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Association between Earnings Announcement Behaviors and ESG Performances

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Abstract: Despite the rapidly growing interest in ESG business management, it is not easily attainable for stakeholders to accurately assess the quality of the ESG activities of a firm due to several problems, including the exaggeration or greenwashing of the real ESG performance. This study investigates whether managerial opportunism, as revealed by earnings announcement behaviors, can be utilized as a hallmark to forecast the quality of ESG performance. Based on the tests using Korean firms, the empirical results show that opportunistic behaviors for earnings announcement announcements, such as the announcement on Friday, after market closing, and omitting preliminary earnings disclosure, are all negatively associated with the ESG performance score on an individual and also collective basis. Further analysis shows that firms with opportunistic strategies for earnings announcement tend to miss the disclosure on ESG activities as well. In sum, this study contributes to future research and policy-making by suggesting a new practical approach to analyzing the earnings announcement behaviors as a quick test to verify the corporate ESG performance.

Keywords: ESG performance; social responsibility; management opportunism; earnings announcement; disclosure quality

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1. Introduction

ESG (Environment, Social, Governance) management can be defined as a business process that firms use to realize various social values, including sustainable investment, social responsibility, environmental protection, and risk management in their business operation. ESG management contributes to increasing corporate sustainability and its financial performance by taking into account the social and environmental issues in every course of business operation [1–3].

The importance of ESG for business entities has been highlighted, especially since investors and other stakeholders show increasing interest in ESG-based investment [4]. As more investors consider the corporate responsibility for ESG seriously in their investment decision-making, assessment of the corporate ESG performance has become more important for firms and their investors as well. Conventional belief is that financial or accounting disclosure is a key source of information on which investors rely in their decision-making. However, the rapidly increasing interest in ESG investment highlights the importance of accurate information on a firm's ESG activities. This trend can be noticed by the fact that major institutions in many countries provide guidelines for ESG performance reporting, and an increasing number of firms have released reports on their ESG-related activities and outcomes.

In spite of the growing presence of ESG reporting, critics point out several challenges with the current practice of ESG information disclosure. Basically, ESG reporting is made at a firm's own discretion, and there is no standardized set of rules for the disclosure, unlike financial information disclosure under the generally accepted accounting principle. Another downside is that ESG issues are often hard to identify and measure their impact

on business, which is challenging for companies to determine the scope and content of ESG description. The aforementioned aspects could compromise the understandability and comparability of ESG reporting for stakeholders. Additionally, the quality of ESG information can vary widely across firms, and some companies may not provide accurate or comprehensive information in their ESG disclosures, which can make it difficult for stakeholders to assess their true performance. Furthermore, the underlying data relating to the ESG report can be difficult to verify its accuracy, which can decrease the reliability and verifiability of ESG disclosure.

Considering the limitations inherent to ESG reporting, critics suspect that companies can make exaggerated or false claims about the environmental or social benefits of their products or services in the ESG disclosure, which is referred to as the "greenwashing" practice. Companies may be tempted to make exaggerated claims about their ESG performance that is misleading or not supported by evidence, which can eventually make it more difficult for investors to make informed decisions. In this connection, researchers suggest that there has been a growing concern about ESG greenwashing as a significant impediment to proper ESG investment, and effective measures to deter opportunistic greenwashing should be taken in action [5,6].

To address this problem, it is important for investors and consumers to be critical and cautious when interpreting ESG information, not merely relying on the target firm's ESG report at its face value. Institutional improvements such as adopting standardized reporting frameworks and seeking independent, third-party verification of ESG claims should be introduced on a long-term basis. However, it would be unrealistic for individual investors to apply such a fundamental solution on their own to the ESG investment. Thus, it would be useful if investors could find a simplified hallmark indicative of ESG performance level as an alternative to the annual ESG report, which is prone to opportunistic manipulation and usually becomes available on a delayed basis.

In this connection, arguably, financial reporting quality is closely associated with ESG performance since the corporate governance system critical for a firm's decision-making process can substantially affect both the ESG performance and the financial disclosure in common [2,7–13]. Thus, a company with highly-developed ESG management is also expected to have well-organized corporate governance as a key component of ESG in itself and therefore show high-quality earnings disclosure as well. This conjecture is also supported by empirical evidence. Velte (2019) [3] shows that ESG performance is negatively connected with accrual-based earnings management, which suggests that firms with improved ESG performance have better accounting quality.

Considering the above, this study purports to search for the connection between the ESG outcome and the financial reporting quality. More specifically, we aim to find the signal of managerial opportunism in financial earnings disclosure, which could be applied to evaluate the level of ESG performance. In this regard, corporate behavior for earnings announcements can be an indicator of the extent of managerial opportunism relating to information disclosure. Previous research suggests that firm managers may act opportunistically in earnings announcements to manipulate the market reaction in their favor for various reasons, including job security, better compensation, and reducing litigation risk [14–17]. Empirical evidence consistently shows that managerial opportunism is related to certain specific patterns of earnings announcement behaviors, such as releasing bad earnings news when the market attention is relatively low, for example, announcement on Friday or after market closing, and omitting preliminary earnings announcement [14,18,19].

This suggests a practical implication that investors and other stakeholders can utilize the behavioral patterns in earnings announcements as a simplified method of detecting management's opportunistic motivation regarding corporate information disclosure. It is a natural conjecture that ESG reporting, as a form of voluntary information disclosure, is highly likely to be affected by managerial opportunism, for example, greenwashing, as aforementioned. Further, opportunistic behavior in corporate disclosure is in itself indicative of a weakness in corporate governance, which plays a critical role in communi-

cating with stakeholders through a reliable source of information. Considering the above comprehensively, we predict that managerial opportunism detected by earnings announcement behaviors is negatively associated with the ESG performance that is rated by an independent institution. In short, the empirical test results using Korean firms in this study are consistent with the hypothesis and demonstrate that firms with opportunistic earnings announcement strategies have a relatively lower score for their ESG performance evaluation.

