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A Study on Earnings Management in Companies Achieving Sustainability: Accruals-based and Real Earnings Management

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Abstract

Purpose - We attempted to verify the level of ethics of firms achieving sustainable management from the aspect of reliability of accounting information. Specifically, we evaluated the effects of sustainable management on accruals-based earning management (AEM) and real earning management (REM).

Research design, data, and methodology - We employed the issuance of sustainability reports in addition to the indices of social responsibility and environmental-management evaluation of the Korea Corporate Governance Service in order to measure sustainability management. AEM was measured using discretionary accruals and calculated using the operant Jones model. Specifically, REM was measured using the methodology suggested by prior studies. The sample of our study consisted of 1,418 years of public listed firms in the Korea Stock Exchange from 2015 to 2017.

Results - First, the level of AEM in firms achieving sustainable management was lower than the other. Second, the level of REM in these firms was lower than the other. Nonetheless, another analysis showed that the level of governance control affects the level of earning management and that the levels of AEM and REM were generally lower in firms achieving sustainable management than the others.

Conclusions - We expected that firms achieving external ethics tend to have a higher level of internal ethics than others.

Keywords: Corporate Sustainability Management, Accruals-Based Earnings Management, Real Earnings Management.

JEL Classicifications: L80, M41, M42.

1. Introduction

As environmental issues, such as global warming, have raised the public's concerns, the demands for eco-friendly consumption have been soared; governments have come up with various environment regulations; firms have been responding to the demands and regulations with 'eco-friendly business management.'* Recently, the retail industry has prioritized eco-friendly ethical management and offered a variety of 'eco-friendly' projects in order to hear consumers' sympathy. Specifically, there have been efforts to develop eco-friendly package materials in a step-wise manner. A number of firms have been dedicated to strengthening sustainable eco-friendly business strategies such as consistent enhancement of the process and material for packaging.

Eco-friendly and sustainable management become a major concern and a social responsibility for many firms. In this social atmosphere, sustainable management now becomes a significant factor for consumers' purchase decisions. In effect, 'Good Consumption' promotes the purchase of

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* Eco-friendly management is to introduce and reflect the concept of eco-friendliness onto every management process, from a firm's vision to planning and designing of products, so it is a standard for a corporate's social responsibility and ethical reputation, beyond the scope of simple provision of good products to consumers. It is, now, an indispensable condition for sustainable growth.

products of firms fulfilling social responsibilities and achieving eco-friendly management because consumers have a belief that sustainable management is an indicator of good business. Nevertheless, it is questionable whether a firm achieving sustainable management is always good.

In fact, few studies have focused on whether accounting information of firms conducting sustainable management is more reliable than that of others. Accordingly, we highlight the reliability of accounting information of firms performing sustainable management. Specifically, the level of income-smoothing in firms achieving sustainable management would be addressed from both aspects of accruals-based earning management (hereinafter referred to as AEM) and REM (hereinafter referred to as REM).

Due to the recent growth of the public's interest over corporate sustainability management (hereinafter referred to as CSM), there have been several academic studies. Especially, studies (e.g., Moon, 2007; Kim et al., 2010; Lee, 2011) on the earning management of a firm achieving sustainability have been noted. Still, these studies have solely depended on a single measure of a firm's suitability and verified the measure only from the perspective of AEM.

The purpose of our study is to verify the ethics of firms achieving sustainable management in terms of the reliability of accounting information. Considering that sustainability management is a comprehensive concept for a firm's environmental and social dimensions, it is rather critical to use various measures and to verify both AEM and REM. Accordingly, we use various measures of sustainability management and verify them from the perspective of AEM and REM.

We organize the rest of this manuscript as follows: In the following chapter, we review relevant literature and develop a hypothesis. Next, we report a model and the sample. The results of empirical analysis is then described. Finally, we discuss the significance and limitations of our study.

2. Literature Review and Hypothesis Development

2.1. Literature Review

2.1.1. Sustainable Management

CSM could be defined as a business management approach to sustain its development based on the economic reliability, environmental soundness, and social responsibility. Existing empirical studies on corporates' sustainable management could be roughly divided into two types: the one focusing on the financial performance (or corporate value) of a corporate achieving sustainable management; or the one focusing on the earning management (hereinafter referred to as EM) of a corporate achieving sustainable management (Lee, 2011). As for the first type, first, there were findings that support the traditional perspective of economics that additional expenditure of a corporate for sustainable management has a negative influence over its financial performance and stakeholder value (Spicer, 1978; Vance, 1975). Second, there were also findings that support the perspective of the interested party that a corporate's sustainable management fulfills demands of not only its stakeholders, but also its various interested parties, in turn having a positive influence over the financial performance and stakeholder value (Bragdon & Marlin, 1972; Waddock & Graves, 1997, etc). Since a corporate's sustainable management activities is shown to be directly related with its financial performance in many studies, it could be assumed that the previous researches support the positive influence of suitable management (Lee, 2011). In addition, Moon (2007) investigated the application of ethical management as a proxy for sustainable management and reported that the level of discretionary accruals by an executive officer was lower in firms applied with ethical management and the amount of discretionary accruals was reduced after the introduction of ethical management. Kim et al. (2010) investigated the application of the KEJI of the Korea Economic Justice Research Institute as a proxy for sustainable management and reported that the social index and the amount of discretionary accruals have a negative relation. Lee (2011) reported that there is a negative relation between the initial issuance of a sustainability report and EM in his research where the issuance of a sustainability report was used as a proxy for sustain able management.

2.1.2. Earnings Management

Schipper (1989) defined EM as the purposeful intention of a manager in the external financial reporting process to obtain some private gain. In general, earning management by a manager could be roughly divided into AEM and REM. Specifically, AEM is to manage earnings of a firm by changing an accounting policy or adjusting an estimate while REM is defined as management operational activities to manage earnings of a firm by reducing its sales or cutting its expenses (Yun et al., 2019).

