Corporate Sustainability Management, Earnings Transparency, and Chaebols

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Abstract: This study examines the association of corporate sustainability management with earnings transparency. Based on previous studies that indicate that sustainability management activities reduce earnings management and corporate risk and increase a firm's value, this study predicts that the firms with effective sustainability management will have a high earnings transparency. In addition, this study examines the differential effect of corporate sustainability management on earnings transparency according to whether or not a firm belongs to a chaebol. We use Environmental, Social, and Governance (ESG) ratings of the Korean Corporate Governance Service (KCGS) as a proxy for corporate sustainability management and apply the method of Cheng and Subramanyam (2008) to measure earnings transparency. The empirical results show that there is a significant positive relationship between corporate sustainability management and earnings transparency. Furthermore, the association between corporate sustainability management and earnings transparency is more negative for firms belonging to a chaebol. These results indirectly show that firms belonging to a chaebol have a lower level of information asymmetry than firms not belonging to a chaebol. This study focuses on corporate sustainability management as a determinant of earnings transparency, and is useful for examining the effect of belonging to a chaebol on the relationship between sustainability management and earnings transparency. Our results are expected to provide important implications not only for managers, but also for investors and regulators.

Keywords: corporate sustainability management; corporate social responsibility; earnings transparency; chaebol

1. Introduction

Recently, social awareness of sustainability management has increased, and corporate globalization, the emergence of various stakeholders, and climate change have increased interest in corporate sustainability management (CSM). In particular, the implementation of CSM in internationalized capital markets has emerged as a very important factor in investment decisions. Corporate social responsibility is therefore no longer merely a passive response to social needs, but is recognized as an element to which companies must actively respond.

This study empirically analyzes the relationship between corporate sustainability management and earnings transparency, and also examines whether affiliation with a chaebol affects this relationship. CSM refers to the concept of sustainable development, which grew out of the environmental movement in the 1970s, emerging from a pessimistic suggestion in a report by the Roman Club that the inexorably growing population will eventually deplete the earth's resources.

This report triggered great attention to environmental protection and natural resources in a society that had focused only on economic growth since the Industrial Revolution. Accordingly, corporate sustainability, or sustainability management, has changed from a concept of "environmentally sustainable development" to one of social and economic sustainability [1]. CSM can be defined as a management activity that strives for the sustainable development of the environment, economy, and society, while simultaneously minimizing the risks and enhancing the value of an enterprise, including shareholder value [2]. This concept makes a great deal of sense in an age of hyper-globalization, where CSM is important in maintaining positive stakeholder perceptions and public opinion. We are therefore interested in the effects of corporate sustainability management. We examine the broader concept of corporate social responsibility (CSR), which includes environmental protection, community development, corporate governance, employee relations, diversity practices, human rights, and product quality.

Many studies found that CSR can improve financial performance through a variety of channels, such as labor reputation [3], customer awareness [4], labor productivity [5], mutual monitoring [6], CSR-contingent executive compensation [7], and reduction of cost equity capital [8]. In addition, previous studies pertaining to sustainability management focused on the relevance of sustainability management to earnings management, corporate risk, and firm value. Previous studies reported that sustainability management activities reduce information asymmetry by reducing earnings management [9–13]. As the quality of accounting information improves and information asymmetry between investors and information providers declines, the value of firms actively performing sustainability management activities is increased [6,14].

Among the various potential factors related to CSR disclosure decisions, we focus on earnings transparency for its critical role in a firm's financing and general operation decisions. Firms that provide sufficient information to external stakeholders to aid in rational decision-making and maintaining good relationships increase earnings transparency.

Meanwhile, accounting transparency can be defined as providing information users with accounting information with qualitative attributes of financial reporting. However, accounting transparency is not observable, and it is therefore difficult to assess the transparency of individual companies. In contrast, earnings transparency is defined as the explanatory power of the earnings on the stock price return and the change in earnings, and the stock return reflects changes in the economic value of the company because the information disclosed under an efficient market assumption is reflected in the stock price. Therefore, the earnings transparency determined by the capital market evaluation of profit information is an objective measure [15]. This study analyzes the effect of sustainability management activities on earnings transparency by using earnings transparency as a dependent variable.

Unlike firms in other countries, many Korean firms are characterized by their unique ownership structures, such as those of family-owned business groups, known as chaebols. Ownership structure is important because it can affect firms' decision-making on their long-term objectives. Regarding chaebols, there are two views on chaebol affiliates and the information environment. A chaebol is a large industrial conglomerate run and controlled by single owner or family in South Korea. Park et al. [15] showed that chaebol-affiliated companies are strengthened in post-regulation and market surveillance functions. In addition, external stakeholders require more detailed and accurate information about these large-scale and high-market conglomerates. A chaebol is the subject of active interest to financial analysts, institutional investors, and foreign investors. Therefore, firms belonging to a chaebol will have a lower information asymmetry than those not belonging to a chaebol. Kwon et al. [16] report that firms belonging to a chaebol have a lower information asymmetry because a chaebol's owner(s) makes (make) decisions about investments and personnel and perform powerful monitoring functions. On the other hand, Park and Cho [17] reported that chaebol-affiliated companies have various characteristics, such as a diversified corporate governance structure and circulating investments, characteristics which make it difficult for outside investors to collect investment structure data on subsidiaries and, therefore, difficult to access decision-making

information at the corporate group level or analyze direct or indirect influence on individual firms. In other words, firms belonging to a chaebol may have greater information asymmetry.

This study focuses on sustainability management activities as a determinant of earnings transparency based on previous research results. Previous research reported that better sustainable management activities result in the reduction of earnings management, information asymmetry, and corporate risk, and the increase of enterprise value. This study predicts that the earnings transparency will increase as sustainability management activities improve. In addition, we analyze the relationship between a firm's sustainability management and earnings transparency according to whether they belong to a chaebol. The Environmental, Social and Governance (ESG) ratings of the KCGS (Korean Corporate Governance Service) were used as an indicator of sustainability management, and Cheng's and Subramanyam's [18] method was applied to measure earnings transparency. If we look at a high-sustainability company from an accounting perspective, we can say that it has high accounting transparency. It can therefore be inferred that firms with high sustainability will also have high accounting transparency. However, corporate sustainability is a factor revealed mainly in relation to the outside world, whereas accounting transparency is a process which takes place within a company. The earnings transparency used in this study is a more comprehensive measure than accounting transparency, which is reflected in the stock price as an indicator of relevance to the outside.

The empirical results show a significant positive relationship between corporate sustainability management and earnings transparency, meaning that a company with effective sustainability management activities has a higher earnings transparency. This is in line with previous studies, which found that sustainability management activities reduce earnings management and corporate risk and increase firm value [10–14]. In addition, the positive correlation between corporate sustainability management and earnings transparency is less pronounced in firms belonging to a chaebol. These results indirectly show that firms belonging to a chaebol have a lower information asymmetry level than firms not belong to a chaebol [15].

This study makes the following contributions compared to prior studies of corporate sustainability management. First, our study defines earnings transparency based on how earnings information describes the change in economic value of a company from the viewpoint of accounting transparency, and empirically examines the relationship between earnings transparency and sustainability management. Second, non-financial information, such as sustainability management, is reflected in earnings transparency, thus providing empirical evidence that non-financial indicators are reflected in stock prices. Third, our study provides a better understanding of the role of a chaebol in the relationship between CSM and earnings transparency. Finally, this study has a practical implication in that when making investment decisions, investors can consider the fact that firms with effective sustainability activities have high transparency.

The remainder of the paper is organized as follows. Section 2 reviews the related literature and develops testable hypotheses. Section 3 discusses the research design. Section 4 presents the empirical results of the study. Finally, Section 5 concludes the study.