This study provides practical implications and contributes to future research in several ways. First, our study presents a new research idea that earnings disclosure can also be analyzed for the purpose of interpreting corporate performance regarding the ESG agenda, which has grown exponentially in the recent business environment. Second, our empirical test results provide solid evidence that opportunistic behaviors in earnings announcements are negatively associated with the quality of ESG performance. The findings suggest a practical application that ESG investors and related stakeholders can observe the earnings announcement patterns as a convenient and heuristic method of assessing a firm's ESG performance instead of analyzing the firm's ESG report on their own, which is difficult to understand and vulnerable to greenwashing. Further, this study provides implications for policy-makers as well in the meaning that managerial opportunism can significantly affect the reliability of ESG reports, and proper policy measures should be implemented in a timely manner to reduce excessive manager's discretion in preparing ESG reports and thus enhance their verifiability and comparability.

The remaining parts of this paper proceed as follows: Section 2 reviews the previous research and presents our research hypotheses. Section 3 explains the research model adopted for empirical tests in this study and the composition of sample observations. Section 4 provides the main empirical test results, and Section 5 conducts additional analysis. Finally, Section 6 concludes the paper.

2. Literature Review and Research Hypotheses

2.1. ESG Performance and Managerial Opportunism

Previous research generally shows that corporate ESG activities are associated with firm performance and firm value. Although the ESG activity may lead to an increase in a firm's cost [20], firms can enhance their reputation through ESG disclosure in the capital market and induce investment in the firm [4]. In addition, ESG activities enable the firm to build a positive relationship with its stakeholders and increase the interests of stakeholders, therefore resulting in improving the firm's financial performance [1,21,22].

Despite the potential benefit of a firm's ESG activities, critics argue that firms can obscure their poor ESG performance by overstating or distorting the ESG-related information delivered to stakeholders, which is referred to as "greenwashing" [5,6]. More importantly, relevant studies indicate that managerial opportunism focusing on short-term interest is likely to have a negative association with the firm's true ESG performance. As an example, Lin et al. (2021) [23] provide similar findings that firms with stronger short-term incentives for CEOs have lower levels of ESG performance. By the same token, researchers report that the level of involvement of long-term investors is positively related to the ESG scores [24,25].

In this regard, it is reported that the role of corporate governance is important to reduce a firm manager's opportunistic behavior and to raise the effectiveness of ESG activities. Several studies suggest that ESG performance can be enhanced by well-governed managerial decisions and good governance structure, including CEO and board characteristics. For example, firms with female or married CEOs have higher levels of ESG scores [2,7]. In addition, Chen et al. (2020) [8] provide that ESG activities increase in firms with higher levels of institutional ownership. Further, the increased portion of independent directors in the board composition can contribute to enhancing the disclosure of corporate social responsibility [26]. Similarly, a company's carbon disclosure quality is positively associated with its board effectiveness [27]. These results are consistent with the theory that effective

corporate governance, such as board composition and investor monitoring, can lower agency costs, as many researchers provide [9,12,28].

2.2. Managerial Opportunism Detected by Earnings Announcement Behaviors

As previously suggested, corporate governance is a major factor in restricting managerial opportunism and enhancing the true level of ESG performance. The role of corporate governance is also highlighted in accounting research. In detail, the intensity of corporate governance has a significant association with the quality of corporate disclosure, including earnings announcements and financial reporting. For instance, Salehi et al. (2022) [13] found that corporate governance indicators, including board expertise and audit committee quality, are positively associated with financial reporting transparency. The mechanism underlying the positive relationship between corporate governance and financial reporting quality is suggested by previous research. Lombardo and Pagano (2002) [29] provide that corporate disclosure can contribute to attracting investors' monitoring and understanding firm's performance. Thus, well-informed investors are expected to better detect any potential anomaly in earnings disclosure and therefore reduce firm managers' motivation to manipulate earnings [10,11].

Considering the above in a comprehensive manner, managerial opportunism is likely to be stronger under weaker corporate governance, which potentially undermines the quality of accounting disclosure and ESG performance as well. In this connection, firm behavior in accounting disclosure, especially for earnings announcements, has recently been highlighted as a critical clue to detect the extent of managerial opportunism. It is well known that earnings announcement is the most important event through which firms can communicate with various stakeholders about their financial performances [30]. Accordingly, earnings announcements can have a significant impact on share prices in the stock market and eventually affect the evaluation of firm managers' performance. Thus, many researchers argue that earnings announcement is a useful event to reveal firm managers' opportunistic motivation. Firm managers may be tempted to manipulate market reaction to the earnings announcement in favor of the manager's self-interest. Such motivation of firm managers can be related to seeking a positive reputation to achieve better career success, including higher compensation and promotion [14,17]. Also, firm managers may adopt opportunistic strategies to hide bad earnings news in an attempt to reduce the likelihood of shareholder litigation and job security [15,16].

Based on previous research, managerial opportunism in earnings announcements could be reflected in firm choices on the timing and modality of earnings announcements in an attempt to avoid (attract) market attention to bad (good) earnings news. In detail, negative earnings news is more frequently announced on Friday before the weekend than positive earnings news [19,31]. Similarly, firms with bad earnings performance announce earnings news before or after the market open hours more than the other firms [14]. Those regular patterns in earnings announcements support the managerial opportunism hypothesis that firm managers opt to announce bad earnings news when the market is inattentive in order to avoid a sharp decline in stock price subsequent to the earnings shock. Vice versa, firms with positive earnings news may act opportunistically to time the announcement when the market attention is relatively high. In addition, opportunistic firm managers with negative earnings performance may choose to skip the preliminary earnings announcement and delay the announcement until the full financial statement report. This type of opportunistic behavior has been observed in previous empirical research as well [18].

Considering the aforementioned comprehensively, managerial opportunism presumably reflects an insufficient quality of corporate governance and is known to have a negative effect on a firm's ESG performance. Also, the extent of managerial opportunism can be effectively detected by observing the various behavioral patterns in earnings announcements. This strongly suggests a possibility that ESG performance is closely related to transparency in earnings disclosure. Therefore, we predict that the opportunistic behavioral patterns of

earnings announcements are negatively associated with the level of ESG performance and suggest the following hypotheses for each of the earnings announcement patterns.