Most studies on earning management in Korea (Hong & Kim, 2011; Park & Kim, 2014; Kwak et al., 2015; Ryu et al., 2016; Lee & Seo, 2017; Lee, 2018; Lee, 2018) focused on AEM. Especially, most of them have reported that managers are likely to engage in AEM by using discretionary accruals under special circumstances (e.g., corporate disclosure, execute compensation, valuation on capital increase, M&A, etc). In contrast, Graham et al. (2005) suggested that managers prefer REM over AEM and that because REM can have a direct influence over a cash flow, it is as significant as AEM. Graham et al. (2005) reported that firms prefer REM because AEM can be more easily monitored by external auditors, government authorities, and regulatory authorities.

Roychowdhury (2006) stated that stakeholders cannot

distinguish earnings adjusted by REM from real earnings, and suggested a REM-related empirical model with which a firm's normal business activities can be differentiated from abnormal ones. Cohen et al. (2008) suggested that REM (having the relatively lower legal expense and responsibility than AEM) has become more widely used for EM after the enforcement of the SOX act. Cohen and Zarowin (2010) reported that managers were more likely to use REM upon recapitalization. Ji (2018) reported that REM was more likely to be occurred in the firms hosting briefing sessions, expecting an investment of the market, than others, to secure the market's trust. Yun et al. (2019) reported that REM occurred in firms in which the influence of a CEO was huge; such tendency could be controlled to a certain extent with the audit. Ji and An (2019) reported that firms seeking for mutual development tend to be less involved in REM than others.

2.2. Hypothesis Development

The purpose of this study was to evaluate the level of earnings management of a company achieving sustainable management from the perspectives of REM and AEM. Thus, this study proposed as follows.

2.2.1. Level of AEM

Previous studies on corporate social responsibility (hereinafter referred to as CSR) (Kim, 2014; Cho & Kim, 2014; Lee & Kim, 2015; Kwon & Park, 2016; Kim, 2016; Kim & Kim, 2018; Kim, 2018; Lee, 2019; Choi, 2018) have reported that the level of earnings management was generally lower in firms achieving sustainable management than others. Accordingly, we might believe that firms having the determination of fulfilling social responsibilities are more ethical than others from the aspect of reliability of accounting information.

Therefore, it is assumed that firms achieving sustainable management are less likely to be engaged in earnings management (EM) which can have a relatively large adverse effect on such firms. Especially, considering that CSR is made for positive external response, regardless whether it is voluntary or not, the firm is more likely to constraint EM as much as possible since the disclosure of engagement in EM could have a significant adverse effect. As firms become more interested in CSM, it would be possible to expect that firms achieving sustainable management would have the higher reliability of accounting information, in turn having the lower level of EM. Thus, it is hypothesized that:

H1: There is an indirect (-) relationship between sustainable management and AEM.

2.2.2. Level of REM

Although extant studies on EM has focused on AEM, firms have been trying to adjust earnings in various ways while avoiding AEM because AEM is perceived as 'manipulation of earnings' and accompanied by legal responsibilities. One way would be REM made through management activities. Because it is not easy to clearly define the scope of normal business activities and of abnormal business activities for REM so REM is considered to be a relatively safe means of EM for managers. In fact, Cohen, Dey & Lys (2008) and Cohen & Zarowin (2010) reported that managers prefer REM over AEM since REM has the lower legal responsibility and expense.

Previous studies on sustainable management reported that the reliability of accounting information is generally higher in firms achieving sustainable management than the others, but till now, there has been no study in Korea, verifying the level of REM in firms achieving sustainable management. Given that firms consider not only REM, but also REM as a means of EM and actually often engage in REM, it would be necessary to verify the level of REM in firms achieving sustainable management. Specifically, given that sustainable management is a management activity, sustainable management is more related with a manager's management activity, so it would be necessary to investigate a relationship between sustainable management and REM. Therefore, the level of REM should be investigated in firms achieving sustainable management and addressed from their internal ethics.

It might be possible to assume that external ethics of firms achieving sustainable management is relatively larger than the others, but it does not necessarily mean that internal ethics of such firms is also high. In fact, many previous studies (Beltratti, 2005; Hemingway & Maclagan, 2004; Jensen & Meckling, 1976; McWilliams & Siegel, 2001; Pava & Krausz, 1996; Prior et al., 2008) reported that managers can make decisions for SCR in order to fulfill the ethical and social responsibilities of firms, but also for the intention of obtaining private gains. Therefore, our study was made under two possible assumptions of the agreement between external and internal ethics, and disagreement between them. In other words, our study was trying to investigate whether the level of REM is lower in firms achieving sustainable management and having the high level of external ethics so they also have the high level of internal ethics, or not. Therefore, it is hypothesized that:

H2: There is a relationship between sustainable management and REM.

3. Research Design

3.1. Sample and Data

Data for our study were drawn from the public listed firm in the KRX covering the period from 2015 to 2017 and satisfying the following conditions: (1) settlement of accounts on December 31, (2) Firms with financial information

available at the database of the Korea Listed Firms Association (TS-2000) and FnGuide, (3) Non-financial industry.

First, financial information of the firms was collected from the database of the Korea Listed Firms Association (TS-2000) and the FnGuide, and the issuance of a sustainability report, the first measure of CSM, was checked with information from the database of the Korea Business Council for Sustainable Development (KBCSD). Second, among the ESG evaluation, the social responsibility management and environmental management index were collected from the database of the Korea Corporate Governance Service. After excluding 47 firm years not obtaining financial information, 272 firm years not obtaining the measure of sustainable management, discretionary accrual, and REM, and 136 firm years with extreme values (average±3*STD) from the initial 1,873 firm years, 1,418 firm years were used for the study. <Table 1> shows the sample selection.

