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비재무적 정보와 감사수준 : 경영진단의견서(MD&A) 공시품질에 관한 연구

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Nonfinancial Information and Audit Efforts: Evidence from Management Discussion and Analysis (MD&A) Quality

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ABSTRACT

Purpose: The purpose of this study is to investigate whether the Management Discussion and Analysis (MD&A) has an impact on auditors' audit efforts. MD&A is a means of disclosure that provides information about a company from the management's perspective in financial reporting. The MD&A is a standardized format of nonfinancial information that can be useful for the stake-holders. The auditors have incentives to utilize the nonfinancial information contained in the MD&A for their decision-making. We posit that the MD&A disclosure quality is associated with the level of audit efforts.

Methods: We hand-collect the disclosure data from the Financial Supervisory Service of Korea (the Korean SEC).

Results: By employing two measures of audit efforts, we document evidence that the quality of MD&A is associated with both audit hours and audit fees.

Conclusion: It implies that the auditors perform intensive audit work for companies with high-quality disclosure of MD&A. The study contributes to the literature by providing the first approach to examine the association between the MD&A disclosure and audit efforts.

Key Words: Nonfinancial Information, MD&A, Disclosures, Audit Efforts

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1. INTRODUCTION

The purpose of this study is to investigate whether the "Management Discussion and Analysis (MD&A)," which is a means of disclosure by companies, has an impact on auditors' audit effort. MD&A is a means of disclosure that provides information about a company from the management's perspective in charge of financial reporting.

With a growing interest in the sustainability of a firm, the information users of MD&A focuses on non-financial information. The prior studies provide evidence that non-financial information positively impacts the relevance of firms' future performance (Dhaliwal et al., 2011; Griffin et al., 2013). However, non-financial information's credibility is an essential feature of disclosures by the nature of such information. Therefore, the governments of developing countries, such as the USA and Korea, initiated the regulations for such nonfinancial disclosures within the MD&A a while ago. The MD&A is a standardized format of nonfinancial information that can be quantified to measure the quality of nonfinancial information. Previous studies have demonstrated that the MD&A information is helpful for information users' decision-making (Park & Lee, 2016). Thus, the prior studies suggest that the auditors also use such information in their audit planning (Kwon & Moon, 2012).

The auditors are responsible for the credibility of financial reporting and audit failure. Thus, the auditors respond to such information by assessing audit plans (DeFond & Zhang, 2014). The prior literatures have examined the various aspects of audit efforts and the determinants of audit efforts, including audit hours and fees (Chun et al., 2019; Hurtt et al., 2013). O'Keefe et al. (1994) explores the characteristics of companies that affect the audit hours. Stein et al. (1994) provides evidence that the size and the complexity of businesses are the main determinants of audit hours. Simunic (1980) also addresses that the factors affecting audit fees include the size, number of subsidiaries, and overseas assets. Management has an incentive to alleviate information asymmetry by delivering private information to the stakeholders via disclosures. The MD&A disclosure is a channel where the information users utilize the information to maximize their utilities. The auditors also have such utility functions and try to utilize the nonfinancial information contained in the MD&A for their decision-making (Hyeon et al., 2014). Since the MD&A includes the nonfinancial information that can be utilized for the qualitative analysis of business contents, future performance, and sustainability of the business, it may resolve the issues with information asymmetry between management and other stakeholders. However, little is known about how the quality of MD&A disclosure affects the level of audit efforts.

We posit that the auditors are well aware of clients' financial condition, but the auditors may increase their efforts when there is an increased quality of disclosures in the MD&A. This study predicts that the MD&A disclosure information will have a systematic effect on the auditor's decision on audit efforts. Using a unique dataset obtained from the disclosure system of the Korean Financial Supervisory Service (the Korean SEC), we employ both audit hours and audit fees as dependent variables and estimate the OLS (Ordinary Least Square) regression (Park & Lee, 2016). We find that there is a positive association be-

tween the quality of MD&A disclosure and the audit efforts. It implies that the auditors perform intensive audit work for companies with high-quality disclosure of MD&A. These findings are robust even with three other measures of MD&A quality.