Hypothesis 1 (H1): *Firms that announce earnings after market closing have a lower score of ESG performance than the other firms.*

Hypothesis 2 (H2): *Firms that announce earnings on Friday have a lower score of ESG performance than the other firms.*

Hypothesis 3 (H3): *Firms with no preliminary earnings announcements have a lower score of ESG performance than the other firms.*

3. Research Design and Sample Selection

3.1. Empirical Models

We adopt ordinary linear regressions ("OLS") to formally test for the research hypotheses using the following regression models:

$$ESG\_S_{it} = \beta_0 + \beta_1 EA_{it} + \beta_2 NP_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 SALES_{it} + \beta_6 TQ_{it} + \beta_7 BIG4_{it} + \beta_8 TRADE_{it} + \beta_9 MSH_{it} + \beta_{10} FSH_{it} + \sum \beta_m YEAR + \sum \beta_n IND + \varepsilon \quad (1)$$

The dependent variable *ESG_S* indicates the scores on ESG performance of sample firms that are provided by the Korea Institute of Corporate Governance and Sustainability. The original evaluation by the institute is ranked in categorical orders such as A+, A, B+, B, C and D, which we further transform into numerical values scaled from 0 to 5 for this study. Thus, the greater value of *ESG_S* is indicative of a higher level of ESG performance evaluation. In detail, for the dependent variable, we use four specific scores of ESG performance for each domain of ESG activities, including *E_S* for the environment, *S_S* for social, *G_S* for governance, and *ESG_S* for total evaluation, respectively.

The main test variable *EA* in the above Formula (1) collectively represents the indicator variables for each type of opportunistic earnings announcement behavior. In detail, *AC* has a value of 1 if a sample firm announces earnings after market closing and 0 otherwise. In a similar way, *FRI* is a dummy variable that has a value of 1 if the firm releases an earnings announcement on Friday, and *NOPREL* indicates firms that omit preliminary earnings announcements. Being consistent with the research hypotheses, we expect the coefficient β_1 on each of the test variables *AC*, *FRI*, and *NOPREL* to have a negative sign.

The other variables are included as controls for firm attributes that could potentially affect the sample firms' ESG performances. *NP*, *SIZE*, *LEV*, and *SALES* are related to basic controls for corporate business volume and financial structure. *NP* stands for net profit as deflated by the market value of equity as of the previous quarter's end, and *SIZE* is measured as the log value of total assets. *LEV* is the total debt-to-asset ratio at fiscal quarter end, and *SALES* is calculated by dividing total sales revenue by total assets for each quarter. *TQ* represents Tobin's Q as a proxy for firm value, which is computed as a ratio of the market value of the equity and total liabilities to the book value of total assets. The other control variables are related to corporate governance and shareholder composition, which can potentially affect firm decisions on ESG management. As such, *BIG4* is a dummy variable indicating a firm hiring one of the four major accounting firms as its financial auditor. *TRADE* indicates the stock trading volume of a firm expressed as the relative decile ranking score between 0 and 1 based on the ratio of the entire stock turnover for a year to the outstanding year-end number of shares. Additionally, *MSH* represents the shareholding ratio of the major shareholder group, and *FSH* indicates the ratio of foreign shareholders, both of which reflect the corporate governance and ownership structure. Further, year and industry-fixed effects are reflected in the regression tests to control for the cross-sectional and time-series differences.

3.2. Samples and Data

We identify initial sample observations from the firms listed in Korean stock markets, including the KOSPI (Korea Composite Stock Price Index) and the KOSDAQ (Korea Securities Dealers Association Automated Quotation). The test period started in 2012 after the completion of the IFRS (International Financial Reporting Standards) adoption in Korea and ended in 2018; until then, the data on earnings announcement timing is available. We collect the accounting data for sample firms using the TS-2000 database and further obtain information on the type, date, and time of earnings announcements from the Korea Exchange. Additionally, the ESG performance scores are provided by the Korea Institute of Corporate Governance and Sustainability, a non-profit organization that conducts independent reviews of ESG reports for Korean firms.

Then, we screened out certain observations that might undermine the test reliability. First, we exclude the firms with non-December year-end to maintain consistency in accounting practice across samples. Further, firms with extreme financial structures in which the capital is fully impaired are rejected, and observations with a missing value for the regression variables are excluded. As a result, the number of finally selected sample observations amounts to 17,370 firm-quarters.

4. Empirical Results

4.1. Descriptive Statistics and Correlations

Table 1 presents the descriptive statistics for the test variables used for the main regression analysis. Among the variables indicative of managerial opportunism in earnings announcements *AC*, *FRI*, and *NOPREL*, *AC* has the mean value of 0.634, which means that over half of the earnings announcements under the sample, observations were made after the market closing. Similarly, the mean value of *FRI* implies that the share of firms releasing earnings news on Friday approximates 30%, while the majority of sample firms do not provide preliminary earnings information before regular earnings announcements, as shown by the mean value of *NOPREL* as 0.72. These results indicate that a substantial portion of sample firms conduct opportunistic strategies for earnings announcements.

Table 1. Descriptive Statistics.

Variable	N	Mean	Std.	Min	25%	Median	75%	Max
AC	17,370	0.634	0.482	0.000	0.000	1.000	1.000	1.000
FRI	17,370	0.301	0.459	0.000	0.000	0.000	1.000	1.000
NOPREL	17,370	0.720	0.449	0.000	0.000	1.000	1.000	1.000
ESG_S	17,370	2.264	0.592	2.000	2.000	2.000	2.000	5.000
E_S	17,370	2.360	0.648	0.000	2.000	2.000	3.000	5.000
S_S	17,370	2.354	0.723	2.000	2.000	2.000	2.000	5.000
G_S	17,370	1.963	0.948	2.000	1.000	2.000	2.000	5.000
NP	17,370	0.006	0.062	−0.334	−0.003	0.013	0.030	0.172
SIZE	17,370	20.238	1.696	17.213	19.062	19.928	21.158	25.292
SALES	17,370	0.281	0.210	0.006	0.157	0.238	0.339	1.291
LEV	17,370	0.450	0.221	0.032	0.270	0.446	0.602	0.929
TQ	17,370	1.163	0.707	0.446	0.800	0.966	1.231	4.979
BIG4	17,370	0.684	0.465	0.000	0.000	1.000	1.000	1.000
TRADE	17,370	0.388	0.293	0.000	0.111	0.333	0.556	1.000
MSH	17,370	0.442	0.167	0.087	0.324	0.445	0.552	0.829
FSH	17,370	0.109	0.141	0.000	0.015	0.050	0.152	0.665

Definitions of variables are provided in the Appendix A.