Table 1: Sample Selection

Public Listed Company in the Korea Stock Exchange from 2015~2017, Settlement of Account on December, Non-Financial Industry	1,873
Company not disclosing its financial information at TS-2000 and FnGuide	(47)
Company not disclosing the measure of sustainable management, discretionary accrual, and REM,	(272)
Company in extreme value [Average ±3(STD)]	(136)
No. of Final Samples	1,418

3.1.1. Model

The study model for verifying the levels of AEM and REM in firms achieving sustainable management is as follows. First, its dependent variables are discretionary accruals (DA) and REM (REM). Independent variables are ① issuance of a sustainability report among measures of CSM, and ② social responsibility management and environmental management among measures of ESG. In addition, the SIZE, LEV, CFO, ROA, GRW, OWN, BIG4, and LOSS were included as control variables.

DA, REM,i,t = α1 + α2(CSM) + α3SIZEi,t + α4LEVi,t + α5CFOi,t + α6ROAi,t + α7GRWi,t + α8OWNi,t + α9BIG4i,t + α10LOSSi,t-1 +α11-13YEAR + α14~21IND + Ɛi,t

- Dependent variables : earnings management estimate
(1) DA : discretionary accruals (Dechow et al., 1995)
(2) REM : real earnings management (Roychowdhury, 2006)
REM1 : abnormal operating cash flow *(-1),
REM2 : abnormal production cost,
REM3 : abnormal SG&A*(-1),
REM4 : abnormal production cost+abnormal SG&A*(-1),
REM5 : abnormal operating cash flow*(-1)+ abnormal SG&A*(-1)
REM6 : abnormal operating cash flow*(-1)+ abnormal production cost +bnormal SG&A*(-1)
- Independent variable: corporate sustainability management (CSM)
(1) Issuance of a sustainability report (SR_D)
(2) Social responsibility management (ESG_S) and environmental management (ESG_E) among ESG evaluation
- Control Variables :

SIZE=size of a company, LEV= debt ratio of a company, CFO=cash flow from operating activities, ROA=return on assets, GRW=total asset growth, OWN=major shareholders' share, BIG4= the scale of auditors, LOSS=Loss in a previous quarter, YEAR=year dummy, IND=industry dummy

First, to verify H1, a relationship between CSM and DA (AEM) is examined using the research model above. Herein, it is expected that the higher the level of CSM, the lower the DA, so α2 would have a significant negative value. To verify H2, a relationship between CSM and REM1-6. Herein, if there is a relationship between SCM and REM1-6 ,α2 w would have a significant value.

3.1.2. Operant Definition of Variable

3.1.2.1. Dependent Variable: Earnings Management

(1) AEM : DA

In our study, as the estimation of AEM, a non-discretionary accrual calculated using the operant Jones model (Dechow et al., 1995), the most widely used in the previous studies for the estimation of AEM, was used for the analysis. For this, the operant Jones model is applied to each firm for each industry by using its cross-sectional area to estimate non-discretionary accruals.

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_{1,i}\left(\frac{1}{A_{i,t-1}}\right) + \beta_{2,i}\left(\frac{\triangle REV_{i,t} - \triangle REC_{i,t}}{A_{i,t-1}}\right) + \beta_{3,i}\left(\frac{PPE_{i,t}}{A_{i,t-1}}\right) + \epsilon_{i,t} \quad \text{Eq. (1)}$$

TAi,t = Total Accruals (Net Income – CFO), Ai,t-1 = ROA, REVi,t = Sales, RECi,t = Account Receivable, PPEi,t = Depreciable Fixed Assets

By applying a non-discretionary accrual, estimated using Eq. 1, to estimate a discretionary accrual.

$$\frac{DA_{i,t}}{A_{i,t-1}} = \frac{TA_{i,t}}{A_{i,t-1}} - \left[\widehat{\beta_{1,i}}\left(\frac{1}{A_{i,t-1}}\right) + \widehat{\beta_{2,i}}\left(\frac{\triangle REV_{i,t} - \triangle REC_{i,t}}{A_{i,t-1}}\right) + \widehat{\beta_{3,i}}\left(\frac{PPE_{i,t}}{A_{i,t-1}}\right)\right] \quad \text{Eq. (2)}$$

(2) REM

In our study, the level of REM was estimated by using

the methodology suggested by Roychowdhury (2006) and Cohen and Zarowin (2010). Using the aforementioned methodology, the management of operation activities, production activities, and sales activities were divided into normal/abnormal activities, and abnormal elements of each variable were estimated by subtracting the actual values of management activities from estimated values of normal activities. Therefore, in our study, the estimates of REM consisted of three individual REM estimates and three integrated REM estimates.

First, the level of REM calculated using abnormal CFO was estimated as follows:

$$\left(\frac{CFO_{i,t}}{Asset_{i,t-1}}\right)=\beta_1\left(\frac{1}{Asset_{i,t-1}}\right)+\beta_2\left(\frac{Sales_{i,t}}{Asset_{i,t-1}}\right)+\beta_3\left(\frac{\triangle Sales_{i,t}}{Asset_{i,t-1}}\right)+\varepsilon_{i,t}$$

$$abCFO_{i,t}=\left(\frac{CFO_{i,t}}{Asset_{i,t-1}}\right)-\left[\widehat{\beta_1}\left(\frac{1}{Asset_{i,t-1}}\right)+\widehat{\beta_2}\left(\frac{Sales_{i,t}}{Asset_{i,t-1}}\right)+\widehat{\beta_3}\left(\frac{\triangle Sales_{i,t}}{Asset_{i,t-1}}\right)\right]$$