2. Literature Review and Research Hypotheses

2.1. Corporate Sustainability Management and Earnings Transparency

Corporate sustainability management (CSM) refers to the pursuit of earnings for all of society simultaneously, including environmental management, ethical management, social contributions, and the welfare of workers and the community, while the company is engaged in production and sales activities. It also refers to all activities that create sustainable performance in terms of the economy, environment, and society to promote sustainable corporate value [12]. CSM not only contributes to corporate profit-seeking and compliance with ethical responsibility, but also to social development by appropriately responding to the social demands of various stakeholders.

Previous studies focused on the relevance of sustainability management to earnings management [11–13], corporate risk, and firm value [10,14,15]. This study focuses on the relationship

between sustainability management and earnings transparency. Kim et al. [10] analyzed the relationship between sustainability and earnings management. The social aspect of the sustainability index showed a significantly negative relationship with discretionary accruals. This indicates that the higher the social index, which represents ethical behavior, the less unethical behavior is involved in earnings management. Lee [11] analyzed the relationship between the (first) issuance and suspension of the sustainability report and earnings management. If net income is more than zero, the year immediately after the first issue shows a negative relationship between sustainability and earnings management. If the net income is less than zero, the sustainability report and earnings management do not show a significant relationship. Lee and Kang [12] analyzed whether the sustainability report affects earnings management. CO_2 emissions and environmental investment were used as proxies for sustainable activities. The analysis found that socially responsible activities prevent earnings management, which is unethical. However, in the case of problems such as CO_2 emissions, government supervision is strengthened and can deter firms from engaging in unethical activities. Cho and Kim [19] studied the impact of CSR activities on the sustainability of accounting earnings. Their analysis found that companies with high performance in social responsibility activities have higher earnings persistence coefficients than companies with low performance. In other words, the better the CSR activity, the higher the quality of earnings.

Kim et al. [14] examined the relationship between CSR and firm value in the context of ownership structure, and found that CSR is positively associated with firm value, and that the relationship between CSR and firm value is weaker in firms with high large-shareholder ownership than in firms with low large-shareholder ownership.

According to agency theory, natural conflicts arise between shareholders and managers because individuals act to maximize their own utility and managers do not always act in the best interests of shareholders [20]. Under agency theory, a series of empirical studies suggests that ethical management and corporate governance through CSM will reduce managerial opportunism and increase financial reporting quality.

Meanwhile, stakeholder theory emphasizes that an organization's success and survival hinge on its ability to generate sufficient wealth, value, and satisfaction for its primary stakeholders, though not exclusively for shareholders [21]. Agency theory suggests that environmental protection, community engagement, charitable contributions, and other socially responsible activities can shift the management's attention from short-term reported earnings to long-term sustainable performance and thus reduce shortsighted unethical behaviors, such as earnings management. Empirical results show that CSR activities are consistent with stakeholder theory. Kim et al. [22] analyzed whether CSR activities can mitigate the negative impacts of problems with stakeholders and found that the firm risk of companies performing many CSR activities was relatively low. In addition, they analyzed the moderating effect of variables related to intangible assets, such as the ratio of market price to book value, firm size, advertising costs, and number of employees, on the relationship between CSR activities and firm risks. The additional analysis verified that the relationship between CSR activities and firm risks is strengthened as the variables related to intangible assets increase. Hwang [9] analyzed the value relevance of social responsibility and found a positive relationship between social responsibility and stock price. Lee and Lee [13] analyzed the effect of CSR activities on firm value and found that, first, comprehensive CSR activities have a significantly positive effect on firm value, and, second, that CSR activities in the social and governance sectors have a significantly positive effect on firm value.

In summary, under agency theory and stakeholder theory, firms with effective sustainability management activities show higher corporate value due to the reduction of managerial opportunism, information asymmetry, and corporate risk. In other words, firms with effective sustainability management activities can expect higher earnings transparency due to an increase in financial reporting quality. Therefore, in terms of the relationship between sustainability management and earnings transparency, this study sets Hypothesis 1 as follows:

Hypothesis 1 (H1). *Corporate sustainability management is positively associated with earnings transparency.*

2.2. Corporate Sustainability Management, Earnings Transparency, and Chaebols

Corporate governance is defined as the interaction between shareholders, the board of directors, management, and other stakeholders. Specifically, it controls the appointment and decision-making of executives responsible for corporate management [23]. Firms with a poor governance structure have more serious information asymmetry between management and investors, which causes various conflicts and may result in inefficient investment decisions [24].

A chaebol has more post-regulation and market surveillance functions than other companies. According to stakeholder theory, external stakeholders demand more detailed and accurate information about large-scale and high-market conglomerates. A chaebol is actively engaged by financial analysts, institutional investors, and foreign investors. Therefore, firms belonging to a chaebol will have less information asymmetry than those not belonging to a chaebol [15]. Kwon et al. [16] report that firms belonging to a chaebol have a lower information asymmetry because the owners of a chaebol make decisions about investments and personnel of chaebol-affiliated companies and perform powerful monitoring functions. However, large-scale corporations have characteristics such as complex corporate structures and cyclical investments. As a result, it is difficult for external investors to collect information on subsidiaries' affiliate structures, access decision-making information at the enterprise level, or analyze, directly or indirectly, the influence on individual firms. Therefore, applying the agency theory, the information asymmetry of firms belonging to a chaebol may be greater than that of firms that do not [17].

As described above, under agency theory and stakeholder theory, there are two conflicting opinions on the information environment of chaebols. Since the information asymmetry of chaebol-affiliated firms may be different, the relationship between sustainability management activities and earnings transparency can be differentially predicted to depend on whether or not they belong to a chaebol. If the information asymmetry of chaebol affiliates is high (low), the positive relationship between sustainability management activities and earnings transparency for chaebol affiliates will be more (less) pronounced than that of non-chaebol affiliates. Therefore, in regarding the relationship of whether or not firms belong to a chaebol with the relevance of sustainability management and earnings transparency, this study sets Hypothesis 2 as follows:

Hypothesis 2 (H2). *The relevance of a firm's corporate sustainability management and earnings transparency will differ depending on whether or not they belong to a chaebol.*

3. Research Design and Sample Selection

3.1. Empirical Models

In Equation (1), we use a multivariate regression model to investigate whether corporate sustainability management enhances earnings transparency, as we expect. The regression model for testing Hypothesis 1 is as follows [25,26]:

$$
\begin{aligned}
TRANS_{i,t} =\ & \beta_0 + \beta_1 CSM_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 INTAN_{i,t} + \beta_5 GRW_{i,t} \\
& + \beta_6 AGE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 ROA_{i,t} + \beta_9 LOSS_{i,t} \\
& + \sum YD + \sum ID + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

where $TRANS_{i,t}$ is the earnings transparency, which is measured by Cheng and Subramanyam [18] for firm i in year t; $CSM_{i,t}$ indicates the level of sustainability management, which is the ESG ratings (ESG integration sector, governance sector, social sector, and environmental sector) of the KCGS (Korean Corporate Governance Service). Equation (1), if the coefficient (β_1) of $CSM_{i,t}$ has a significantly positive (+) value, indicates that corporate sustainability management positively affects earnings transparency.

We included various control variables associated with earnings transparency. $SIZE_{i,t}$ is the natural logarithm of total assets, which controls the size effect. $LEV_{i,t}$ is the financial leverage, determined by the ratio of total debt to total assets, which controls the financial risk of a firm. $INTAN_{i,t}$

is the intangible asset divided by total assets. $GRW_{i,t}$ is the growth rate, which is measured as (total assets for firm i in year t – lagged total assets)/lagged total assets. $AGE_{i,t}$ is the natural logarithm of firm age. $MTB_{i,t}$ is the market value of equity divided by the book value of equity, which controls the growth opportunities. $ROA_{i,t}$ is the return on assets, which is measured as the pretax income of t divided by the lagged total assets. $LOSS_{i,t}$ is an indicator variable that takes a value of 1 if a firm reports a loss (net income < 0), and 0 otherwise. Finally, year dummies (*YD*) and industry dummies (*ID*) are included to control the effects of year and industry on future profitability.