In relation to the dependent variable on ESG performance, the total ESG score, *ESG_S*, has a mean (median) value of 2.264 (2.0) based on the 0 to 5 scale. The individual ratings for each component of ESG show similar patterns, while the mean value of the corporate governance score, *G_S* (1.963), is slightly lower than the other two categories, like 2.360 for *E_S* and 2.354 for *S_S*. Further, the control variables for basic firm characteristics such

as *SIZE*, *SALES*, and *LEV* have stable distributions, which is shown by the mean (median) value of 20.24 (21.16) for *SIZE*, 0.281 (0.238) for *SALES*, and 0.450 (0.446) for *LEV*. The variable for firm value, *TQ*, slightly exceeds 1 at its mean value, implying that the market value of sample firms is not highly greater than its book value on average. Additionally, the ratio of major shareholders, *MSH*, amounts to 0.442 on average, while the mean value of foreign shareholders ratio as *FSH* is around 0.11.

Table 2 shows the Pearson/Spearman correlations among the main test variables. As for the variables on opportunistic earnings announcements, *AC*, *FRI*, and *NOPREL* are interrelated, showing positive correlations among them. The correlations between the total ESG score, *ESG_S* and the earnings announcement strategies consistently show negative signs, which are statistically significant, while the negative correlation is the strongest between *ESG_S* and *NOPREL*. With regard to the control variables, the firm characteristics such as *NP*, *Size*, and *TQ* are positively correlated with *ESG_S*, which implies that large, profitable, and highly valued firms tend to have higher ESG performance. In addition, the net profit, *NP* has a generally negative correlation with earnings announcement strategies, especially for *AC* (Pearson coef. = −0.137) and *NOPREL* (Pearson coef. = −0.117), which is consistent with the notion that managerial opportunism in a way to avoid market attention increases as firm profitability deteriorates.

Table 2. Correlations among the Variables.

	AC	FRI	NOPREL	ESG_S	NP	SIZE	SALES	LEV	TQ	BIG4	TRADE	MSH	FSH
AC		**0.02**	**0.17**	**−0.03**	**−0.14**	**0.03**	−0.01	**0.06**	**−0.04**	**0.06**	**−0.02**	0.00	**−0.06**
FRI	**0.02**		**0.03**	**−0.04**	0.00	**−0.04**	0.00	**−0.02**	−0.01	**−0.03**	**0.02**	0.00	**−0.02**
NOPREL	**0.17**	**0.03**		**−0.44**	**−0.12**	**−0.48**	0.00	**−0.07**	**−0.13**	**−0.24**	**0.03**	**0.11**	**−0.37**
ESG_S	**−0.03**	**−0.04**	**−0.45**		**0.03**	**0.63**	**−0.02**	**0.15**	**0.02**	**0.28**	**−0.08**	**−0.18**	**0.45**
NP	**−0.14**	0.01	**−0.13**	**0.05**		**0.08**	**0.11**	**−0.18**	−0.01	**0.05**	**−0.10**	**0.07**	**0.11**
SIZE	**0.05**	**−0.05**	**−0.44**	**0.57**	**0.15**		**−0.11**	**0.32**	**−0.11**	**0.45**	**−0.24**	**−0.07**	**0.52**
SALES	**−0.06**	0.01	−0.01	**−0.06**	**0.16**	**−0.10**		**−0.11**	**0.14**	**0.09**	**0.15**	**0.09**	0.00
LEV	**0.06**	**−0.02**	**−0.07**	**0.17**	**−0.12**	**0.28**	**−0.05**		**−0.07**	**0.08**	**0.02**	**−0.09**	**−0.08**
TQ	**−0.05**	−0.01	**−0.18**	**0.07**	**−0.09**	**−0.09**	**0.16**	**0.08**		−0.01	**0.16**	**−0.12**	**0.12**
BIG4	**0.06**	**−0.03**	**−0.24**	**0.30**	**0.10**	**0.48**	**0.11**	**0.08**	**0.03**		**−0.08**	**0.07**	**0.27**
TRADE	**−0.03**	**0.02**	0.01	**−0.07**	**−0.11**	**−0.24**	**0.18**	**0.03**	**0.25**	**−0.05**		**−0.19**	**−0.12**
MSH	0.00	0.00	**0.10**	**−0.15**	**0.11**	**−0.02**	**0.07**	**−0.11**	**−0.15**	**0.07**	**−0.19**		**−0.21**
FSH	**−0.03**	**−0.02**	**−0.39**	**0.42**	**0.18**	**0.59**	**0.02**	**−0.11**	**0.06**	**0.33**	**−0.14**	**−0.19**	

(1) Definitions of variables are provided in the Appendix A; (2) This table presents Pearson (Spearman) correlations. The coefficients shown in bold are significant at $p < 0.05$ (two-tailed test).

4.2. Regression Results

4.2.1. Regression of ESG Scores on the After-Marketing Announcement of Earnings Strategy (H1)

Table 3 provides the result of the regression test for H1 with regard to the association between ESG evaluation scores and the test variable *AC*, an opportunistic behavior announcing earnings after the market closing. Using the total ESG score as the dependent variable shown in the first column of Table 3, the coefficient on *AC* (−0.046) is negative and is statistically significant at the 1% level. This result is consistent with H1 confirming that firms releasing earnings news after market closing have lower scores for overall ESG performances. Similar findings are observed in subsequent regressions using ESG subcategory scores as dependent variables as well. The second to the fourth columns of Table 3 demonstrate that the coefficient on the main independent variable *AC* shows negative signs consistently across the dependent variables (coef. = −0.025 for *E_S*, coef. = −0.039 for *S_S*, and coef. = −0.122 for *G_S*). Especially the negative association is the strongest between *AC* and *G_S*, being consistent with the conjecture that corporate governance has a direct impact on a firm's information disclosure policy and the earnings announcement strategy would be more closely associated with the governance sector among ESG subcategories than the other two areas.