Second, the level of REM calculated using abnormal production costs was estimated as follows:

$$\left(\frac{\mathrm{Pro}d_{i,t}}{Asset_{i,t-1}}\right)=\beta_1\left(\frac{1}{Asset_{i,t-1}}\right)+\beta_2\left(\frac{Sales_{i,t}}{Asset_{i,t-1}}\right)+\beta_3\left(\frac{\triangle Sales_{i,t}}{Asset_{i,t-1}}\right)+\beta_4\left(\frac{\triangle Sales_{i,t-1}}{Asset_{i,t-1}}\right)+\varepsilon_{i,t}$$

$$abProd_{i,t}=\left(\frac{\mathrm{Pro}d_{i,t}}{Asset_{i,t-1}}\right)-\left[\widehat{\beta_1}\left(\frac{1}{Asset_{i,t-1}}\right)+\widehat{\beta_2}\left(\frac{Sales_{i,t}}{Asset_{i,t-1}}\right)+\widehat{\beta_3}\left(\frac{\triangle Sales_{i,t}}{Asset_{i,t-1}}\right)+\widehat{\beta_4}\left(\frac{\triangle Sales_{i,t-1}}{Asset_{i,t-1}}\right)\right]$$

Third, the level of REM calculated using abnormal SG&A was estimated as follows:

$$\left(\frac{SG\&A_{i,t}}{Asset_{i,t-1}}\right)=\beta_1\left(\frac{1}{Asset_{i,t-1}}\right)+\beta_2\left(\frac{Sales_{i,t-1}}{Asset_{i,t-1}}\right)+\varepsilon_{i,t}$$

$$abSG\&A_{i,t}=\left(\frac{SG\&A_{i,t}}{Asset_{i,t-1}}\right)-\left[\widehat{\beta_1}\left(\frac{1}{Asset_{i,t-1}}\right)+\widehat{\beta_2}\left(\frac{Sales_{i,t-1}}{Asset_{i,t-1}}\right)\right]$$

In our study, for the readability of the analysis results, abnormal CFO (abCFO) and abnormal SG&A (abSG&A) were multiplied by a negative value to match the direction of REM with the direction of REM estimation. In addition, in order to reflect the comprehensive effect of the level of REM, the aforementioned three individual REM estimates were partially integrated as shown in the following three integrated REM estimates for the analysis (Lee et al., 2012).

REM1=(-)abCFO, REM2=abProd, REM3=(-)abSG&A,
REM4=abProd+(-)abSG&A, REM5=(-)abCFO+(-)abSG&A,
REM6=(-)abCFO+abProd+(-)abSG&A

3.1.2.2. Independent Variable: CSM

The level of CSM, the independent variable and major variable of our study, was estimated as follows. First, in the case of issuance of a sustainability report (SR_D), it was considered to be a dummy variable, where it is 1 when a firm is found, by using the information of the Business Institute for Sustainable Development, to issue a sustainability report, and 0 when it is not. Second, the social responsibility management and environmental management among ESG (Environmental, Social, and Governance) index of the Korea Corporate Governance Service (KCGS) were each considered as a measure of CSM. To be more specific, when the social responsibility management and environmental management are A+, it is scored 4, A for 3, B+ for 2, and B for 1.

3.1.2.3. Control Variables

In our study, the following variables that could affect the level of EM in firms were included as control variable for the research model. First, SIZE of a firm was measured as the natural logarithm of its total assets (Ji, 2013). Second, LEV was measured by dividing the total debt by the total assets. Third, CFO was measured by dividing the operating cash flow by the total assets (Kim & Ji, 2018). Fourth, ROA was measured by dividing the operating profit by the total assets. Fifth, GRW was measured with an increase in the total assets from the previous quarter. Sixth, OWN was measured as the sum of shareholding ratio of major shareholders and related parties. Seventh, BIG4 was considered as a dummy variable which having 1 if audit has been made by one of 4 major audit firms, Samil, Samjung, Anjin, and Hanyeong, and 0 if not (Ryu & Ji, 2018a). LOSS was a dummy variable having 1 if there was loss in the previous quarter and 0 if not. To control variances, attributable to each industry and year, IND (industry dummy) and YEAR (year dummy) were included.

4. Results of Empirical Analysis

4.1. Descriptive Statistics

Table 2 shows results of the descriptive statistics analysis. The average value for its dependent variable are as follows: -.002 for DA; -.039 for abnormal CFO, REM1; -.024 for abnormal production cost, REM2; -.007 for abnormal SG&A, REM3; -.031 for the integrated REM(1), [REM4=abnormal Production Cost+ abnormal SG&A*(-1)]; -.046 for the integrated REM(2), [REM5=abnormal CFO*(-1)+ abnormal SG&A*(-1)]; and -.070 for the integrated REM(3), [REM6=abnormal CFO*(-1)+ abnormal production cost + abnormal SG&A*(-1)]. Since the companies issuing sustainability reports (SR_D), an independent variable, was about 6.8%, showing that the ratio of companies issuing

sustainability reports (SR_D) was still small. On the other hand, considering the STDs of variables of the research model, the difference between median and mean was not significant, so it would be possible to assume the normal distribution of samples and the study continued (Ryu & Ji, 2018b).