In Equation (2), we examine the effect of belonging to a chaebol on the relationship between corporate sustainability management and earnings transparency. We employ the following regression model to test Hypothesis 2:

$$
\begin{aligned}
TRANS_{i,t} \ = \ &\beta_0 \ + \ \beta_1 CSM_{i,t} + \ \beta_2 CHAEBOL_{i,t} + \ \beta_3 CSM \times CHAEBOL_{i,t} + \\
&\beta_4 SIZE_{i,t} \\
&+ \ \beta_5 LEV_{i,t} + \ \beta_6 INTAN_{i,t} + \ \beta_7 GRW_{i,t} + \ \beta_8 AGE_{i,t} + \ \beta_9 MTB_{i,t} \\
&+ \ \beta_{10} ROA_{i,t} + \ \beta_{11} LOSS_{i,t} + \sum YD \ + \ \sum ID + \varepsilon_{i,t}
\end{aligned}
\tag{2}
$$

where $TRANS_{i,t}$ is earnings transparency, which is measured by Cheng and Subramanyam [18] for firm i in year t; $CSM_{i,t}$ indicates the level of sustainability management, which is the ESG rating (ESG integration sector, governance sector, social sector, and environmental sector) of KCGS (Korea Corporate Governance Service); $CHAEBOL_{i,t}$ is an indicator variable: If a firm belongs to a chaebol, it takes the value of 1, and 0 otherwise; and CSM×$CHAEBOL_{i,t}$ is the interest variable, which is the interaction variable between $CSM_{i,t}$ and $CHAEBOL_{i,t}$. The coefficient (β_3) of $CSM×CHAEBOL_{i,t}$ indicates the differences of the effects of corporate sustainability management on earnings transparency between chaebol affiliates and non-chaebol affiliates. The control variables employ the same variables as in Equation (1).

3.2. Measurement of Variables

3.2.1. Earnings Transparency

Based on Cheng and Subramanyam [18], we measure our earnings transparency as follows:

$$
ARET_{i,t} \ = \ \beta_0 \ + \ \beta_1 NI_{i,t} + \ \beta_2 LOSS_{i,t} + \ \beta_3 NI \times LOSS_{i,t} + \ \beta_4 \Delta NI_{i,t} + \varepsilon_{i,t}
\tag{3}
$$

$$
\begin{aligned}
TRANS_{i,t} = [ARET_{i,t} - (&\hat{\beta}_0 \ + \ \hat{\beta}_1 NI_{i,t} + \ \hat{\beta}_2 LOSS_{i,t} + \ \hat{\beta}_3 NI \times LOSS_{i,t} + \\
&\hat{\beta}_4 \Delta NI_{i,t})]^2 \times (-1)
\end{aligned}
\tag{4}
$$

where $ARET_{i,t}$ is measured as the market-adjusted returns for 12 months from April of the current fiscal year to March of the next fiscal year; $NI_{i,t}$ is measured as the net income divided by a beginning market value of equity; $Loss_{i,t}$ is an indicator variable—if a firm reports negative income, it takes the value of 1, and 0 otherwise; and $\Delta NI_{i,t}$ is measured as the change in net income divided by a beginning market value of equity. Equation (3) is applied as a cross-section to estimate coefficients, and the estimated coefficients and earnings information of the individual firms are substituted into Equation (4). The earnings transparency is the difference between stock returns and market-adjusted returns. To measure the magnitude of this difference, we squared the values obtained by subtracting the estimated stock returns from the actual market-adjusted returns, as shown in Equation (4). In order to have a property whose value increases as the earnings transparency increases, we multiplied the squared values in Equation (4) by negative one (−1).

3.2.2. Corporate Sustainability Management

The KCGS has conducted evaluation of corporate governance since 2003 based on a high level of transparency and expertise. In 2011, it adopted annual ESG evaluation, adding social responsibility and environmentally responsible management to measure the level of sustainable management by the listed companies in Korea. Through ESG evaluation, the KCGS aims to help listed companies understand where they are in sustainability management and seek improvement where necessary.

The ESG evaluation model has been developed by the KCGS independently and is not only aligned with international standards, such as the Organization for Economic Cooperation and Development (OECD) principles on corporate governance and ISO26000, but is also faithfully reflective of legal and management circumstances in Korea (KCGS). Therefore, the CSM index of the KCGS is objective, and it has been widely used as a proxy for CSM in several previous studies. The ESG ratings of the KCGS are divided into four categories (ESG integration sector, governance sector, social sector, and environmental sector), which are then labeled as A+, A, B+, B, C+, and C. In this study, the ESG ratings of KCGS are scored as follows: A+ = 10, A = 9, B+ = 8, B = 7, C+ = 6, and C = 5 [27]. The governance sector has a distribution of 10 to 5 points, while the rest of the sectors have a distribution ranging from 10 to 7. If the hypothesis of this study is supported, the coefficient value of the ESG score is expected to have a positive value. In other words, it is predicted that the higher the score, the higher the earnings transparency. It is anticipated that the ESG integration sector (=TOTAL_SCORE), governance sector (=GOV_SCORE), social sector (=SOC_SCORE), and environmental sector (=ENV_SCORE) will all have the same sign.

3.3. Samples and Data

The sample used in our study consists of firms in manufacturing industries listed on the Korean Exchange (KRX) and with a fiscal year ending in December. Financial data and stock price returns data were collected from the FN Data Guide. Financial firms are excluded because their operating characteristics and financial statement accounts are different from those of manufacturing firms. For comparability, we excluded firms with impaired capital and firms without the financial data needed for analysis. We analyzed firms that are able to collect information on the evaluation grade of sustainable management in the KCGS (Korea Corporate Governance Service). In addition, each variable except for the dummy variable was winsorized by observing the outlier with the lower 1% and upper 99%. The final sample used in the analysis consisted of 3934 firm-year observations. The following is the distribution by year and industry.

Table 1 shows the distribution of the sample by industry and year. The frequency of samples by year is similar except for 2011. The reason for the lowest frequency of sample in 2011 is because KCGS first published the CSM ratings at that time. The most frequent industries are those of coke, chemicals, and professional services, while the lowest are the publishing, broadcasting, rubber, plastic, and non-metal industries.

Table 1. Industry distribution of the sample.

	2011	2012	2013	2014	2015	2016	2017	Number of Firms
Food and Beverage	13	32	32	34	34	34	36	215
Fiber, Clothes, and Leathers	3	24	24	23	24	25	26	149
Timber, Pulp, and Furniture	17	22	24	24	23	23	24	157
Cokes and Chemical	44	60	62	65	64	66	67	428
Medical Manufacturing	10	30	29	30	33	32	37	201
Rubber and Plastic	8	17	17	19	19	19	19	118
Non-Metallic	11	17	18	16	17	18	21	118
Metallic	31	46	46	46	47	49	50	315
PC and Medical	29	40	40	40	40	40	41	270
Machine and Electronic	24	39	39	38	38	41	41	260
Other Transportation	29	42	41	43	43	45	49	292
Construction	25	29	28	28	28	27	29	194
Retail and Whole Sales	16	46	47	48	49	52	54	312
Transportation Services	13	18	19	19	19	20	21	129
Publishing and Broadcasting	2	9	12	13	14	14	14	78
Professional Services	22	56	63	63	63	66	70	403
Other	11	34	47	48	49	52	54	295
Total	308	561	588	597	604	623	653	3,934