Table 3. The Association between ESG Scores and Earnings Announcements after Market Closing.

Variables	ESG_S			E_S			S_S			G_S		
	Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat	
Intercept	−2.141	−35.29	***	−2.541	−36.25	***	−3.152	−41.17	***	−2.401	−22.67	***
AC	−0.046	−6.48	***	−0.025	−3.05	***	−0.039	−4.31	***	−0.122	−9.88	***
NP	−0.363	−6.44	***	−0.724	−11.12	***	−0.350	−4.93	***	0.303	3.08	***
SIZE	0.218	74.04	***	0.232	68.40	***	0.264	71.14	***	0.242	47.10	***
SALES	0.111	6.28	***	0.243	11.90	***	0.242	10.88	***	−0.164	−5.31	***
LEV	−0.107	−5.80	***	−0.148	−6.91	***	−0.231	−9.87	***	0.025	0.78	
TQ	0.029	5.71	***	−0.006	−1.03		0.077	12.01	***	−0.002	−0.19	
BIG4	−0.018	−2.11	**	−0.037	−3.86	***	0.013	1.26		0.063	4.32	***
TRADE	0.145	7.41	***	0.202	8.90	***	0.177	7.17	***	−0.307	−8.96	***
MSH	−0.323	−14.35	***	−0.187	−7.17	***	−0.238	−8.37	***	−0.478	−12.16	***
FSH	0.512	16.54	***	0.347	9.70	***	0.413	10.57	***	0.895	16.58	***
Fixed Effect	Industry and Year											
Adj.R2	0.450			0.388			0.413			0.346		
N	17,370			17,370			17,370			17,370		

(1) Definitions of variables are provided in the Appendix A; (2) **, *** indicate significance at the 5 percent, and 1 percent levels, respectively.

The regression results on other control variables show that certain firm characteristics are associated with the ESG performance level. For example, the total ESG score is higher as the assets and revenue of firms increase (coef. on *SIZE* = 0.218, and coef. on *SALES* = 0.111), and the firm valuation measured as Tobin's Q increases (coef. on *TQ* = 0.029), whereas an increase in the debt ratio is negatively related to the ESG score (coef. on *LEV* = −0.107). Meanwhile, the regression coefficients on shareholding structures indicate that the ESG evaluation score increases in firms with less concentration on major shareholders (coef. on *MSH* = −0.323) and higher share of foreign shareholders (coef. on *FSH* = 0.512).

4.2.2. Regression of ESG Scores on the Friday Announcement of Earnings Strategy (H2)

Table 4 summarizes the regression results using the strategy of earnings announcement on Friday, *FRI*, as the main test variable. The first column of Table 4 shows that the coefficient on *FRI* (−0.018) is negative and statistically significant at the 5% level. Accordingly, it supports the H2 confirming that the total ESG score is negatively related to the opportunistic behavior of announcing earnings news on Friday. Meanwhile, the test results for the subsections of ESG, as shown in the second to fourth columns of Table 4, differ slightly across each section. In detail, the association with the ESG score for the environment section is negative but statistically insignificant, while the coefficients on *FRI* in the regressions for the social and the governance sector are both significantly negative (coef. on *FRI* = −0.040 under the third column and coef. on *FRI* = −0.028 under the fourth column, respectively).

Table 4. The Association between ESG Scores and Earnings Announcements on Friday.

Variables	ESG_S			E_S			S_S			G_S		
	Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat	
Intercept	−2.155	−35.47	***	−2.547	−36.30	***	−3.149	−41.12	***	−2.448	−23.05	***
FRI	−0.018	−2.40	**	−0.014	−1.65		−0.040	−4.34	***	−0.028	−2.20	**
NP	−0.314	−5.61	***	−0.697	−10.80	***	−0.307	−4.36	***	0.433	4.43	***
SIZE	0.217	73.77	***	0.232	68.27	***	0.263	70.92	***	0.240	46.72	***
SALES	0.110	6.21	***	0.242	11.87	***	0.241	10.82	***	−0.166	−5.39	***
LEV	−0.110	−5.91	***	−0.149	−6.97	***	−0.233	−9.96	***	0.020	0.61	

Table 4. *Cont.*

Variables	ESG_S			E_S			S_S			G_S		
	Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat	
TQ	0.030	5.85	***	−0.006	−0.97		0.077	12.05	***	0.001	0.06	
BIG4	−0.020	−2.46	**	−0.039	−4.03	***	0.010	1.00		0.055	3.79	***
TRADE	0.146	7.43	***	0.202	8.91	***	0.177	7.16	***	−0.305	−8.88	***
MSH	−0.321	−14.22	***	−0.185	−7.12	***	−0.237	−8.32	***	−0.470	−11.94	***
FSH	0.523	16.92	***	0.353	9.89	***	0.422	10.84	***	0.925	17.12	***
Fixed Effect	Industry and Year											
Adj.R2	0.450			0.388			0.413			0.343		
N	17,370			17,370			17,370			17,370		

(1) Definitions of variables are provided in the Appendix A; (2) **, *** indicate significance at the percent, and 1 percent levels, respectively.