4.2. Analysis of the Difference in Means

Table 2: Descriptive Statics

	Mean	Median	Std. Deviation	Percentiles	
				25	75
DA	-0.002	-0.001	0.056	-0.030	0.028
REM_1	-0.039	-0.042	0.076	-0.084	0.005
REM_2	-0.024	-0.028	0.122	-0.089	0.037
REM_3	-0.007	-0.010	0.100	-0.052	0.036
REM_4	-0.031	-0.037	0.204	-0.128	0.063
REM_5	-0.046	-0.048	0.133	-0.117	0.032
REM_6	-0.070	-0.083	0.234	-0.193	0.053
SR_D	0.068	0.000	0.252	0.000	0.000
ESG_S	1.288	1.000	0.641	1.000	1.000
ESG_E	1.384	1.000	0.617	1.000	2.000
SIZE	27.014	26.763	1.494	25.994	27.773
LEV	0.465	0.477	0.203	0.308	0.614
CFO	0.054	0.052	0.062	0.016	0.091
ROA	0.041	0.038	0.053	0.014	0.066
GRW	0.028	0.025	0.110	-0.023	0.075
OWN	0.447	0.445	0.165	0.325	0.555
BIG4	0.621	1.000	0.485	0.000	1.000
LOSS	0.237	0.000	0.425	0.000	0.000

Table 3 shows the results of T-test, conducted to see if there were any significant differences between companies with higher level of SCM and with lower level of SCM in the mean of AEM and of REM. First, the level of AEM in the companies issuing sustainable reports (SR_D=1) was not significantly lower than the companies not issuing sustainable reports (SR_D=0), but the level of REM was about 5~10% lower in the companies issuing sustainable reports, considered to be significant. Therefore, it would be reasonable to assume that companies issuing sustainable reports would have the lower level of REM than companies not issuing sustainable reports. Second, the level of AEM in the companies with the higher level of social responsibility management (ESG_S=3, 4) was not significantly lower than the companies with the lower level of social responsibility management (ESG_S=1, 2), but the level of REM was about 10% lower in some companies having the higher level of social responsibility management. Therefore, it would be reasonable to assume that companies having the higher level of social responsibility management would have the lower level of REM than companies having the lower level of social responsibility management. Third, the level of AEM in the companies with the higher level of environmental responsibility management (ESG_S=3,4) was not significantly lower than the companies with the lower level of environmental responsibility management (ESG_S=1,2), but the level of REM was about 5~10% lower in some companies having the higher level of environmental responsibility management. Therefore, it would be reasonable to assume that companies having the higher level of environmental responsibility management would have the lower level of REM than companies having the lower level of environmental responsibility management.

Table 3: T-test

		SR_D =1	SR_D =0	ESG_S =3, 4	ESG_S =1, 2	ESG_E =3, 4	ESG_E =1, 2
DA	Mean	-.0026	-.0014	-.0018	.0022	-.0056	-.0012
	P value	.847		.230		.257	
	F value	1.428		4.832		1.210	
REM_1	Mean	-.0435	-.0387	-.0332	-.0394	-.0222	-.0403
	P value	.560		.278		.048	
	F value	2.112		1.468		3.486	
REM_2	Mean	-.0451	-.0221	-.0471	-.0222	-.0415	-.0223
	P value	.034		.054		.103	
	F value	2.726		.498		.043	
REM_3	Mean	-.0167	-.0062	-.0259	-.0057	-.0231	-.0056
	P value	.098		.081		.083	
	F value	4.553		8.399		.026	
REM_4	Mean	-.0618	-.0283	-.0730	-.0279	-.0647	-.0280
	P value	.045		.090		.076	
	F value	3.109		4.642		.044	
REM_5	Mean	-.0602	-.0449	-.0592	-.0451	-.0454	-.0460
	P value	.086		.152		.967	
	F value	9.479		.328		1.182	
REM_6	Mean	-.1053	-.0670	-.1063	-.0673	-.0870	-.0683
	P value	.042		.113		.227	
	F value	4.882		1.126		.579	

4.3. Correlations

Table 4 shows the results of a correlation analysis among major variables prior to the verification of the hypotheses of our study and displays bivariate correlation coefficients (Yang & Noh, 2019). It is shown that there are generally negative associations among SCM, DA, and REM. First, the issuance of a sustainability report (SR_D) was shown to have a negative association with DA, but not significant. RD_D and REM were shown to have a negative association, with a correlation of 5%. Second, among ESG, social responsibility management (ESG_S) was shown to have a positive association with DA, but not significant. On the other hand, social responsibility management (ESG_S) and REM were shown to have a negative association, with a correlation of 5%. However, since the aforementioned analysis did not consider any control variables, the significance of its results is very limited (Park & Ryu, 2018).

Table 4: Pearson Correlation

	SR_D	ESG_S	ESG_E	DA	REM6	SIZE	LEV	CFO	ROA	GRW	OWN	BIG4
ESG_S	.564**											
	0.000											
ESG_E	.492**	.542**										
	0.000	0.000										
DA	-0.005	0.003	-0.007									
	0.347	0.901	0.407									
REM_6	-0.041	-0.023	-0.041	.104**								
	0.028	0.093	0.032	0.000								
SIZE	.494**	.562**	.592**	-0.023	0.019							
	0.000	0.000	0.000	0.403	0.490							
LEV	.130**	.146**	.210**	-.099**	.091**	.297**						
	0.000	0.000	0.000	0.000	0.001	0.000						
CFO	.060*	.068*	.087**	-.240**	-.213**	.114**	-.146**					
	0.026	0.012	0.001	0.000	0.000	0.000	0.000					
ROA	0.034	.086**	0.033	.108**	-.146**	.127**	-.214**	.603**				
	0.214	0.002	0.227	0.000	0.000	0.000	0.000	0.000				
GRW	-0.023	0.011	-.080**	.129**	-0.006	0.000	-.095**	.147**	.376**			
	0.398	0.698	0.003	0.000	0.824	0.997	0.000	0.000	0.000			
OWN	-.104**	-.091**	-.071**	-0.018	-0.023	-0.017	-.087**	.080**	.073**	-0.005		
	0.000	0.001	0.008	0.515	0.397	0.521	0.001	0.003	0.007	0.841		
BIG4	.187**	.283**	.267**	-0.006	0.041	.445**	0.041	.133**	.132**	-0.044	.062*	
	0.000	0.000	0.000	0.832	0.129	0.000	0.128	0.000	0.000	0.104	0.021	
LOSS	0.007	-0.033	0.046	-.066*	.099**	-.095**	.313**	-.280**	-.423**	-.246**	-.134**	-.082**
	0.809	0.219	0.087	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002