4. Empirical Results

4.1. Descriptive Statistics and Correlations

Table 2 gives the descriptive statistics of the main variables. The mean of earnings transparency ($TRANS_{i,t}$) was –0.121 and the median was –0.032. The total grade of sustainability management ($TOTAL\_SCORE_{i,t}$) is 7.240 and the median is 7. The average grade of corporate governance ($GOV\_SCORE_{i,t}$) is 6.622 and the median is 7. The average grade of social responsibility activities ($SOC\_SCORE_{i,t}$) is 7.320 and the middle level is 7. The average grade of $ENV\_SCORE_{i,t}$ is 7.356 and the median is 7. On the whole, there were many companies that received a rank of B or below, suggesting that the CSM activities are still insufficient. The average of those belonging to a chaebol ($CHAEBOL_{i,t}$) was 0.267, and about 27% of the sample belonged to a large enterprise group. Firm size ($SIZE_{i,t}$) has the mean and median values of 27.139 and 26.923, the average debt-to-equity ratio ($LEV_{i,t}$) is 0.474, and the median is 0.480. Intangible assets ($INTAN_{i,t}$) averaged 0.036, with 3.6% of total assets comprising intangible assets. Growth rate ($GRW_{i,t}$) has an average of about 7%, and firm age ($AGE_{i,t}$) has an average of 2.964. The market value to book value ratio ($MTB_{i,t}$) has an average of 1.237. Table 2, Panel B presents the univariate tests for the dependent variables and control variables. We tested the mean and the median for the earnings transparency variable between chaebol and non-chaebol firms. The difference was statistically significant in both cases at the 1% level, providing support for our main hypothesis and suggesting that chaebol firms have greater transparency than non-chaebol firms. We also studied the difference in control variables between chaebol and non-chaebol firms. The results showed that chaebol firms had better CSR activities.

Table 2. Descriptive statistics and univariate tests.

PANEL A. Descriptive statistics								
Variable	N	Mean	Std.	Min	25%	Median	75%	Max
$TRANS_{i,t}$	3,934	−0.121	0.332	−3.899	−0.102	−0.032	−0.006	0.000
$TOTAL\_SCORE_{i,t}$	3,934	7.240	0.569	7.000	7.000	7.000	7.000	10.000
$GOV\_SCORE_{i,t}$	3,934	6.622	1.210	5.000	5.000	7.000	7.000	10.000
$SOC\_SCORE_{i,t}$	3,934	7.320	0.692	7.000	7.000	7.000	7.000	10.000
$ENV\_SCORE_{i,t}$	3,934	7.356	0.650	7.000	7.000	7.000	8.000	10.000
$CHAEBOL_{i,t}$	3,934	0.267	0.442	0.000	0.000	0.000	1.000	1.000
$SIZE_{i,t}$	3,934	27.139	1.591	24.000	26.024	26.923	28.024	31.478
$LEV_{i,t}$	3,934	0.474	0.199	0.090	0.314	0.480	0.620	0.943
$INTAN_{i,t}$	3,934	0.036	0.066	0.000	0.006	0.014	0.038	0.771
$GRW_{i,t}$	3,934	0.070	0.438	−0.969	−0.021	0.033	0.099	17.209
$AEG_{i,t}$	3,934	2.964	0.718	0.693	2.565	3.178	3.555	4.127
$MTB_{i,t}$	3,934	1.237	1.583	−32.384	0.550	0.855	1.383	32.199
$ROA_{i,t}$	3,934	0.023	0.054	-0.117	0.002	0.027	0.056	0.119
$LOSS_{i,t}$	3,934	0.228	0.420	0.000	0.000	0.000	0.000	1.000
PANEL B. Univariate tests for chaebol versus non-chaebol firms								
Variable	CHAEBOL = 1		NON-CHAEBOL = 0		t-value		Wilcoxon z-value	
	Mean	Median	Mean	Median				
$TRANS_{i,t}$	−0.088	−0.031	−0.131	−0.033	3.91***		1.03	
$TOTAL\_SCORE_{i,t}$	7.703	7.000	7.067	7.000	36.54***		31.93***	
$GOV\_SCORE_{i,t}$	7.303	7.000	6.375	7.000	23.10***		22.90***	
$SOC\_SCORE_{i,t}$	7.896	8.000	7.099	7.000	38.36***		33.08***	
$ENV\_SCORE_{i,t}$	7.828	8.000	7.184	7.000	30.59***		24.91***	
$SIZE_{i,t}$	28.513	28.836	26.557	26.470	48.70***		35.50***	
$LEV_{i,t}$	0.519	0.546	0.453	0.452	10.16***		10.10***	
$INTAN_{i,t}$	0.054	0.024	0.030	0.012	10.56***		12.04***	
$GRW_{i,t}$	0.063	0.041	0.053	0.033	1.58***		1.76*	
$AEG_{i,t}$	2.758	2.996	2.909	3.178	5.18***		3.73***	

$MTB_{i,t}$	1.183	0.897	1.263	0.842	1.48	1.86*
$ROA_{i,t}$	0.028	0.027	0.021	0.026	3.80***	2.02**
$LOSS_{i,t}$	0.182	0.000	0.245	0.000	4.41***	4.40***

Variable definitions: $TRANS_{i,t}$ is earnings transparency, which is measured by Cheng and Subramanyam [18] for firm *i* in year *t*; $TOTAL\_SCORE_{i,t}$ is the corporate sustainability management grade for integration sector, which is one of the ESG (Environmental, Social, and Governance) ratings of KCGS (Korean Corporate Governance Service); $GOV\_SCORE_{i,t}$ is the corporate sustainability management grade for the corporate governance sector; $SOC\_SCORE_{i,t}$ is the corporate sustainability management grade for the corporate social responsibility sector; $ENV\_SCORE_{i,t}$ is the corporate sustainability management grade for the environmental sector; $CHAEBOL_{i,t}$ is an indicator variable: If a firm belongs to a chaebol, it takes the value of 1, and 0 otherwise; $SIZE_{i,t}$ is the natural logarithm of total assets; $LEV_{i,t}$ is the financial leverage, determined by the ratio of total debt to total assets; $INTAN_{i,t}$ is the intangible asset divided by total assets; $GRW_{i,t}$ is the growth rate, which is measured as (total assets for firm *i* in year *t* − lagged total assets)/lagged total assets; $AGE_{i,t}$ is the natural logarithm of firm age; $MTB_{i,t}$ is the market value of equity divided by the book value of equity. $ROA_{i,t}$ is return on assets, which is measured as pretax income in year *t* divided by lagged total assets. $LOSS_{i,t}$ is an indicator variable that takes a value of 1 if a firm reports a loss (net income < 0), and 0 otherwise. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively.

Table 3 shows the Pearson correlation analysis of the main variables. $TRANS_{i,t}$ has a significantly positive relationship with sustainability management activities ($TOTAL\_SCORE_{i,t}$, $GOV\_SCORE_{i,t}$, $SOC\_SCORE_{i,t}$, $ENV\_SCORE_{i,t}$), $CHAEBOL_{i,t}$, and $SIZE_{i,t}$. This means that the greater the sustainability management activities, the more likely a firm is to belong to a chaebol, the larger the size of the firm, and the higher the earnings transparency. The relationships between sustainability management activities ($TOTAL\_SCORE_{i,t}$, $GOV\_SCORE_{i,t}$, $SOC\_SCORE_{i,t}$, $ENV\_SCORE_{i,t}$) and the dependent variable, $TRANS_{i,t}$, are 0.069, 0.080, 0.055, and 0.076, respectively. This is consistent with our hypothesis that earnings transparency is more likely to be driven by sustainability management activities, although other characteristics of earnings transparency are uncontrolled. On the other hand, the relationship between earnings transparency ($TRANS_{i,t}$) and the growth rate ($GRW_{i,t}$) and market value to book value ratio ($MTB_{i,t}$) shows a significantly negative relationship. The larger the growth rate, the larger the market value is, and the lower the earnings transparency. Since the above results do not control the influence of other variables on earnings transparency, we perform a multiple regression analysis, including various control variables.

