These financial variables at time *t* (the year of the scandal) are summarized in Panel B of the table.

Summarizing the ESG scores, these companies showed an average ESG Score of 73.35 over 100 and an ESG combined score of 45.47. The impact of the controversies was severe given the wedge between the two scores. Looking at each ESG pillar, these companies showed, on average, a good performance on E (77.41) and S (76.38) and a moderate result on G (65.28).

We considered the ESG scores before and after the scandal in order to check if significant adjustment occurred after the unveiling of a corporate wrongdoing. As Utz [12] pointed out, a good quality ESG assessment implied non-significant rating adjustments after a scandal. In line with Utz [12], we found

a strong positive autocorrelation of the ESG scores of our sample (0.82), so the ESG score at time (t-1) could be considered as the expected ESG score at time (t).

$$ESG_{t,i} = ESG_{t-1,i} + \varepsilon_i \quad (1)$$

Equation (1) means that for each company  $i$ , the difference between two consecutive ESG scores is quantifiable in an error term  $\varepsilon_i$ . We tested if this error term was significantly different from zero. The results are shown in Table 5.

**Table 5.** Descriptive statistics.

Variable	Obs.	Mean	Std. Err.	Std. Dev.
Δ ESG Score	71	0.1214	0.9554	8.0450
Δ ESG Combined Score	71	-1.1422	1.5086	12.7117
Δ E	71	0.6464	1.3644	11.4970
Δ S	71	-0.4280	1.2785	10.7726
Δ G	71	0.1812	1.1882	10.0122

The table summarizes the differences between ESG rating at time t (the year of the scandal) with respect to the previous ESG rating at time (t-1), the year before the scandal.

The results showed no statistically significant difference between the ESG scores before and after the scandals. This confirmed our first hypothesis and revealed the good quality of ESG assessments for the companies in our sample, but if we distinguished between companies with an audited ESG report and companies without an audited ESG report, we obtained important differences. Table 6 summarizes these results.

**Table 6.** Descriptive statistics.

	Non-Audit		Audit		Differences
	Obs.	Mean	Obs.	Mean	Mean
Δ ESG Score	21	-1.6243	50	0.8528	-2.4771
Δ ESG Combined Score	21	-5.5500 **	50	0.7090	-6.2590 **
Δ E	21	-0.4000	50	1.0860	-1.4860
Δ S	21	-3.3528 *	50	0.8004	-4.1532 *
Δ G	21	-1.0047	50	0.6794	-1.6841

The table summarizes the differences (Δ) between ESG scores at year t (the year of the scandal) with respect to the previous ESG rating at year t-1 (the year before the scandal) distinguishing between companies with an audit on ESG reports vs. companies without an audit on ESG reports. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels, respectively.

Companies without an audited ESG report showed a significant decrease of the ESG combined score and S score. Moreover, the difference in the differences between the two groups of companies was statistically significant both for the ESG combined score and S score. We argued that the quality of the ESG assessment was significantly higher for companies that involved an external auditor in the ESG report process because these firms showed no significant adjustment after the scandal, in line with our second hypothesis. This effect is particularly important for the ESG combined score, which was more sensitive to controversies, and for the S score, since 56% of the scandals (40 over 71) were related to social issues.



### 3.3. The Model

To check whether ESG score adjustment was related to the audit of the ESG report, we controlled for several factors. We ran the following regression models:

$$1. \Delta ESG Score_{t,i} = \beta_0 + \beta_1 Audit_{t-1,i} + \beta_2 Size_{t,i} + \beta_3 Leverage_{t,i} + \beta_4 ROA_{t,i} + \beta_5 BTM_{t,i} + Industry\ dummies + Country\ dummies + Year\ dummies + \varepsilon_{i,t}$$

$$2. \Delta ESG Combined\ Score_{t,i} = \beta_0 + \beta_1 Audit_{t-1,i} + \beta_2 Size_{t,i} + \beta_3 Leverage_{t,i} + \beta_4 ROA_{t,i} + \beta_5 BTM_{t,i} + Industry\ dummies + Country\ dummies + Year\ dummies + \varepsilon_{i,t}$$

where:  $\Delta ESG_{t,i}$  is the difference between ESG scores of the company  $i$  at year  $t$  (the year of the scandal) with respect to the previous ESG score at year  $t-1$ ; audit is a dummy variable that takes value 1 if the ESG report of the company has been audited by an external reviewer, 0 otherwise; size is the natural logarithm of total assets; leverage is the total financial debt divided by total assets; ROA is the EBITDA divided by total assets; BTM is the book-to-market ratio.