Note 1) *, ** correlation coefficients are significant at 0.05, and 0.01 (for both sides)

4.4. Evaluation of Hypotheses

4.4.1. H1. CSM and DA

Table 5 presents the results of the evaluation of H1: a negative relationship between CSM and DA. From the empirical analysis, it was shown that SCM and DA, in general, have a negative association at a significance level of 5~10%. First, the issuance of a sustainability report (SR_D) and DA were shown to have a negative association at a significance level of 5%. Second, ESG_S and DA were shown to have a negative association at a significance level of 5% while ESG_E was shown to have no significant association with DA. In general, because it was shown that the level of AEM was generally lower in companies achieving sustainable management than the others, H1 was supported.

The next shows the results of the analysis of control variables. First, SIZE was not shown to have a significant association with DA. Second, LEV was shown to have a negative association with DA at a significance level of 5%. Third, CFO was shown to have a very significance negative association with DA at a significance level of 1%. Fourth, ROA was shown to have a very significance positive association with DA at a significance level of 1%. Fifth, GRW was shown to have a positive association with DA at a significance level of 5%. OWN, BIG4, and LOSS did not show any significant associations with DA.

Table 5: Result of the Evaluation of H1. CSM and AEM

$DA_{i,t} = \alpha_1 + \alpha_2(CSM) + \text{Control Variables} + \varepsilon_{i,t}$

	AEM					
	Coef.	t	p	Coef.	t	p
Intercept	0.013	0.420	0.674	0.015	0.443	0.658
SR_D	-0.016	-2.212	0.034			
ESG_S				-0.011	-1.953	0.051
ESG_E				-0.012	-1.540	0.124
SIZE	0.000	0.291	0.771	0.000	0.128	0.899
LEV	-0.019	-2.426	0.015	-0.020	-2.492	0.013
CFO	-0.443	-15.825	0.000	-0.444	-15.800	0.000
ROA	0.364	9.959	0.000	0.363	9.934	0.000
GRW	0.032	2.351	0.019	0.032	2.366	0.018
OWN	-0.007	-0.843	0.399	-0.007	-0.854	0.393
BIG4	0.002	0.602	0.547	0.002	0.534	0.594
LOSS	-0.001	-0.333	0.739	-0.001	-0.357	0.721
IND/YEAR	Included			Included		
Adj-R^2	.199			.210		
F-value	20.962***			18.767***		

4.4.2. H2: CSM and REM: Issuance of a Sustainability Report (SR_D)

Table 6 shows the results of the evaluation of H2: an association between CSM and REM by using a measure of the issuance of a sustainability report (SR_D). First, SR_D and abnormal CFO (REM1) were shown to have a negative association at a significance level of 5%. Therefore, it would be reasonable to assume that companies issuing

Table 6: Results of the H 2. CSM and REM (1)

$REM_{1\text{-}6,i,t} = \alpha_1 + \alpha_2(SR\_D) + \text{Control Variables} + \varepsilon_{i,t}$

	REM Estimates ($REM_{1\text{-}3}$)					
	Abnormal CFO (REM_1)		Abnormal Production Cost (REM_2)		Abnormal SG&A (REM_3)	
	Coef.	t	Coef.	t	Coef.	t
Intercept	-0.214***	-5.741***	-0.030	-0.412	-0.046	-0.740
SR_D	-0.017**	-2.309**	-0.023*	-1.812*	-0.016	-1.612
SIZE	0.007***	4.801***	0.001	0.037	0.001	0.521
LEV	0.032***	3.497***	0.028	1.542	0.012	0.759
CFO	-0.800***	-24.278***	-0.025	-0.387	0.019	0.337
ROA	0.124***	2.900***	-0.367***	-4.322***	0.059	0.821
GRW	0.017	1.044	0.070**	2.203**	0.019	0.720
OWN	-0.008	-0.764	-0.008	-0.397	-0.008	-0.496
BIG4	0.012***	3.287***	0.015**	1.972**	0.005	0.830
LOSS	-0.001	-0.178	0.005	0.521	0.009	1.237
IND/YEAR	Included		Included		Included	
Adj-R^2	.407		.196		.133	
F-value	56.093***		19.578***		13.771***	
	Integrated Estimates of REM($REM_{4\text{-}6}$)					
	Abnormal production cost & abnormal SG&A (REM_4)		Abnormal CFO and abnormal SG&A (REM_5)		Abnormal CFO, abnormal production cost, and abnormal SG&A (REM_6)	
	Coef.	t	Coef.	t	Coef.	t
Intercept	-0.076	-0.597	-0.260***	-3.362***	-0.291**	-2.046**
SR_D	-0.039*	-1.760*	-0.033**	-2.156**	-0.056**	-2.012**
Control Variables	Included		Included		Included	
Adj-R^2	.126		.258		.186	
F-value	13.310***		26.128***		18.513***	