Table 3. Correlations among the variables.

	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) $TRANS_{i,t}$	0.069	0.081	0.055	0.076	0.059	0.083	−0.005	−0.016	−0.098	−0.014	**−0.225**	−0.026	0.038
(2) $TOTAL\_SCORE_{i,t}$		0.518	0.840	0.759	0.498	0.585	0.119	0.147	0.022	−0.034	0.045	0.071	−0.039
(3) $GOV\_SCORE_{i,t}$			0.397	0.350	0.339	0.432	−0.005	0.105	0.006	−0.108	−0.002	0.148	−0.124
(4) $SOC\_SCORE_{i,t}$				0.662	0.516	0.582	0.112	0.166	0.024	−0.014	0.071	0.097	−0.063
(5) $ENV\_SCORE_{i,t}$					0.439	0.582	0.146	0.074	−0.014	0.012	−0.007	0.043	−0.024
(6) $CHAEBOL_{i,t}$						0.593	0.152	0.158	0.024	−0.078	−0.022	0.057	−0.066
(7) $SIZE_{i,t}$							0.264	0.145	0.094	0.020	**−0.061**	0.143	−0.137
(8) $LEV_{i,t}$								0.021	0.007	0.050	0.008	−0.389	0.295
(9) $INTAN_{i,t}$									0.104	− 0.077	0.110	−0.036	0.007
(10) $GRW_{i,t}$										− 0.079	0.111	0.227	−0.192
(11) $AEG_{i,t}$											−0.111	−0.153	0.116
(12) $MTB_{i,t}$												0.078	0.003
(13) $ROA_{i,t}$													−0.765
(14) $LOSS_{i,t}$													1.000

Notes: This table presents Pearson correlations. Coefficients shown in bold are significant at *p* < 0.05 (two-tailed test). Please see Table 2 for variable definitions.

4.2. Multivariate Results

4.2.1. Corporate Sustainability Management and Earnings Transparency (H1)

We examine whether the corporate sustainability management positively affects the earnings transparency of a firm. Table 4 shows the regression analysis of Equation (1) for the relationship between corporate sustainability management and earnings transparency. As a result of the analysis, the F value is significant at the 1% level, so the regression model is appropriate. The regression analysis of the independent variable used in this study showed that the variance expansion index (VIF) is not serious. The coefficients (β_1) of $CSM_{i,t}$ (TOTAL_SCORE, GOV_SCORE, SOC_SCORE, ENV_SCORE) that show the effect of corporate sustainability management on earnings transparency are 0.035, 0.016, 0.017, and 0.026, which are significant at 1%, 1%, 5%, and 1%, respectively. In other words, the empirical results show that the greater the sustainability management activities, the higher the earnings transparency. These results support Hypothesis 1. This is in line with previous studies that suggested that sustainability management activities reduce earnings management and corporate risk and increase firm value [10–14].

Table 4. The relevance of corporate sustainability management and earnings transparency.

$$TRANS_{i,t} = \beta_0 + \beta_1 CSM_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 INTAN_{i,t} + \beta_5 GRW_{i,t}$$
$$+ \beta_6 AGE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 ROA_{i,t} + \beta_9 LOSS_{i,t} + \sum YD + \sum ID + \varepsilon_{i,t}$$

Variables	Expected Sign	CSM = TOTAL_SCORE		CSM = GOV_SCORE	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		−0.531	−3.512**	−0.476	−3.294**
$CSM_{i,t}$	(+)	0.028	2.643**	0.016	3.083**
$SIZE_{i,t}$	(+)	0.015	2.778**	0.016	3.469**
$LEV_{i,t}$	(+/−)	−0.065	−2.358*	−0.061	−2.685**
$INTAN_{i,t}$	(−)	−0.026	−0.281	−0.025	−0.276
$GRW_{i,t}$	(+/−)	−0.147	−4.134***	−0.143	−4.108***
$AGE_{i,t}$	(+/−)	−0.014	−5.784***	−0.011	−9.606***
$MTB_{i,t}$	(+/−)	−0.050	−6.979***	−0.047	−6.741***
$ROA_{i,t}$	(+)	0.265	1.661	0.178	0.984
$LOSS_{i,t}$	(+/−)	0.067	2.491**	0.068	2.560**
YD		Included		Included	
ID		Included		Included	
F-value		4.11***		3.84***	
Adj.R²		8.30%		7.95%	
Variables	**Expected Sign**	**CSM = SOC_SCORE**		**CSM = ENV_SCORE**	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		−0.514	−3.340**	−0.480	−3.254**
$CSM_{i,t}$	(+)	0.016	2.543**	0.020	2.521**
$SIZE_{i,t}$	(+)	0.017	3.377**	0.015	2.736**
$LEV_{i,t}$	(+/−)	−0.066	−2.311*	−0.060	−2.424*
$INTAN_{i,t}$	(−)	−0.034	−0.368	−0.019	−0.206
$GRW_{i,t}$	(+/−)	−0.145	−4.033***	−0.165	−3.848***
$AGE_{i,t}$	(+/−)	−0.015	−5.570***	−0.017	−3.903***
$MTB_{i,t}$	(+/−)	−0.049	−6.853***	−0.049	−6.658***
$ROA_{i,t}$	(+)	0.258	1.569	0.274	1.553
$LOSS_{i,t}$	(+/−)	0.069	2.531**	0.062	2.405*
YD		Included		Included	
ID		Included		Included	
F-value		3.92***		4.09***	
Adj.R²		8.20%		8.50%	

Note: This table reports the regression results for Hypothesis 1 using the firm and year clustering test of Gow et al. [28]. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively. Please see Table 2 for variable definitions.

4.2.2. Corporate Sustainability Management, Earnings Transparency, and Chaebols (H2)

Table 5 shows the results of the regression analysis of Equation (2) on the effect of chaebols on the relationship between corporate sustainability management and earnings transparency. The coefficients (β_1) of $CSM_{i,t}$ (TOTAL_SCORE, GOV_SCORE, ENV_SCORE), which indicate the relationship between sustainability management and earnings transparency, were 0.081, 0.020, and 0.046, which are significant at 1%. The coefficient (β_1) of $CSM_{i,t}$ (SOC_SCORE) was 0.047, indicating a positive direction, but not significant. The coefficients (β_3) of $CSM \times CHAEBOL_{i,t}$ (TOTAL_SCORE×CHAEBOL, GOV_SCORE×CHAEBOL, SOC_SCORE×CHAEBOL, ENV_SCORE×CHAEBOL), which is the interaction variable between sustainability management and $CHAEBOL_{i,t}$, were −0.059, −0.013, −0.042, and −0.031, which were significantly negative at 5%, 10%, 5%, and 10%. The empirical results indicate that firms that belong to a chaebol are less likely to have a positive relationship between CSM and earnings transparency. In other words, since firms belonging to a chaebol have a lower information asymmetry than firms not belonging to a chaebol, the relationship between CSM and earnings transparency is less pronounced. These results indirectly show that firms that belong to a chaebol have a higher earnings transparency level than firms that do not belong to a chaebol.