We ran ordinary least square (OLS) regressions both for  $\Delta ESG_{t,i}$  Score and for  $\Delta ESG_{t,i}$  Combined Score as dependent variables. Table 7 shows the main results.

**Table 7.**  $\Delta$  ESG regressions.

	(1)	(2)
Audit	4.1168 *** [1.7825]	8.5500 *** [4.1889]
Size	-1.1188 [1.3804]	-2.1253 [2.4946]
Leverage	-0.6486 [0.8280]	-0.2801 [1.5090]
ROA	-0.1449 [0.2838]	-0.5596 [0.4475]
BTM	-0.6729 *** [0.2598]	-0.7500 ** [0.3796]
Adjusted R-squared	0.6338	0.4356
Observations	71	71

OLS regressions with  $\Delta$  ESG score as the dependent variable in model (1) and  $\Delta$  ESG combined score as the dependent variable in model (2). Audit was a dummy variable that took value = 1 if the ESG report of the company was audited by an external reviewer, and zero otherwise. Firm size, leverage, ROA, and book-to-market were the same as defined in Table 3. The year, country, and industry fixed effects were included. Standard errors (in brackets) were clustered by firm. \*\*\*, \*\*, and \* indicated significance at the 1, 5, and 10 percent levels, respectively.

Audit showed a positive and statistically significant coefficient for both models (1) and (2). When a scandal occurred, the change of ESG scores was positively associated with the presence of an audited ESG report. Since this report represented one of the main components of the ESG assessment made by nonfinancial analysts, it implies that a good quality ESG assessment helps in mitigating the negative effects of a scandal.

BTM had a negative and statistically significant coefficient for both models (1) and (2). Companies traded at a discount with respect to the book value obtained a significant decrease in ESG scores when a scandal occurred.

We also ran three different OLS regressions for each E/S/G score:

$$3. \Delta E_{t,i} = \beta_0 + \beta_1 \text{Audit}_{t-1,i} + \beta_2 \text{Size}_{t,i} + \beta_3 \text{Leverage}_{t,i} + \beta_4 \text{ROA}_{t,i} + \beta_5 \text{BTM}_{t,i} + \text{Industry dummies} + \text{Country dummies} + \text{Year dummies} + \varepsilon_{i,t}$$

$$4. \Delta S_{t,i} = \beta_0 + \beta_1 \text{Audit}_{t-1,i} + \beta_2 \text{Size}_{t,i} + \beta_3 \text{Leverage}_{t,i} + \beta_4 \text{ROA}_{t,i} + \beta_5 \text{BTM}_{t,i} + \text{Industry dummies} + \text{Country dummies} + \text{Year dummies} + \varepsilon_{i,t}$$

$$5. \Delta G_{t,i} = \beta_0 + \beta_1 \text{Audit}_{t-1,i} + \beta_2 \text{Size}_{t,i} + \beta_3 \text{Leverage}_{t,i} + \beta_4 \text{ROA}_{t,i} + \beta_5 \text{BTM}_{t,i} + \text{Industry dummies} + \text{Country dummies} + \text{Year dummies} + \varepsilon_{i,t}$$

The results are shown in Table 8.

**Table 8.**  $\Delta$  E/S/G regressions.

	(3)	(4)	(5)
Audit	2.6082 [2.8814]	5.2170 ** [2.6114]	4.5252 [3.0417]
Size	−1.9026 [2.3582]	−0.8223 [1.7392]	−0.5835 [1.6980]
Leverage	−0.2554 [0.1324]	−0.9722 [1.1420]	−1.0510 [0.8812]
ROA	−0.3025 [0.3799]	−0.1593 [0.3426]	0.0417 [0.3457]
BTM	−0.6312 ** [0.3082]	−0.7558 [0.4617]	−0.6205 ** [0.1986]
Adjusted R-squared	0.4224	0.5994	0.4899
Observations	71	71	71

OLS regressions with  $\Delta$  E score as the dependent variable in model (3),  $\Delta$  S score as the dependent variable in model (4), and  $\Delta$  G score as the dependent variable in model (5). Audit was a dummy variable that took value = 1 if the ESG report of the company was audited by an external reviewer, and zero otherwise. Firm size, leverage, ROA, and book-to-market were the same as defined in Table 2. Year, country, and industry fixed effects were included. Standard errors (in brackets) were clustered by firm. \*\*\*, \*\*, and \* indicated significance at the 1, 5, and 10 percent levels, respectively.

Audit had a positive and statistically significant coefficient in model (4). This result was expected, because the majority of corporate scandals are related to the social pillar (40 over 71). BTM confirmed its negative impact for both models (3) and (5).