The findings in this study contribute to the literature as follows. First, prior studies examining the relationship between the quality of MD&A disclosure and the level of audit efforts are still insufficient. This study fills the gap among the previous studies by providing the empirical analysis of the relationship between the MD&A disclosure and the audit efforts. Second, this study provides a breakdown by constructing the MD&A disclosure. The MD&A disclosure is a standardized format of nonfinancial information, but it is difficult to quantify such information. Since the Financial Supervisory Service provides guidance for faithful disclosure, it provides a natural experiment to examine the effect of the regulatory change on the relationship between the MD&A disclosure and the level of audit efforts. To the best of our knowledge, this is the first study to examine the association between the MD&A quality and audit efforts. Finally, this study provides the practical implications that the auditors evaluate the information contained in the MD&A disclosure and adjust their audit efforts as necessary. This indicates that the MD&A disclosure includes critical information, especially in the aspects of the company's business complexity and sustainability.

The remainder of the paper is organized as follows. Following the introduction of Section 1, Section 2 reviews previous studies related to this study and establishes hypotheses. Section 3 develops research methods, and Section 4 presents the results of empirical analysis. Finally, Section 5 concludes this study.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 MD&A Disclosure

Management Discussion and Analysis (MD&A) is a narrative explanation of the financial statements and other information that enhances an investors' understanding of the financial condition, results of operation, risk, and uncertainty of the firms (U.S. SEC, 1989). Managers need to establish strategies to implement ethical management and pay attention to disclosure (Kang et al., 2021). With a growing interest in the sustainability of a firm, the information users of MD&A focuses on the nonfinancial information in the disclosure. Thus, prior studies provide evidence that nonfinancial information positively impacts the relevance of firms' future performance (Dhaliwal et al., 2011; Griffin et al., 2013). However, the credibility of nonfinancial information is an essential feature of dis-closures by the nature of such information (Cho et al., 2020). Thus, the nonfinancial information contained in MD&A should impact the users of information, both ex-ante and ex-post. In particular, this study focuses on the association between disclosure quality and audit efforts and provides evidence that information asymmetry plays an essential role in planning audit work ex-ante.

Barron et al. (1999) first analyzes the predicted future value of MD&A information by defining the

'degree of compliance of companies with the MD&A guidelines' as the quality of the MD&A disclosure. Barron et al. (1999) presents the evidence that the quality of MD&A disclosure has a negative relationship with the analyst's earnings forecasts errors. Thus, the forecasting power of future earnings from MD&A increases as the quality of MD&A rises. This implies that the disclosure with high quality provides useful information for investors' decision-making by reducing the information asymmetry Garcia and Torres (2021). Clarkson et al. (1999) also presents similar evidence supporting the relevance of MD&A through a survey of financial experts.

Lee and Kim (2014) examines the relationship between the quality of MD&A and the cost of debt. They find that the alleviated tension in information asymmetry would reduce the cost of capital. Their findings highlight the efficacy of the MD&A disclosures by providing empirical evidence that a faithful MD&A disclosure may reduce the cost of capital. In addition, Kim and Lee (2017) investigated if there is a relationship between the quality of MD&A disclosures and financial analysts' characteristics. The study finds that the companies with high-quality MD&A disclosures are associated with a higher number of analyst coverages and that the high quality of MD&A lowers the analysts' forecast errors. These results suggest that the MD&A delivers useful information for financial analysts who play an important role in the capital market. Their findings also support the notion that nonfinancial information can help to improve the information environment and eventually reduce the required rate of return by investors or creditors.

2.2 Determinants of Audit Efforts

The auditor determines the level of audit efforts by considering various company factors, including the inherent risk and complexity of a company (Kwon & Moon, 2012). The auditors are responsible for the credibility of financial information and audit failure. Whether auditors faithfully perform their duties has become a major concern of information users (Seong et al., 2022). Thus, the auditors respond to such information by assessing the audit plans(DeFond & Zhang, 2014). On the one hand, if the firms provide the MD&A disclosures with low quality, the auditor perceives it as a threat to audit failure. In this regard, the auditor may try to enhance the efficacy of the audit process by dedicating more efforts to the audit process (Sabri et al., 2015). On the other hand, if the auditors believe that there is a low level of information asymmetry between auditors and clients, they may reduce their efforts during the audit process. A tool or general definition to accurately measure the audit level has not been established academically (Choi and Park, 2018). The prior literature has examined the various aspects of the audit efforts and the determinants of audit efforts, including audit hours and fees (Chun et al., 2019).