4.2.3. Regression of ESG Scores on Whether to Disclose Preliminary Earnings Information (H3)

Table 5 presents the result of regressing the ESG performance scores on the opportunistic strategy of omitting preliminary earnings announcements. According to Table 5, this strategy is shown to be highly negatively associated with the ESG scores across all the relevant tests. For example, the coefficient on *NOPREL* (−0.178) for the total ESG score, as shown in the first column of Table 5, is negative and statistically significant at the 1% level. The negative association is observed consistently across the subcategories of ESG scores. In sum, those results support the H3, and the effects are even stronger than the above tests for H1 and H2. One of the possible explanations for its stronger effect would be as follows. Preliminary earnings reporting is an important event through which firms can communicate with stakeholders prior to the quarterly earnings announcement. Thus, the decision on whether to implement a preliminary earnings announcement is critical in terms of corporate governance and the decision-making process. Accordingly, a rational conjecture is that omitting preliminary earnings disclosure would imply a higher level of influence from managerial opportunism than the other behaviors simply cherry-picking the date or time for earnings announcement, which can explain the reason that the testing effect for H3 is stronger than the other tests.

Table 5. The Association between ESG Scores and Preliminary Earnings Announcements.

Variables	ESG_S			E_S			S_S			G_S		
	Estimate	t-Stat		Estimate	t-Stat		Estimate	t-Stat		Estimate	T-Stat	
Intercept	−1.521	−22.31	***	−2.096	−26.45	***	−2.379	−27.67	***	−1.623	−13.55	***
NOPREL	−0.178	−19.87	***	−0.127	−12.16	***	−0.219	−19.39	***	−0.232	−14.78	***
NP	−0.412	−7.42	***	−0.767	−11.88	***	−0.429	−6.13	***	0.305	3.12	***
SIZE	0.194	61.89	***	0.216	59.14	***	0.235	59.39	***	0.210	38.18	***
SALES	0.104	5.96	***	0.238	11.73	***	0.234	10.64	***	−0.173	−5.65	***
LEV	−0.091	−4.97	***	−0.136	−6.38	***	−0.210	−9.06	***	0.044	1.36	
TQ	0.015	2.87	***	−0.016	−2.78	***	0.059	9.18	***	−0.019	−2.14	**
BIG4	−0.023	−2.79	***	−0.040	−4.23	***	0.008	0.74		0.052	3.60	***
TRADE	0.125	6.42	***	0.187	8.27	***	0.152	6.19	***	−0.332	−9.72	***
MSH	−0.315	−14.14	***	−0.181	−7.00	***	−0.229	−8.15	***	−0.463	−11.82	***
FSH	0.468	15.24	***	0.314	8.79	***	0.354	9.14	***	0.853	15.81	***
Fixed Effect	Industry and Year											
Adj.R2	0.461			0.393			0.425			0.351		
N	17,370			17,370			17,370			17,370		

(1) Definitions of variables are provided in the Appendix A; (2) **, *** indicate significance at the 5 percent, and 1 percent levels, respectively.

5. Additional Tests

5.1. Effect of Combined Strategies for Earnings Announcement

The main test results above consistently support our research hypotheses, suggesting that each type of opportunistic earnings announcement behavior is negatively associated with ESG performance score. In this section, we perform additional analysis to supplement the main tests by observing the effect of the combination of earnings announcement strategies. Prior research suggests that firms can use multiple opportunistic strategies for earnings announcements to ensure firm managers attempt to deviate market attention [18,19]. Considering this, we generate a new test variable, *N_EA*, which reflects the number of earnings announcement strategies simultaneously adopted for a firm-quarter. Thus, *N_EA* has a range from 0 to 3 at maximum (as an instance, a firm with *AC* = 1, *FRI* = 1, and *NOPREL* = 1 has the value of 3 for *N_EA*), and the value of *N_EA* increases in the intensity of opportunistic strategies that a firm employs for a quarterly earnings announcement. In this regard, we conducted an additional test of regressing the total ESG performance score, *ESG_S*, on the main explanatory variable, *N_EA* as the following model:

$$ESG\_S_{it} = \beta_0 + \beta_1 N\_EA_{it} + \beta_2 NP_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 SALES_{it} + \beta_6 TQ_{it} + \beta_7 BIG4_{it} + \beta_8 TRADE_{it} + \beta_9 MSH_{it} + \beta_{10} FSH_{it} + \sum \beta_m YEAR + \sum \beta_n IND + \varepsilon \quad (2)$$

As shown in the Panel A of Table 6, the additional test provides that the coefficient on *N_EA* is negative (−0.059) and statistical significance is high (t-stat = −14.25), indicating that a firm with the more number of opportunistic strategies for earnings announcement has a lower score of ESG performance evaluation. In addition to reaffirming the main test result, this additional analysis demonstrates that the combination of multiple earnings announcement strategies reflects a higher level of managerial opportunism which can eventually lower the ESG quality of a firm.

Table 6. Additional Analysis.

Panel A: The Association between ESG Scores and Number of Earnings Announcements Strategies			
Variables	**ESG_S**		
	Estimate	***t*-Stat**	
Intercept	−1.889	−29.83	***
N_EA	−0.059	−14.25	***
NP	−0.405	−7.24	***
SIZE	0.209	70.33	***
SALES	0.108	6.18	***
LEV	−0.101	−5.50	***
TQ	0.023	4.50	***
BIG4	−0.018	−2.21	**
TRADE	0.136	6.98	***
MSH	−0.325	−14.48	***
FSH	0.491	15.93	***
Fixed Effect	Year, Industry		
Adj.R2	0.455		
N(Observations)	17,370		
Panel B: The Association between ESG Disclosure and Number of Earnings Announcements Strategies			
Variables	**ESG_D**		
	Estimate	***t*-stat**	
Intercept	−1.907	−40.21	***

Table 6. *Cont.*

N_EA	−0.027	−9.08	***
NP	−0.168	−3.90	***
SIZE	0.102	46.59	***
SALES	0.133	9.81	***
LEV	−0.076	−5.89	***
TQ	0.002	0.55	
BIG4	−0.043	−7.34	**
TRADE	0.123	7.66	***
MSH	−0.234	−14.64	***
FSH	0.218	9.80	***
Fixed Effect	Year, Industry		
Adj.R2	0.378		
N(Observations)	10,380		

(1) Definitions of variables are provided in the Appendix A; (2) **, *** indicate significance at the 5 percent, and 1 percent levels, respectively.