Table 5. The effect of chaebols on the relationship between corporate sustainability management and earnings transparency.

$$TRANS_{i,t} = \beta_0 + \beta_1 CSM_{i,t} + \beta_2 CHAEBOL_{i,t} + \beta_3 CSM \times CHAEBOL_{i,t} + \beta_4 SIZE_{i,t}$$
$$+ \beta_5 LEV_{i,t} + \beta_6 INTAN_{i,t} + \beta_7 GRW_{i,t} + \beta_8 AGE_{i,t} + \beta_9 MTB_{i,t}$$
$$+ \beta_{10} ROA_{i,t} + \beta_{11} LOSS_{i,t} + \sum YD + \sum ID + \varepsilon_{i,t}$$

Variables	Expected Sign	CSM = TOTAL_SCORE		CSM = GOV_SCORE	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		−0.865	−3.991***	−0.532	−3.700***
$CSM_{i,t}$	(+)	0.074	2.620**	0.020	3.120**
$CHAEBOL_{i,t}$	?	0.418	2.135**	0.091	1.955*
$CSM \times CHAEBOL_{i,t}$	(+/−)	−0.059	−2.518**	−0.013	−2.062**
$SIZE_{i,t}$	(+)	0.015	2.855**	0.017	3.491**
$LEV_{i,t}$	(+/−)	−0.066	−2.371**	−0.060	−2.737**
$INTAN_{i,t}$	(−)	−0.015	−0.163	−0.016	−0.164
$GRW_{i,t}$	(+/−)	−0.146	−4.092***	−0.143	−4.028***
$AGE_{i,t}$	(+/−)	−0.013	−5.235 ***	−0.011	−7.813***
$MTB_{i,t}$	(+/−)	−0.050	−6.900***	−0.047	−6.733***
$ROA_{i,t}$	(+)	0.261	1.602	0.178	0.989
$LOSS_{i,t}$	(+/−)	0.068	2.517**	0.069	2.633**
YD		Included		Included	
ID		Included		Included	
F-value		4.00***		3.85***	
Adj.R²		8.43%		8.00%	
Variables	Expected Sign	CSM = SOC_SCORE		CSM = ENV_SCORE	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		−0.709	−4.291***	−0.593	−3.160**
$CSM_{i,t}$	(+)	0.043	4.126***	0.036	2.786***
$CHAEBOL_{i,t}$	?	0.254	3.496**	0.181	2.510**
$CSM \times CHAEBOL_{i,t}$	(+/−)	−0.035	−3.570**	−0.025	−2.580**
$SIZE_{i,t}$	(+)	0.017	3.417**	0.015	2.963**
$LEV_{i,t}$	(+/−)	−0.067	−2.339**	−0.061	−2.502**
$INTAN_{i,t}$	(−)	−0.025	−0.266	−0.013	−0.141
$GRW_{i,t}$	(+/−)	−0.143	−3.960**	−0.163	−3.796***
$AGE_{i,t}$	(+/−)	−0.014	−4.822**	−0.017	−3.821***
$MTB_{i,t}$	(+/−)	−0.050	−6.763***	−0.049	−6.656***
$ROA_{i,t}$	(+)	0.247	1.500	0.267	1.511
$LOSS_{i,t}$	(+/−)	0.068	2.523**	0.061	2.388*
YD		Included		Included	

ID		Included	Included
F-value		3.84***	3.84***
Adj.R²		8.27%	8.59%

Note: This table reports the regression results for Hypothesis 2 using the firm and year clustering test of Gow et al. [28]. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively. Please see Table 2 for variable definitions.

4.3. Additional Analysis

4.3.1. Analysis Using Incremental Variables

Table 6 shows the regression analysis of Equation (1) for the relationship between corporate sustainability management and earnings transparency using incremental variables. The F value is significant at the 1% level, so the regression model is appropriate. The coefficients (β_1) of $\Delta CSM_{i,t}$ (ΔTOTAL_SCORE, ΔSOC_SCORE, ΔENV_SCORE) that show the effect of corporate sustainability management on earnings transparency are 0.033, 0.019, and 0.024, which are significant at 5%, 10%, and 10%, respectively. The coefficient (β_1) of $\Delta CSM_{i,t}$ (ΔGOV_SCORE) is 0.006, indicating a positive direction, but not significant. The empirical results show that the greater the sustainability management activities, the higher the earnings transparency. Among the four variables of CSM activity, there is no statistical significance for corporate governance activity because the improvement level of corporate governance is relatively weak.

Table 6. The results for Hypothesis 1 using incremental variables.

$$\Delta TRANS_{i,t} = \beta_0 + \beta_1 \Delta CSM_{i,t} + \beta_2 \Delta SIZE_{i,t} + \beta_3 \Delta LEV_{i,t} + \beta_4 \Delta INTAN_{i,t} + \beta_5 \Delta GRW_{i,t} + \beta_6 \Delta AGE_{i,t} + \beta_7 \Delta MTB_{i,t} + \beta_8 \Delta ROA_{i,t} + \beta_9 LOSS_{i,t} + \sum YD + \sum ID + \varepsilon_{i,t}$$

Variables	Expected Sign	ΔCSM = ΔTOTAL_SCORE		ΔCSM = ΔGOV_SCORE	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		0.019	0.680	0.023	0.020
$\Delta CSM_{i,t}$	(+)	0.030	1.980**	0.006	1.210
$\Delta SIZE_{i,t}$	(+)	0.009	0.730	0.004	1.170
$\Delta LEV_{i,t}$	(+/−)	−0.076	−0.940	−0.005	−0.560
$\Delta INTAN_{i,t}$	(−)	0.154	0.750	0.158	0.990
$\Delta GRW_{i,t}$	(+/−)	−0.099	−2.850***	−0.021	−3.110***
$\Delta AGE_{i,t}$	(+/−)	−0.046	−1.230	−0.042	−1.500
$\Delta MTB_{i,t}$	(+/−)	−0.052	−11.200***	−0.050	−10.710***
$\Delta ROA_{i,t}$	(+)	−0.175	−1.000	−0.052	−1.570
$LOSS_{i,t}$	(+/−)	0.027	1.360	0.420	1.230
YD		Included		Included	
ID		Included		Included	
F-value		5.97***		16.28***	
Adj.R²		3.68%		3.42%	

Variables	Expected Sign	ΔCSM = ΔSOC_SCORE		ΔCSM = ΔENV_SCORE	
		Coefficient	*t*-value	Coefficient	*t*-value
Intercept		0.011	0.940	0.029	0.990
$\Delta CSM_{i,t}$	(+)	0.016	1.670*	0.022	1.680*
$\Delta SIZE_{i,t}$	(+)	0.009	0.780	−0.001	−0.060
$\Delta LEV_{i,t}$	(+/−)	−0.065	−0.810	−0.048	−0.540
$\Delta INTAN_{i,t}$	(−)	0.237	1.170	0.219	1.020
$\Delta GRW_{i,t}$	(+/−)	−0.095	−2.770***	−0.107	−3.050
$\Delta AGE_{i,t}$	(+/−)	−0.045	−1.220	−0.042	−1.050
$\Delta MTB_{i,t}$	(+/−)	−0.051	−11.170***	−0.050	−10.840***
$\Delta ROA_{i,t}$	(+)	−0.170	−0.980	−0.218	−1.190
$LOSS_{i,t}$	(+/−)	0.022	1.150	0.017	0.880

YD	Included	Included	
ID	Included	Included	
F-value	12.83***	5.83***	
Adj.R²	3.88%	3.78%	

Note: This table reports the effect of corporate sustainability management on the earnings transparency using incremental variables. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively. Please see Table 2 for variable definitions.

4.3.2. Subsamples of Chaebols and Non-Chaebols

Table 7 provides retest results for Hypothesis 1 using subsamples of chaebols and non-chaebols. Chaebols have stronger post-regulation and market monitoring compared to the non-chaebols. In addition, outside stakeholders demand more detailed and accurate information about chaebols [15]. Thus, the effect of sustainability management activities is expected to be greater in a group with a high level of information asymmetry. In other words, the positive effect of corporate sustainability management on earnings transparency will be strong in non-chaebols.