O'Keefe et al. (1994) examine the characteristics of companies that affect the time spent on the audit. It shows that the audit hours are associated with the size of the company, the complexity of operations, and the audit risk. Stein et al. (1994) also provides evidence that the company's size and the complexity of operations are the main determinants of audit hours. Simunic (1980) also addresses that the factors affecting audit fees include the size, number of subsidiaries, and overseas as-sets. Choi (1999) confirms that the company's size among the characteristics of the clients is the most critical determinant in audit hours

with the Korean data. Ji and Moon (2006) find that the higher the risk of litigation due to corporate failure, the more time the auditor spends on auditing. There is a belief that long audit hours were spent to minimize reputational damage due to the occurrence of a lawsuit. These studies suggest that the auditor increases the audit efforts by judging the clients' information asymmetry as the risk of audit failure.

The prior studies also present the effect of clients' governance on the audit efforts. Carcello et al. (2002) and Abbott et al. (2003) report that the better the governance structure, the higher the audit fees and audit hours paid to auditors. One can see this as appointing quality auditors for signaling effect (Shawn et al., 2016). Bedard et al. (2004) and Wu (2012) report a negative (-) relationship in which audit fees increase by increasing audit efforts as there is a high probability of audit risk. Lee and Ryu (2011) found that companies with excellent governance in the board of directors pay high audit fees. The authors interpret that the management appoints a high-quality auditor, or the auditor expands the audit scope be-cause of the high level of monitoring mechanism with clients. Since the auditor plays a critical role in verifying the financial statements' reliability, the prior studies suggest auditors utilize nonfinancial information such as MD&A disclosure in performing audit work. Therefore, our study examines the relationship between the quality of MD&A and the audit efforts.

2.3 Hypothesis Development

The auditor is responsible for verifying the reliability of the company's financial statements. With the risk of audit failure, the auditor determines the level of audit efforts by assessing the company's complexity and inherent risks. The auditor evaluates the various factors, including the financial susceptibility, the probability of bankruptcy, and/or external investors' dependence on financial statements for their audit planning. The MD&A disclosure is a means of disclosure introduced for those who have difficulty understanding the condensed financial information in the annual report. The company pro-vides useful information to annual report's condensed financial information the analysis of the company's financial condition, business performance, and nonfinancial information via the MD&A disclosure. In this regard, MD&A is a critical medium to represent firms' information environment and governance mechanism. Thus, the auditors evaluate such disclosures to plan their audit works.

The MD&A disclosure elevates the auditors' ability to understand the risk of audit failure by providing additional nonfinancial information that is not fully reflected in the financial statements. The MD&A disclosure is actively used to explain the company's complex transactions, and it discloses internal information of the company that goes be-yond the financial statements. Thus, the level of audit effort will be influenced by both the quantity and quality of the MD&A disclosure, and the prior studies support that the MD&A disclosure is positively associated with the audit efforts (Kwon & Moon, 2012). By contrast, the other studies present evidence that the MD&A disclosure is negatively associated with the audit efforts. Taken together, the inconsistency of prior studies provides an empirical question of the association between the MD&A disclosure and the audit efforts. We, thus, develop the null hypothesis as follows:

Hypothesis: The MD&A disclosure is not associated with the audit efforts.

3. RESEARCH DESIGN

3.1 Sample and MD&A disclosure quality

We collect the firms listed in the stock market of Korea from 2010 to 2014. The MD&A disclosures are manually collected from the annual reports published in the Financial Supervisory Service's disclosure system. The required financial data were extracted from the publicly available resources. For the comparability of the data, we restrict our sample with the following criteria:

The company not in the financial industry;

December year-ending company;

Companies with financial data available;

Companies with MD&A disclosures available

The final sample that meets all of these criteria is 2,145 firm-years.