Further, we conducted an additional analysis to examine whether the opportunism behind earnings announcements is related to the decision on ESG disclosure. In other words, we hypothesize that a firm with low integrity for earnings disclosure would be likely to neglect ESG-related disclosure as well. To test for this conjecture, we collected new data set on ESG reporting of Korean firms from the Korean Institute of Certified Public Accountants and prepared an additional test variable *ESG_D* which has the value of 1 if a firm issues an ESG report for the relevant fiscal period or 0 otherwise. We employed the following research model, which regresses *ESG_D* on the total number of opportunistic earnings announcement strategies, *N_EA*. Due to the data availability, the test period was reduced to 4 years from 2015 to 2018.

$$\begin{aligned} ESG\_D_{it} = {} & \beta_0 + \beta_1 N\_EA_{it} + \beta_2 NP_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 SALES_{it} + \beta_6 TQ_{it} \\ & + \beta_7 BIG4_{it} + \beta_8 TRADE_{it} + \beta_9 MSH_{it} + \beta_{10} FSH_{it} + \sum \beta_m YEAR + \sum \beta_n IND \\ & + \varepsilon \end{aligned} \quad (3)$$

As shown in the Panel B of Table 6, the coefficient estimate on *N_EA* is negative (−0.027) and statistically significant at the 1% level. The result indicates that firms strategically adjusting earnings announcement timing and method tend to neglect ESG reporting as well. In combination with the main test results, this analysis provides comprehensive insight that managerial opportunism may affect not only the quality of ESG performance itself but also the disclosure of ESG information.

5.2. Robustness Check Using Propensity Score Method

In this section, we revisit the main tests using the approach of propensity score matching to address the potential endogeneity issue. The concern is that the negative association between ESG performance and opportunistic earnings announcement strategies might be driven by an endogenous effect from an unobserved or omitted variable which is confounding both independent and dependent variables. To control for the endogeneity or sample selection bias, we apply a propensity score matching ("PSM") technique commonly shown in prior research [32].

Under the PSM, we create a matched sample of treatment and control groups based on their propensity scores for adopting opportunistic strategies to ensure the treatment firms (e.g., firms with AC = 1 relating to the first hypothesis) are not systematically different from the control firms (e.g., firms with AC = 0) in terms of firm characteristics. Propensity scores are estimated using a logistic regression model that predicts the likelihood of adopting each of the earnings announcement strategies based on observable characteristics such as firm size, debt ratio, shareholding structure, return on assets, and earnings volatility, which are known to affect corporate ESG outcomes and accounting quality based on previous

research [33–35]. In this regard, we adopt the following logistic regression models for each of the main variables (i.e., AC, FRI, and NOPREL, respectively).

$$EA_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 ROA_{it} + \beta_4 EVOL_{it} + \beta_5 MSH_{it} + \beta_6 FSH_{it} + \varepsilon \quad (4)$$

The main test variable *EA* in the above Formula (1) collectively represents the indicator variables for each type of opportunistic earnings announcement behavior. Further, *ROA* refers to the ratio of net profit to assets, and *EVOL* indicates the earnings volatility measured as the scaled standard deviation of earnings for the previous eight quarters. Then, we match the treatment and the control groups based on the propensity score (nearest neighbor matching) for each main variable and conduct the main regression analyses using the matched samples. As shown in Table 7 below, the negative association between the ESG performance level and the indicator of opportunistic earnings strategies also stands consistently across the matched samples. These additional test results show that the observation under the main analysis is robust to the potential endogeneity problem.

Table 7. Regression Tests Using the Samples from Propensity Score Matching.

Panel A: The Association between ESG Scores and Earnings Announcements after Market Closing												
Variables	**ESG_S**			**E_S**			**S_S**			**G_S**		
	Estimate	**t-Stat**		**Estimate**	**t-Stat**		**Estimate**	**t-Stat**		**Estimate**	**t-Stat**	
Intercept	−2.213	−31.59	***	−2.623	−32.22	***	−3.270	−36.71	***	−2.294	−18.71	***
AC	−0.046	−5.78	***	−0.024	−2.62	***	−0.040	−3.98	***	−0.116	−8.37	***
Controls [a]												
Fixed Effect	Industry and Year											
Adj.R2	0.470			0.402			0.431			0.353		
N	12,736			12,736			12,736			12,736		
Panel B: The Association between ESG Scores and Earnings Announcements on Friday												
Variables	**ESG_S**			**E_S**			**S_S**			**G_S**		
	Estimate	**t-stat**		**Estimate**	**t-stat**		**Estimate**	**t-stat**		**Estimate**	**t-stat**	
Intercept	−2.032	−27.18	***	−2.456	−27.98	***	−2.856	−30.81	***	−2.537	−18.78	***
FRI	−0.028	−3.33	***	−0.015	−1.50		−0.042	−4.02	***	−0.025	−1.66	*
Controls [a]												
Fixed Effect	Industry and Year											
Adj.R2	0.453			0.379			0.412			0.345		
N	10,446			10,446			10,446			10,446		
Panel C: The Association between ESG Scores and Preliminary Earnings Announcements												
Variables	**ESG_S**			**E_S**			**S_S**			**G_S**		
	Estimate	**t-stat**		**Estimate**	**t-stat**		**Estimate**	**t-stat**		**Estimate**	**t-stat**	
Intercept	−2.016	−21.08	***	−2.840	−26.75	***	−3.122	−25.94	***	−1.384	−8.84	***
NOPREL	−0.150	−12.70	***	−0.084	−6.44	***	−0.194	−13.09	***	−0.161	−8.32	***
Controls [a]												
Fixed Effect	Industry and Year											
Adj.R2	0.496			0.459			0.455			0.392		
N	10,711			10,711			10,711			10,711		

(1) Definitions of variables are provided in the Appendix A; (2) *, *** indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. [a] The regression coefficients on the control variables are not shown for convenience, while the results remain qualitatively the same as the main analysis.

6. Conclusions

In recent years, there has been a paradigm shift in the business world towards ESG in response to a growing recognition of the need for companies to consider their impact on

the environment, society, and governance in addition to their financial performance. Under the growing interest in ESG across business industries, an increasing number of firms have published ESG reports to deliver information on their ESG performance to interested stakeholders. However, it is difficult for the stakeholders to fully assess the firm's ESG performance due to the problems of ESG disclosure, including the lack of standardization, the data manipulation risk and the potential for greenwashing. In this respect, this study suggests a heuristic method of detecting a firm with managerial opportunism that could undermine ESG performance by observing its earnings announcement behavior.