Table 7. The results for Hypothesis 1 using subsamples of chaebols and non-chaebols.

$$TRANS_{i,t} = \beta_0 + \beta_1 CSM_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 INTAN_{i,t} + \beta_5 GRW_{i,t} + \beta_6 AGE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 ROA_{i,t} + \beta_9 LOSSDUM_{i,t} + \sum YD + \sum ID + \varepsilon_{i,t}$$

		Panel A: Chaebol			
		TOTAL_SCORE	GOV_SCORE	SOC_SCORE	ENV_SCORE
Variables	**Expected Sign**	Coefficient	Coefficient	Coefficient	Coefficient
		(*t*-value)	(*t*-value)	(*t*-value)	(*t*-value)
Intercept		−0.246	−0.224	−0.392	−0.239
		(−1.740)*	(−1.600)	(−3.000)***	(−1.670)*
$CSM_{i,t}$	(+)	0.012	0.010	−0.003	0.010
		(1.230)	(1.780)*	(−0.340)	(1.100)
$SIZE_{i,t}$	(+)	0.003	0.003	0.012	0.004
		(0.560)	(0.480)	(2.150)**	(0.570)
$LEV_{i,t}$	(+/−)	0.043	0.041	0.050	0.043
		(0.950)	(0.910)	(1.180)	(0.930)
$INTAN_{i,t}$	(−)	0.012	0.011	0.029	0.021
		(0.150)	(0.140)	(0.390)	(0.260)
$GRW_{i,t}$	(+/−)	-0.015	-0.012	-0.013	-0.022
		(-0.370)	(-0.290)	(-0.340)	(-0.560)
$AGE_{i,t}$	(+/−)	−0.005	−0.002	−0.008	−0.005
		(−0.580)	(−0.200)	(−1.010)	(−0.580)
$MTB_{i,t}$	(+/−)	−0.011	−0.010	−0.012	−0.010
		(−2.750)***	(−2.590)***	(−3.250)***	(−2.640)***
$ROA_{i,t}$	(+)	0.168	0.164	0.258	0.179
		(0.770)	(0.750)	(1.200)	(0.810)
$LOSS_{i,t}$	(+/−)	0.011	0.012	0.020	0.009
		(0.490)	(0.520)	(0.910)	(0.400)
YD		Included	Included	Included	Included
ID		Included	Included	Included	Included
F-value		3.25***	3.28***	3.54***	3.15***
Adj.R²		8.33%	5.81%	4.79%	8.22%
		Panel B: Non-Chaebol			
		TOTAL_SCORE	GOV_SCORE	SOC_SCORE	ENV_SCORE
Variables	**Expected Sign**	Coefficient	Coefficient	Coefficient	Coefficient
		(*t*-value)	(*t*-value)	(*t*-value)	(*t*-value)

Intercept		−0.915	−0.542	−0.788	−0.559
		(−4.200)***	(−3.040) ***	(−4.150)***	(−2.410)**
$CSM_{i,t}$	(+)	0.082	0.021	0.051	0.038
		(3.250)***	(3.350)***	(2.590)***	(2.790)***
$SIZE_{i,t}$	(+)	0.017	0.019	0.018	0.016
		(2.320)**	(2.780) ***	(2.620)***	(1.050)
$LEV_{i,t}$	(+/−)	−0.084	−0.077	−0.081	−0.078
		(−2.080)**	(−1.920) *	(−2.100)**	(−0.750)
$INTAN_{i,t}$	(−)	−0.062	−0.058	−0.002	−0.071
		(−0.510)	(−0.480)	(−0.010)	(−0.690)
$GRW_{i,t}$	(+/−)	−0.174	−0.173	−0.173	−0.196
		(−4.440)***	(−4.440)***	(−4.490)***	(−2.930)***
$AGE_{i,t}$	(+/−)	−0.013	−0.011	−0.019	−0.019
		(−1.410)	(−1.190)	(−2.020)**	(−1.590)
$MTB_{i,t}$	(+/−)	−0.069	−0.066	−0.064	−0.067
		(−15.050)***	(−14.370)***	(−14.390)***	(−14.910)***
$ROA_{i,t}$	(+)	0.261	0.179	0.268	0.267
		(1.310)	(0.910)	(1.360)	(0.810)
$LOSS_{i,t}$	(+/−)	0.090	0.092	0.086	0.082
		(3.760) ***	(3.920) ***	(3.650) ***	(0.400)
YD		Included	Included	Included	Included
ID		Included	Included	Included	Included
F-value		11.16***	12.34***	22.86***	12.68***
Adj.R²		12.75%	10.66%	10.34%	11.41%

Note: This table reports the regression results for Hypothesis 1 using subsamples of chaebols and non-chaebols. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively. Please see Table 2 for variable definitions.

Panel A in Table 7 shows the regression analysis results for firms belonging to a chaebol. The coefficients ($β_1$) of $CSM_{i,t}$ (GOV_SCORE) that show the effect of corporate sustainability management on earnings transparency are 0.011, which are significant at 10%. However, the coefficients ($β_1$) of remaining $CSM_{i,t}$ (TOTAL_SCORE, SOC_SCORE, ENV_SCORE) are not significant. Panel B in Table 7 shows the regression analysis results for firms not belonging to a chaebol. The coefficients ($β_1$) of $CSM_{i,t}$ (TOTAL_SCORE, GOV_SCORE, SOC_SCORE, ENV_SCORE) that show the effect of corporate sustainability management on earnings transparency are 0.092, 0.019, 0.058, and 0.050, which are significant at 1%.

In summary, the results of this study indicate that firms belonging to a chaebol are less likely to have a positive relationship with earnings transparency than those who do not. In other words, firms belonging to a chaebol have a higher earnings transparency than firms not belonging to a chaebol, so the effect of sustainability management activity on earnings transparency is minimal.

4.3.3. Subsamples of the Profit and Loss Groups

Kim et al. [10] report that there is a negative relationship between corporate sustainability and earnings management. Since a firm's behavior may be affected by profit or loss, they divided the firms into a profit group (net income > 0) and a loss group (net income < 0). Like in the previous study, this study performs additional analysis using subsamples of the profit and loss groups. Table 8 provides the retest results for Hypothesis 1 using subsamples of the profit and loss groups. The results show that the effect of corporate sustainability management on earnings transparency is stronger in the profit group than in the loss group. These results seem to be attributable to the difference between the earnings persistence of the profit and loss groups [29].

Table 8. The results for Hypothesis 1 using subsamples of the profit and loss groups.

$$TRANS_{i,t} = \beta_0 + \beta_1 CSM_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 INTAN_{i,t} + \beta_5 GRW_{i,t}$$
$$+ \beta_6 AGE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 ROA_{i,t} + \sum YD + \sum ID + \varepsilon_{i,t}$$