We obtain the information about MD&A disclosure from the sections of "The management discussion and analysis" and "Other useful information to protect investors" in the firms' annual reports. In the previous study by Barron et al. (1999), the quality of the MD&A disclosure was measured as the degree of compliance by companies with the MD&A guidelines in the U.S. In this study, a checklist was constructed to measure the quality of MD&A dis-closure based on the guidelines suggested by the Financial Supervisory Service of Korea. Then, the MD&A disclosure quality was quantified in the way described in Table 1.

Table 1 shows the variables and measurement methods of MD&A disclosure quality. The number of checklists for detailed disclosure items is 153 in total, and the points are scored for each item in the following manner. The basic scoring point is one for each checklist and zero otherwise. In addition, since the main purpose of MD&A is to provide analytical information on the past and future of a company from the managers' perspective, the level of importance weights these items. For example, the point for the disclosure of analytical information on the company's past and future is multiplied by three because it provides such important information about the company (Lee et al., 2013). On the other hand, additional adjustments are made to alleviate the disadvantages for scoring points for companies that could not disclose if there is no disclosure content for the item. For example, if the company had not changed its governance structure, the company would have nothing to disclose in the item of corporate governance. For this item, if the company discloses "not applicable," it is given 1/2 point, and if not mentioned at all, it is assigned with zero points (Park & Lee, 2016).

TSCORE is the MD&A disclosure quality obtained by summing up the scores of a total of 153 MD&A items and converting it into a point between zero and one for the test. The individual score is calculated as the raw score divided by the possible maximum score of 186. For example, if a company is assigned a raw score of 126, the TSCORE for this company is calculated as 126 divided by 186 (about 0.6774). TSCORE_NON and TSCORE_NEW are adjusted with different weights for the sensitivity analysis. WORD is

measured with the natural logarithm of all word counting in the MD&A disclosure to control for the disclosure level.

Table 1. Proxy of MD&A disclosure quality

Proxy	measurement method
(1) TSCORE	- summing up the scores of a total of 153 MD&A detailed disclosure items - items are weighted when the company provide analytical information on the past and future
(2) TSCORE_NON	- summing up the scores of a total of 153 MD&A detailed disclosure items the same score is given to all detailed items (no weight)
(3) TSCORE_NEW	- summing up the scores of a total of 153 MD&A detailed disclosure items - items are weighted when the company provide analytical information on the past and future - One point is also given to companies that have made a disclosure of "Not applicable."
(4) WORD	- Natural logarithm of all word counts published in MD&A

3.2 Research Methods

The purpose of this study is to examine whether the auditor considers nonfinancial information, MD&A, when determining the audit efforts. To examine this, we regress the audit efforts, including audit hours and fees on the MD&A disclosure quality and other control variables. The control variables include SIZE, LEV, ROA, LOSS, CRD, Unfaith, BIG4 in the following regression equation:

$$AUD = \beta_0 + \beta_1 MDA + \beta_2 SIZE + \beta_3 LEV + \beta_4 ROA + \beta_5 LOSS + \beta_6 CRD + \beta_7 Unfaith + \beta_8 BIG4 + \varepsilon \qquad \text{Equation (1)}$$

where all the variables are defined as follows:

AUD: Audit effort;

AUD_H: audit hours (natural log of audit hours);

AUD_F: audit fees (natural log of audit fees);

MDA: MD&A Disclosure measures

1) TSCORE 2) TSCORE_NON 3) TSCORE_NEW 4)WORD;

SIZE: firm size, measured as natural log of total assets;

LEV: leverage, measured as total liability divided by total assets;

ROA: return on assets, measured as net income divided by total assets;

LOSS: a dummy variable equal to 1 if the firm has incurred net loss, 0 otherwise;

CRD: credit score by NICE Investors Service, integer scale from 1 to 10;

Unfaith: a dummy variable equal to 1 if the firm is pointed out by unfaithful disclosure, 0 otherwise;

BIG4: a dummy variable equal to 1 if the firm's auditor is one of the big 4 firms, 0 other-wise.