#### 4. Discussion of the Results

Assessing the sustainability of a company is a complicated task. ESG rating agencies have often been criticized because of their methodology [33,34]. There are several controversial issues that relate to the complexity of the term sustainability, the choice of criteria, their measurement using scores, and how to judge whether the criteria have been met [25]. A lack of attention is given to the accuracy, transparency, and reliability of the information that is at the basis of the scores. The ESG report issued by a company is the primary source of rating agencies' information. Its quality is crucial for an accurate ESG assessment, but non-financial reporting has not reached standardized forms at an international level [36] and mandatory reporting is still lacking. This problem is particularly severe given the possible misleading behavior of companies that could be tempted to issue false ESG information to the public (i.e., green-washing or social-washing phenomenon) [38–40].

The information asymmetry between companies and market participants could be mitigated by the presence of an external auditor on the ESG report. Companies are already seeking external expertise to verify their sustainability data voluntarily and the number of these requests raises year after year. We measured how valuable the auditing of ESG reports is, looking at the ESG scores before and after

a corporate scandal. Using this shock as a quasi-natural experiment, we observed that companies with audited ESG reports experience no drop in ESG scores. The auditing process increases the quality of the ESG assessment. ESG scores can be used by market participants as an information that incorporates all relevant information about the sustainability of the company. When the ESG report is not submitted to an external audit, there is a significant change in the ESG scores. This implies that the information content of the score is not complete and does not incorporate all relevant ESG information.

Without an audit on the ESG report, we documented a drop both in the ESG score and ESG combined score. This fact means that when an ESG score is obtained using a low-quality source of data, checking for the controversies is not enough to mitigate the lack of information content.

Looking at the E/S/G scores, the pillar S benefits more of the auditing process. There are several reasons for that. First of all, the majority of the scandals are related either to human rights abuse or to product recall, thus, belonging to the S pillar of sustainability. Second, the S pillar is more complicated to analyze compared to the other pillars—mainly due to environmental factors. The “E” factor has several important features: it is easier to measure; environmental protection and climate change take a central stage in societal debate; policymakers and regulators address environmental issues more clearly. The social factor, instead, is under-investigated: it is more difficult to measure; it could be politically divisive; it is more complicated for policymakers and regulators to issue the recommendation on “S.” The importance of an external audit on an ESG report has a significant impact on S, because it helps to mitigate the measurement difficulties.

The policy implications of our findings are mainly two. First, we demonstrated the importance of an external audit on companies’ ESG report. Second, pillar S needs a clearer definition following the international efforts about the taxonomy of pillar E. Increasing the quality of data has key implications for rating agencies, but also for investors, companies, and researchers. These actions are necessary to improve the information content of ESG scores.

## 5. Robustness Checks

We performed two different tests in order to confirm our results. First, since the dependent variables of our models had a limited range from (−100, +100), we ran Tobit regressions to check the consistency of the results. Tables 9 and 10 summarize the Tobit regression results.

Tobit regressions with  $\Delta$  ESG score as dependent variable in model (1) and  $\Delta$  ESG combined score as dependent variable in model (2). Audit is a dummy variable that takes value = 1 if the ESG report of the company is audited by an external reviewer, and zero otherwise. Firm size, leverage, ROA, and book-to-market are the same as defined in Table 3. Year, country, and industry fixed effects are included. Standard errors (in brackets) are clustered by firm. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels, respectively.

Table 9.  $\Delta$  ESG regressions.

	(1)	(2)
Audit	4.2051 *** [1.3994]	8.7653 *** [3.1524]
Size	−1.1613 [1.0463]	−2.2289 [1.7856]
Leverage	−0.6492 [0.6583]	−0.2827 [1.5394]
ROA	−0.1481 [0.2241]	−0.5773 [0.3501]
BTM	−0.6991 *** [0.2102]	−0.8137 ** [0.32934]
Pseudo R-squared	0.1469	0.0741
Observations	71	71

**Table 10.**  $\Delta$  E/S/G regressions.

	(3)	(4)	(5)
Audit	2.8186 [2.2874]	5.3227 *** [2.0396]	4.5568 [2.3473]
Size	−1.9026 [2.004]	−0.8731 [1.3041]	−0.6393 [1.2684]
Leverage	−0.2411 [0.9942]	−0.9722 [0.8968]	−1.0422 [0.6969]
ROA	−0.3100 [0.2898]	−0.1631 [0.2654]	0.0570 [0.2973]
BTM	−0.6935 ** [0.3082]	−0.7872 *** [0.3701]	−0.6116 ** [0.1479]
Pseudo R-squared	0.0759	0.1226	0.0905
Observations	71	71	71

Tobit regressions with  $\Delta$  E score as the dependent variable in model (3),  $\Delta$  S score as the dependent variable in model (4), and  $\Delta$  G score as the dependent variable in model (5). Audit is a dummy variable that takes value = 1 if the ESG report of the company is audited by an external reviewer, or zero otherwise. Firm size, leverage, ROA, and book-to-market are the same as defined in Table 2. Year, country, and industry fixed effects are included. Standard errors (in brackets) are clustered by firm. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels, respectively.