		Panel A: Profit Firm (net income > 0)			
		TOTAL_SCORE	**GOV_SCORE**	**SOC_SCORE**	**ENV_SCORE**
Variables	**Expected Sign**	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
		(*t*-value)	(*t*-value)	(*t*-value)	(*t*-value)
Intercept		−0.615	−0.575	−0.595	−0.541
		(−4.860)***	(−4.580)***	(−4.910)***	(−4.230)***
$CSM_{i,t}$	(+)	0.043	0.021	0.027	0.032
		(3.230)***	(3.780)***	(2.510)**	(2.680)***
$SIZE_{i,t}$	(+)	0.016	0.020	0.017	0.016
		(2.800)***	(3.900)***	(3.190)***	(2.810)***
$LEV_{i,t}$	(+/−)	−0.163	−0.042	−0.051	−0.056
		(−1.540)	(−1.040)	(−1.310)	(−1.370)
$INTAN_{i,t}$	(−)	−0.059	−0.047	−0.060	−0.030
		(−0.570)	(−0.450)	(−0.610)	(−0.290)
$GRW_{i,t}$	(+/−)	−0.131	−0.154	−0.147	−0.154
		(−3.340)***	(−3.920)***	(−3.760)***	(−3.920)***
$AGE_{i,t}$	(+/−)	−0.020	−0.016	−0.026	−0.023
		(−2.340)**	(−1.850)*	(−3.160)***	(−2.720)***
$MTB_{i,t}$	(+/−)	−0.090	−0.089	−0.083	−0.090
		(−16.240)***	(−15.840)***	(−15.380)***	(−16.100)***
$ROA_{i,t}$	(+)	1.003	0.958	0.946	1.031
		(4.410) ***	(4.250)***	(4.210) ***	(4.500)***
YD		Included	Included	Included	Included
ID		Included	Included	Included	Included
F-value		14.11***	14.16***	26.56***	14.17***
Adj.R²		10.56%	10.44%	10.28%	10.87%
		Panel B: Loss Firm (net income < 0)			
		TOTAL_SCORE	**GOV_SCORE**	**SOC_SCORE**	**ENV_SCORE**
Variables	**Expected Sign**	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
		(*t*-value)	(*t*-value)	(*t*-value)	(*t*-value)
Intercept		−0.249	−0.179	−0.349	−0.268
		(−1.410)	(−1.050)	(−2.090)***	(−1.460)
$CSM_{i,t}$	(+)	−0.016	0.005	−0.029	−0.015
		(−0.750)	(0.630)	(−1.680)*	(−0.780)
$SIZE_{i,t}$	(+)	0.010	0.001	0.016	0.011
		(1.140)	(0.210)	(2.110)***	(1.170)
$LEV_{i,t}$	(+/−)	0.090	0.093	0.083	0.104
		(1.750)*	(1.960)*	(1.700)	(1.950)*
$INTAN_{i,t}$	(−)	0.161	0.120	0.168	0.151
		(1.380)	(1.120)	(1.520)	(1.270)
$GRW_{i,t}$	(+/−)	−0.152	−0.088	−0.139	−0.168
		(−3.590)***	(−2.150)**	(−3.350)***	(−3.830)***
$AGE_{i,t}$	(+/−)	0.002	0.004	0.004	−0.002
		(0.130)	(0.350)	(0.290)	(−0.130)
$MTB_{i,t}$	(+/−)	−0.022	−0.019	−0.021	−0.021
		(−6.160)***	(−5.720)***	(−5.840)***	(−5.940)***
$ROA_{i,t}$	(+)	0.150	0.127	0.246	0.162
		(0.680)	(0.610)	(0.256)	(0.710)
YD		Included	Included	Included	Included

ID	Included	Included	Included	Included
F-value	5.11***	4.35***	7.72***	5.02***
Adj.R²	10.99%	9.11%	9.10%	11.01%

Note: This table reports the regression results for Hypothesis 1 using subsamples of the profit and loss groups. ***, **, and * represent significance at the 0.01, 0.05, and 0.1 level, respectively. Please see Table 2 for variable definitions.

5. Conclusions

Recently, corporate sustainability management has become mandatory, not optional; firms must pay attention not only to financial performance, but also to non-financial performance measures, such as the environment, ethics, and social issues. Corporate sustainability management can be defined as management activities that strive toward sustainable development of the environment, economy, and society, while at the same time minimizing the risk and enhancing the value of an enterprise, including shareholder value [2]. Therefore, we are interested in the effects of corporate sustainability management. This study examines the association of corporate sustainability management with earnings transparency. This study also examines the differential relationship between CSM and earnings transparency according to whether or not a firm belongs to a chaebol. We used the ESG ratings of the KCGS as a measure of corporate sustainability management and applied Cheng's and Subramanyam's [18] method to measure earnings transparency.

Our results showed a significantly positive relationship between corporate sustainability management and earnings transparency. Specifically, all four sectors of ESG (integration, governance, social, and environmental) had significantly positive values, meaning that firms with effective sustainability management activities have a higher earnings transparency. Sustainability management shows that it is not a waste of resources, but an investment in a company. This is explained by increasing the value of the company from the perspective of the stakeholder and the agency. The more active the engagement in sustainability management, the higher the quality of earnings reflected in the financial statements. In addition, this showed the result of increasing earnings transparency, which is measured by the stock price explanation power reflected in the capital market. Furthermore, the interaction between sustainability management and affiliation with a chaebol is significantly negative. These results show that, since firms belonging to a chaebol have a lower information asymmetry than firms that do not belong to a chaebol, the relationship between their CSM and earnings transparency is less pronounced.

Accounting transparency can be defined as providing accounting information with qualitative attributes of financial reporting to information users. However, since the concept of accounting transparency is impossible to observe, it is difficult to measure the accounting transparency of individual companies. In contrast, stock returns reflect the changes in a company's economic value because earnings transparency is assessed by profit relative to the stock's rate of return and the explanatory power of the change in earnings. Therefore, it can be said that earnings transparency measured by the evaluation of the capital market on profit information is an objective measure [15]. Due to the absence of an objective substitute for accounting transparency, studies on accounting transparency have been insufficient. This study contributes to the examination of the relationship between sustainability management and earnings transparency by taking earnings transparency, a more specific measure than accounting transparency, as a dependent variable.

The economic importance of business groups is very significant worldwide. In particular, in the case of Korea, the governance system of a chaebol formed around a specific household is not only unique, but has also had a profound effect on Korea's economic management. There is a positive evaluation that a chaebol system has been a leading driver of the economy, and a negative evaluation that a large shareholder-centered closed corporate governance structure hinders the balanced development of the economy. A study on how a chaebol's corporate governance structure affects the efficiency of business operation and how the effect is reflected in the capital market will be an important basis for establishing Korea's chaebol policy in the future. However, despite this importance, the available research is still considered insufficient to reach a conclusion. This study is

different in that it looked at the effects of firms' chaebol affiliations in relation to their sustainability management and earnings transparency.

This study examined the relationship between sustainability management and earnings transparency at a time when interest in sustainability management has increased and social demands have increased domestically and internationally. In other words, the significance can be found in that it empirically analyzes whether the components of sustainability, which are external ethical behaviors of companies, are consistent with earnings transparency, which is an internal ethical behavior. Our results also contribute to the literature on corporate sustainability management by presenting evidence that corporate sustainability management is related to earnings transparency. In addition, it is meaningful that we directly examine the relationship between sustainability management and earnings transparency according to whether firms belong to a chaebol. This study has a practical implication in that investors can consider that firms with effective sustainability activities have high transparency, and financial analysts can consider sustainability indicators when evaluating firms. In addition, an external auditor can perform auditing procedures in view of the fact that they report earnings transparently when auditing firms with effective sustainability management. The value relevance of non-financial information such as sustainability management has been confirmed, so authorities will need to encourage institutional arrangements for the disclosure of non-financial information, such as social responsibility.

The limitations of this study are as follows. First, it does not take into consideration all of the various indicators of earnings transparency and the problem of additional omitted variables that affect earnings transparency. Second, the majority of firms with low ratings for corporate sustainability management involve sample selection bias. Third, the endogenous problem was considered when employing the incremental effect of the sustainability management grade, but there is still an endogenous problem between sustainability management and earnings transparency. In addition, research on the calculation of CSM indicators considering various stakeholders and research on various measures that can reflect earnings transparency are expected to be necessary.

It is significant that this study considered the usefulness of sustainability management activities and the possibility of reflection in financial statements. Academic research related to the presentation of financial statements of sustainability activities, measurement of sustainability activities, disclosure, etc. may be conducted. Further research should study the relationship between CSM and earnings transparency using a comprehensive data set that includes emerging markets. Future studies could examine the relationship between a firm's earnings transparency, CSM activities, and firm value, and could also examine the mediating effect of corporate governance on the relationship between CSM and firm value.

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