The explanatory variable to verify the relationship between the audit efforts and the MD&A disclosure is MDA. If the estimated coefficient on MDA (β_1) is statistically significant, it means that the auditor's audit efforts are associated with the quality of the MD&A disclosure. If β_1 has a significantly positive (+) value, the auditors' audit efforts increase as the MD&A disclosure quality increases. We interpret this as the MD&A disclosure indicating the company's complexity and risks by disclosing nonfinancial information. Consequently, the auditors adjust their audit efforts to be high. In contrast, if β_1 has a significant negative (-) value, it means that the auditors decrease their audit efforts as the MD&A disclosure is of high quality.

We also include other variables that are reported to affect the audit efforts in the literature. Hence, the size of the company (SIZE), debt ratio (LEV), return on asset (ROA), loss of the period (LOSS), the credit rating (CRD), whether to disclose unfaithfully (Unfaith), whether to belong BIG4 Audit Firm (BIG4) were included in the regression model. First, the size of the firm was reported as the most crucial determinant of audit hour and audit fee in previous studies (Palmrose, 1989). If the size of the clients is large, the amount and/or complexity of business activities increases, resulting in an increase in the level of audit efforts. The debt ratio is included as a variable representing inherent risk related to financial soundness. A higher debt-to-equity ratio indicates financial difficulties for the company, and audit risk is expected to be high. Thus, the auditors are expected to spend more time in the audit. The ROA is an indicator of profitability and is calculated as net income di-vided by total assets. LOSS is a dummy variable with a value of one if there is a loss for the current period and zero otherwise to control the effect of the company's profitability. Similar to the debt ratio, CRD is also included for controlling the credit risks. In addition, it is expected that the audit fees and audit hours increase as companies are identified for un-faithful disclosure. Therefore, a dummy variable (Unfaith) with a value of one if it is with unfaithful disclosure, zero otherwise. BIG4 is included because it is assumed that the Big4 audit firms provide a high quality of audit. Thus, the audit firms with Big4 affiliation may dedicate more effort to the audit process due to the possible loss of reputation (Kwon et al., 2005).

4. RESULTS

4.1 Descriptive Statistics and Correlations

Table 2. shows the descriptive statistics for the major variables used in the analysis. The means (median) of TSCORE, TSCORE_NEW, TSCORE_NON representing the quality of MD&A disclosure are 0.141 (0.140), 0.145 (0.143), and 0.162 (0.160), respectively. Consistent with the previous studies, the mean (median) value of the quality scores is very low and right-skewed in their distribution (Park & Lee, 2016). The average value of the word count in MD&A disclosure is 6.781, confirming that the quantitative level of the MD&A disclosure in Korea is relatively low, compared to the prior studies in other countries (Kim et al., 2019). The table reports the mean (median) of audit hours of 7.221 (6.781) and the mean (median) of audit fees of 11.571 (11.407). For control variables, the sample companies' average company

size is 25.622, and the averages of debt ratio and ROA are 1.458 and 0.023, respectively. The average of LOSS indicating whether there is a loss for the current period is 0.215, and the mean of BIG4 is 0.578. The descriptive statistics in this study are consistent with those in prior studies (Park & Lee, 2016).

Table 2. Descriptive Statistics

Variables	N	Mean	Std. Dev.	Min	Median	Max
TSCORE	2,145	0.1410	0.0564	0	0.1398	0.4785
TSCORE_NEW	2,145	0.1454	0.0602	0	0.1427	0.4887
TSCORE_NON	2,145	0.1620	0.0647	0	0.1606	0.5415
WORD	2,145	6.7806	0.7114	1.6094	6.7811	9.8799
AUD_H	2,145	7.2220	0.8826	2.8904	7.0901	10.6853
AUD_F	2,145	11.5715	0.8446	8.0064	11.4076	14.9469
SIZE	2,145	25.6223	3.2055	15.777	26.3194	32.6778
LEV	2,145	1.4584	4.9238	-62.2627	0.9114	132.0681
ROA	2,145	0.0234	0.1297	-1.9005	0.0294	3.3636
LOSS	2,145	0.2154	0.4112	0	0	1
CRD	2,145	5.1002	1.9095	1	5	10
Unfaith	2,145	0.0289	0.1676	0	0	1
BIG4	2,145	0.5781	0.4940	0	1	1