Using a sample of Korean firms, this study provides empirical evidence that firms with opportunistic earnings announcement strategies have a relatively lower score for their ESG performance evaluation. First, the corporate decision to announce earnings during the hour after market closing is negatively associated with the ESG performance score, which meets the hypothesis. Second, the negative association is also observed when we observe the relationship between the earnings announcement on Friday and the ESG score, while the effect size is relatively smaller than the other tests. Third, firms with no preliminary earnings disclosure have lower ESG scores than the other firms, and the negative association is the strongest in comparison to the other two tests. Congruent with the findings, additional analysis in this paper shows that firms adopting a greater number of the aforementioned opportunistic strategies for earnings announcement on a collective basis have a lower level of ESG performance score. A further test for comparing disclosure quality between earnings announcement and ESG reporting reveals that firms adopting a greater number of opportunistic strategies for earnings announcement are more likely to skip the ESG disclosure, which implies that managerial opportunism can affect both the earnings and the ESG disclosure.

Our findings in this study provide practical implications and contribute to future research in several ways. First, our study presents a new research idea that earnings disclosure can also be analyzed for the purpose of interpreting corporate performance on the ESG agenda, which has grown exponentially in the recent business environment. The recent trend in ESG-related research emphasizes an interdisciplinary approach combining different areas of research perspectives. For example, the study of Velte (2019) [3] indicates that ESG performance is negatively associated with certain types of earnings management. Further, Delegkos et al. (2022) [36] suggest that the integrated reporting comprehensive of financial, economic, and ESG data is value relevant and can provide the full range of a firm's risk and opportunity profile. Consistent with this trend, our study expands the research horizon by linking ESG and financial accounting research.

Second, our empirical test results provide solid evidence that opportunistic behaviors in earnings announcements are negatively associated with the quality of ESG performance. The findings suggest a practical application in that ESG investors and related stakeholders can observe the earnings announcement patterns as a convenient and heuristic method of assessing a firm's ESG performance. This can provide information users with various advantages for the following reasons. Basically, ESG disclosure is not mandatory in most countries, and there has been no consistent disclosure standard widely accepted across the world, unlike the accounting standards, including the U.S. GAAP or the IFRS. This lowers the comparability of ESG information across companies in addition to the fact that the content of ESG activities is abstract and vague, which is inherently difficult to understand in comparison to accounting information. Moreover, the ESG disclosure is normally made once a year or less, which is much more scarce than earnings announcements made on a quarterly basis. Moreover, the true performance of ESG activities could be obscured by a firm's opportunistic decision on ESG information disclosure, which may lead to greenwashing behavior. Accordingly, it is not easy for the general public to assess the level of ESG performance correctly by simply relying on the ESG disclosure made at the firm's own discretion. In contrast, every firm listed in one of the major stock markets in the world is obliged to provide earnings announcements following the applicable accounting standards. This enables information users to observe and compare the earnings disclosure

behaviors across companies, which can help to assess the patterns of corporate disclosure and detect any anomaly therein.

Finally, this study provides implications for policymakers as well in that managerial opportunism can significantly affect the reliability of ESG reports, and proper policy measures should be implemented in a timely manner to reduce excessive managers' discretion in preparing ESG reports and thus enhance their verifiability and comparability.

One caveat in our study is that the sample period is limited to the years before 2019 due to data restriction and, therefore, might fail to reflect a recent change in the market environment. To mitigate a potential bias from this limitation, we adopt the following approach. We initially use panel data with a sufficient number of observations on a firm-quarter basis which can minimize cross-sectional or time-series deviation. Then we find no anomaly in the time trend of ESG scores and earnings announcement data and show that the test results hold consistent in a subsection of the sample period as in the additional test. The above approach reveals that the data set in this study is stable over time, implying that our test results could be reasonably extrapolated to the recent out-of-sample period. Nonetheless, the limitation of the data period still exists, and the test results in this regard should be interpreted with caution.

Another concern is the potential endogeneity in the relationship between ESG and disclosure quality. Even though the main purpose of this research is not to find a causal effect but an association between the test variables, which could be utilized as a practical hallmark for stakeholders, we conducted an additional analysis using the propensity score matching approach to mitigate the endogeneity concern. Regardless, the empirical results in this study could be subject to selection bias due to endogeneity, and the results should be interpreted with caution.

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Appendix A

Table A1. Variable Definitions.

Variables	Definition
ESG_S	Score of total ESG performance of samples firms as rescaled into numerical values from 0 to 5
E_S	Score on the Environment-related performance of samples firms as rescaled into numerical values from 0 to 5
S_S	Score on the Social-related performance of samples firms as rescaled into numerical values from 0 to 5
G_S	Score on the Governance-related performance of samples firms as rescaled into numerical values from 0 to 5
AC	Indicator variable that equals one if a sample firm announces earnings after market closing and zero otherwise
FRI	Indicator variable that equals one if a sample firm releases an earnings announcement on Friday and zero otherwise

Table A1. *Cont.*

Variables	Definition
NOPREL	Indicator variable that equals one if a sample firm omits a preliminary earnings announcement and zero otherwise
NP	Net profit as deflated by the market value of equity as of the previous quarter's end
SIZE	Natural log-transformed amount of total assets at quarter-end
LEV	Ratio of total debts to total assets at quarter-end
SALES	Sales revenue divided by total assets at quarter-end
TQ	Tobin's Q, which is computed as a ratio of the market value of the equity and total liabilities to the book value of total assets
BIG4	Indicator variable that equals one if a firm hires one of the major four accounting firms as its financial auditor and zero otherwise
TRADE	Stock trading volume for the subject quarter divided by the number of outstanding shares and transformed into a decile industry ranking score from 0 to 1
MSH	Portion of the largest major shareholders among the whole shareholders at quarter-end

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