Note 1) *, **, *** correlation coefficients are significant at 0.10, 0.05, and 0.01 (for both sides)
Note 2) VIF Max : 2.046

sustainability reports would have the lower level of CFO (REM1) than the others. Second, SR_D and abnormal production cost (REM2) were shown to have a negative association at a significance level of 10%. Therefore, it would be reasonable to assume that companies issuing sustainability reports would have the lower level of abnormal production cost (REM2) than the others. Third, SR_D and abnormal SG&A (REM3) were shown to have an insignificant negative association. Fourth, SR_D, and abnormal production cost and abnormal SG&A were shown to have a negative association at a significance level of 10%. Therefore, it would be reasonable to assume that companies issuing sustainability reports would have the lower level of abnormal production cost and abnormal SG&A than the others. Fifth, SR_D, and abnormal CFO and abnormal SG&A (REM5) were shown to have a negative association at a significance level of 5%. Therefore, it would be reasonable to assume that companies issuing sustainability reports would have the lower level of abnormal CFO and abnormal SG&A than the others. Sixth, SR_D, and abnormal CFO, abnormal production cost, and abnormal SG&A (REM6) were shown to have a negative association at a significance level of 5%. Therefore, it would be reasonable to assume that companies issuing sustainability reports would have the lower level of REM than the others. From these results, it could be seen that companies issuing sustainability reports have the lower level of REM than the others. Thus, H2 is supported.**

Table 7 shows the results of the evaluation of H2: an association between CSM and REM by a using measures of social responsibility management (ESG_S) and environmental management (ESG_E) among ESG.

First, ESG_S and abnormal CFO (REM1) were shown to have a negative association at a significance level of 5% while ESG_E and REM1 showed no significance association. Therefore, it would be possible to assume that the level of EM in abnormal CFO is lower in companies with the higher level of social responsibility management. Second, ESG_S and abnormal production cost (REM2) were shown to have a negative association at a significance level of 10% while ESG_E and REM2 showed no significance association. Therefore, it would be possible to assume that the level of EM in abnormal production cost is lower in companies with the higher level of social responsibility management. Third, ESG_S and abnormal SG&A (REM3) were shown to have a negative association at a significance level of 5% while ESG_E and REM3 showed no significance association. Fourth, ESG_S, and abnormal production cost and abnormal

** Since results of control variables were varied by REM estimates, the results of analysis of control variables are not included in this report.

Table 7: Results of the H 2. CSM and REM (2)

$REM_{1\text{-}6,i,t} = \alpha_1 + \alpha_2(ESG\_S, ESG\_E) + Control\ Variables + \varepsilon_{i,t}$

	REM Estimates ($REM_{1\text{-}3}$)					
	Abnormal CFO (REM_1)		Abnormal Production Cost (REM_2)		Abnormal SG&A (REM_3)	
	Coef.	t	Coef.	t	Coef.	t
Intercept	-0.171***	-4.363***	0.007	0.085	-0.038	-0.590
ESG_S	-0.002**	-2.236**	-0.007*	-1.729*	-0.012**	-2.197**
ESG_E	-0.003	-0.756	-0.004	-1.095	-0.006	-0.943
SIZE	0.005***	3.218***	-0.001	-0.386	0.001	0.448
LEV	0.033***	3.619***	0.029	1.609	0.012	0.763
CFO	-0.804***	-24.313***	-0.030	-0.465	0.013	0.245
ROA	0.128***	2.977***	-0.361***	-4.248***	0.065	0.914
GRW	0.018	1.124	0.072**	2.259**	0.022	0.813
OWN	-0.005	-0.520	-0.006	-0.304	-0.009	-0.521
BIG4	0.013***	3.380***	0.015**	2.080**	0.006	0.989
LOSS	-0.002	-0.357	0.004	0.421	0.008	1.147
IND/YEAR	Included		Included		Included	
Adj-R^2	.404		.195		.135	
F-value	52.499***		18.954***		13.746***	
	Integrated Estimates of REM($REM_{4\text{-}6}$)					
	Abnormal production cost & abnormal SG&A (REM_4)		Abnormal CFO and abnormal SG&A (REM_5)		Abnormal CFO, abnormal production cost, and abnormal SG&A (REM_6)	
	Coef.	t	Coef.	t	Coef.	t
Intercept	-0.032	-0.238	-0.210***	-2.580***	-0.203	-1.361
ESG_S	-0.019*	-1.698*	-0.014**	-2.034**	-0.020*	-1.677*
ESG_E	-0.009	-0.750	-0.008	-1.122	-0.012	-0.874
Control Variables	Included		Included		Included	
Adj-R^2	.125		.208		.184	
F-value	12.982***		20.204***		17.967***	

Note 1) *, **, *** correlation coefficients are significant at 0.10, 0.05, and 0.01 (for both sides)
Note 2) VIF Max : 2.046

SG&A (REM4) were shown to have a negative association at a significance level of 10% while ESG_E and REM4 showed no significance association. Therefore, it would be possible to assume that the level of EM in abnormal production cost and abnormal SG&A is lower in companies with the higher level of social responsibility management. Fifth, ESG_S, and abnormal CFO and abnormal SG&A (REM5) were shown to have a negative association at a significance level of 5% while ESG_E and REM5 showed no significance association. Therefore, it would be possible to assume that the level of EM in abnormal production cost and abnormal CFO and abnormal SG&A is lower in companies with the higher level of social responsibility management. Sixth, ESG_S, and abnormal CFO, abnormal production cost, and abnormal SG&A (REM6) were shown to have a negative association at a significance level of 5% while ESG_E and REM6 showed no significance association. Therefore, it would be possible to assume that the overall level of EM is lower in companies with the higher level of social responsibility management.