The Tobit regressions substantially confirmed the findings we obtained from the baseline models. Audit played an important role in mitigating scandals' effect on ESG score differences. Looking at the E/S/G pillars, the Tobit regressions confirmed that changes in S score were positively related to the audit variable. BTM confirmed its negative impact for all the models.

Secondly, we checked if the identity of the auditors played a role in explaining the quality of the assessment. In fact, we had two different kinds of external reviewers: consulting companies with sustainability expertise (i.e., KPMG, Ernst & Young, Deloitte, PricewaterhouseCoopers) and specialized auditors. On one hand, we expected that consulting companies with a comprehensive expertise in both the financial and non-financial field could provide audit services on ESG reports of higher quality; on the other hand, specialized auditors could dig more on non-financial issues, thus, providing a more reliable ESG report assessment.

In unreported regressions, we ran both OLS and Tobit models, considering an interaction variable between audit and specialized auditor variables and we did not find evidence of any differences between the two groups of auditors.

## 6. Conclusions

There is a large and growing interest in non-financial information by market participants, and rating agencies play a major role in assessing the sustainability performance of companies. They analyze and scrutinize a vast amount of information that ranges from questionnaires to news released by media channels. However, the primary source of information is company reporting.

ESG disclosure is on a voluntary basis. Despite a few initiatives aiming at harmonizing reporting standards (like the Global Reporting Initiative's (GRI) Sustainability Reporting Guidelines or the non-financial reporting EU directive), ESG disclosure practices are still subject to variation across firms. Advocates of the standardization of sustainability disclosure argue that standards would bring consistency to reporting and allow the comparison of company ESG performance, at least within sectors. In the absence of this, companies can rely on audit services by external parties to provide independent assurance that their sustainability reporting is fairly presented.

We relied on the ESG scores released by Thomson–Eikon, a data provider who also has information about the recourse to auditing practices for non-financial information. Using data on 71 corporate

scandals that occurred from 2007 to 2017, we were able to provide evidence on the reliability of ESG scores.

We found that the change in the ESG score before and after a scandal was not significantly affected by the bad event. However, when we split the sample between audited and non-audited non-financial statements, we detected that the change in ESG rating was significantly negatively affected by the controversies only for unaudited reporting. Companies whose report had been audited by external parties did not exhibit a significant worsening in their rating. The evidence was also confirmed in a multivariate analysis, where we controlled for firm-specific characteristics.

Therefore, rating agencies provide accurate measures of companies' sustainability when the underlying non-financial information is audited. Third-party assurance about the quality of ESG reporting is thus valuable to investors and other stakeholders who rely on the ESG rating for their decision making. Our analysis has policy implications, as it adds to the ongoing debate on the ESG reporting practices and their influence on the quality of companies' non-financial information. In fact, regulator efforts are significant in this direction. The Directive 2014/95/EU requires the member states of the European Union to ensure that the statutory auditor checks for the presence of the information but does not require an audit of non-financial information. The statutory auditor is not required to issue an assurance opinion on the non-financial information disclosed, but only a consistency check. The efforts of the European Commission on this field are very important, and in its guidelines on non-financial disclosure, it is stated that independent external assurance can be seen as a way to make information "clearer and accurate." Our findings go in this direction and document that third-party external verification enhances the reliability of non-financial reporting, helping to bridge the credibility gap between the company and the market about sustainability reporting.

## 7. Limitations

Thomson–Eikon is an important source of data for this paper for several reasons. First, it provides both the ESG score and ESG combined score, considering the role of controversies in the sustainability assessment; second, it covers different markets, allowing researchers to build an international dataset; third, the ESG scores range from zero to 100, giving the dependent variables a minimum level of variability, which allows us to make some inferences. Nevertheless, ESG data have some limitations. ESG scores are disclosed on a yearly basis, while a more accurate measure of the impact of a scandal could be better captured with more granularity of the time series (monthly). ESG data goes back to 2002, while several important scandals occur before that date (i.e., Exxon Valdez, 1989; Enron, 2001). We could use another ESG source of data to integrate our database, such as MSCI, which has a longer time series, but different ESG providers use different methodologies in analyzing companies' sustainability, so we could have a problem with the comparability of data from different sources.

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