From the aforementioned, it could be seen that companies with the higher level of social responsibility management generally have the lower level of REM than the others, but the level of environmental responsibility management is not associated with the level of REM in companies. Therefore, it could be assumed that the level of REM is generally lower in companies having the higher level of social responsibility management than the one with the lower level of social responsibility management. Therefore, H2 was partially supported.***

4.5. Additional Analysis

Corporate governance refers to the system by which a company is managed and controlled and it involves the institutional mechanisms and processes for balancing the interests of the stakeholders of the company (Ji, 2018). It addresses not only the ownership structure of the company, but also the stakeholders of the company regarding the equal treatment of stakeholders and the responsibility,

*** Since results of control variables were varied by REM estimates, the results of analysis of control variables are not included in this report.

disclosure, and transparency of the board. Many of previous studies on corporate governance (Park & Jung, 2005; Jun, 2007; Park, 2012; Bae, 2012; Kim, 2015; Lee, 2015; Ryu & Ji, 2017; Seo, 2017; Ji & Kim, 2019) reported that members of the board and controlling shareholders are likely to be engaged in various decision making processes of a company when it has outstanding corporate governance and consequently, the arbitrary decision of the largest shareholder can be controlled while the possibility of rational decision making is increased. In addition, there is a high possibility that the rights of shareholders and various stakeholders are protected because the internal and external auditing organization would be active. Therefore, in companies with outstanding corporate governance, external stakeholders are more likely to be protected, in turn reducing a possibility of being sued, and managers' opportunistic profit-making behaviors are more likely to be inhibited due to various monitoring and control devices. Therefore, corporate governance index (ESG-G), one of ESG indices, was selected to evaluate the influence of corporate governance (CG) on the level of EM in companies achieving sustainable management.

Table 8 shows the results of the evaluation of REM and AEM in companies achieving sustainable management based on the level of CG. First, regardless of the level of CG, issuance of a sustainability report (SR_D) and DA were shown to have a negative association, at a significance level of 5%. Second, while ESG_S and DA were shown to have a negative association, at a significance level of 5%, in companies with the higher level of GC, ESG_S and DA were shown to have a negative association, at a significance level of 10%, in companies with the lower level of GC. In addition, while ESG_E and DA were shown to have a negative association, at a significance level of 10%, in companies with the higher level of GC, ESG_S and DA were shown to have no significant association in companies with the lower level of GC. Therefore, it could be assumed that the level of AEM is varied by the level of CG in companies achieving social responsibility management or environmental responsibility management. Third, while issuance of a sustainability report (SR_D) and REM6 were shown to have a negative association, at a significance level of 5%, in companies with the higher level of GC, ESG_S and REM6 were shown to have a negative association, at a significance level of 10%, in companies with the lower level of GC. Therefore, it could be assumed that in companies issuing sustainability reports, the level of REM varies by the level of CG. Fourth, while social responsibility management (ESG_S) and REM6 were shown to have a negative association, at a significance level of 10%, in companies with the higher level of GC, ESG_S and REM6 were shown to have no significant association in companies with the lower level of GC. Therefore, it could be assumed that in companies achieving social responsibility management, the level of REM varies by the level of CG. From these results, it could be shown that in companies achieving sustainable management, the levels of REM and AEM vary by the level of CG.

Table 8: Additional Analysis : In Consideration of the Influence of Governance Control

$DA,\ REM_{6i,t} = \alpha_1 + \alpha_2(CPS) + \text{Control Variables} + \varepsilon_{i,t}$

	Accruals-based Earnings Management (DA)							
	Panel-A. Group with Outstanding Governance Control				**Panel-B. Group with Inferior Governance Control**			
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
Intercept	0.018	0.440	0.026	0.612	-0.033	-0.633	-0.032	-0.581
SR_D	-0.027**	-2.520**			-0.011**	-2.337**		
ESG_S			-0.015**	-2.380**			-0.002*	-1.660*
ESG_E			-0.022*	-1.656*			-0.004	-1.422
Control Variables	Included		Included		Included		Included	
Adj-R^2	.189		.214		.203		.202	
F-value	13.031***		12.3678***		8.449***		7.977***	
	Real Earnings Management (REM6)							
	Panel-A. Group with Outstanding Governance Control				**Panel-B. Group with Inferior Governance Control**			
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
Intercept	-0.254	-1.377	-0.127	-0.507	-0.193	-0.869	-0.108	-0.450
SR_D	-0.053**	-2.356**			-0.103*	-1.762*		
ESG_S			-0.024**	-2.088**			-0.037*	-1.660*
ESG_E			-0.017*	-1.805*			-0.025	-1.464
Control Variables	Included		Included		Included		Included	
Adj-R^2	.199		.206		.160		.189	
F-value	16.635***		15.145***		19.602***		16.363***	

Note 1) *, **, *** correlation coefficients are significant at 0.10, 0.05, and 0.01 (for both sides)

5. Conclusion

In our study, we extended the findings of the previous studies and evaluated the reliability of accounting information of firms achieving sustainable management from the perspective of AEM and of REM. The results of this evaluation are as follows. First, there was a negative relationship between CSM and DA, showing that the level of AEM was lower in firms achieving sustainable management than others. Second, there was a negative relationship between CSM and REM, showing that the level of REM was lower in firms achieving sustainable management than others. Nonetheless, in another analysis on investigating whether the aforementioned relationships would vary by the level of GC, we found that the level of GC, in general, affected the level of EM in firms achieving sustainable management. In addition, we found that the levels of AEM and REM were generally lower in firms achieving sustainable management than others. Accordingly, from the perspective of accounting information, we expected that firms achieving external ethics tend to have a higher level of internal ethics than others.

Our study could find its significance as the first study that focuses on CSM and verifies the level of EM in firms achieving sustainable management in consideration of both AEM and REM. The findings of our study could be useful for participants of the capital market. Our study suggested the underlying ground for online consumers actively purchasing eco-friendly firms' products; the findings of our study could be the foundation for distribution firms to raise the level of sustainable management.

It should be noted that the number of firms issued sustainability reports during the period of our study, from 2015 to 2017, was limited, so there could be some limitations to generalization of its findings. In addition, in our study, the qualitative perspective of sustainability reports was not considered and only the issuance of sustainability reports was used as a measure for the analysis. Therefore, in the follow-up study, it would be necessary to address these limitations and especially, a highly reliable measure of CSM should be developed.

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