Variable Definitions :
MDA = MD&A Disclosure measure
1) TSCORE 2) TSCORE_NEW 3) TSCORE_NON 4) WORD;
SIZE = firm size, measured as the natural log of total assets ;
LEV = leverage, measured as total liability divided by total assets ;
ROA = return on assets, measured as net income divided by total assets ;
LOSS = a dummy variable equal to 1 if the firm has incurred a net loss, 0 otherwise;
CRD = credit score;
Unfaith = a dummy variable equal to 1 if the firm is pointed out by unfaithful disclosure, 0 otherwise;
BIG4 = a dummy variable equal to 1 if the firm's auditor is one of the big 4 firms, 0 otherwise;

Table 3. presents the correlation between variables. It shows the correlation between audit efforts (AUD_H and AUD_F) and all MDA sub-measures (TSCORE, TSCORE_NON, TSCORE_NEW, WORD) is positive and statistically significant. The correlation analysis result shows that there is an association between the audit efforts and the MD&A disclosure. It implies that the auditors increase their audit efforts when the MD&A disclosure is of high quality. The correlations among other variables are qualitatively similar to those in other studies. For example, SIZE, ROA, and BIG4 are positively correlated with the MDA variables. Yet, as discussed above, since it is difficult to validate this study's hypothesis with the simple correlations, the multivariate analysis, including the control variables, is performed for the robust results.

Table 3. Pearson Correlation Matrix(N=2,145)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. TSCORE	1.000												
2. TSCORE_NEW	**0.983**	1.000											
3. TSCORE_NON	**0.986**	**0.969**	1.000										
4. WORD	**0.706**	**0.683**	**0.712**	1.000									
5. AUD_H	**0.375**	**0.381**	**0.371**	**0.388**	1.000								
6. AUD_F	**0.381**	**0.382**	**0.373**	**0.393**	**0.871**	1.000							
7. SIZE	**0.122**	**0.108**	**0.119**	**0.201**	**0.345**	**0.374**	1.000						
8. LEV	0.023	0.023	0.024	0.036	**0.063**	**0.073**	0.011	1.000					
9. ROA	**0.056**	**0.060**	**0.060**	0.025	0.112	**0.078**	**0.091**	**-0.148**	1.000				
10. LOSS	-0.004	-0.007	-0.009	0.019	**-0.054**	**-0.055**	**-0.090**	**0.162**	**-0.456**	1.000			
11. CRD	0.018	0.012	0.009	0.030	0.006	0.036	0.020	**0.245**	**-0.377**	**0.557**	1.000		
12. Unfaith	-0.041	**-0.048**	**-0.045**	-0.019	**-0.066**	-0.017	-0.026	0.034	**-0.095**	**0.072**	**0.100**	1.000	
13. BIG4	**0.071**	**0.065**	**0.071**	0.080	**0.286**	**0.265**	0.041	0.022	**0.130**	**-0.133**	**-079**	-0.038	1.000

Variables are defined in Table 2. Bold font indicates a significance level at 5%.

4.2 MD&A Quality and Audit Efforts

We hypothesize that the quality of MD&A is not associated with the level of audit efforts. To test this, we run the regression equation described in Section 3. Since we measure the level of audit efforts with audit hours and audit fees, Table 4. presents the results of audit hours as the dependent variable, and Table 5. shows the results of audit fees as the dependent variable. In addition, we have four different measures for MDA with TSCORE, TSCORE_NON, TSCORE_NEW, and WORD. Each column (A~D) in the tables represents the results of regression estimation for the individual measure of MDA.

Table 4. presents the results of regression with the dependent variable of audit hours. The coefficients represent the association between the quality of MD&A and the level of audit hours. The coefficient on TSCORE from Column A is 2.954 and statistically significant with the t-stat of 10.34. This means that the auditors increase the audit hours when the quality of MD&A disclosure is high. Other columns (B, C, and D) show similar coefficients on MDA measures, indicating that the association between audit hours and the quality of MD&A disclosure is positive and statistically significant. The results suggest that the auditors exert more effort during the audit process when the clients disclose the high quality of MD&A disclosure. It implies that the auditor spends more time performing the audit work to identify the risk factors of the clients. Furthermore, it provides evidence that the high quality of MD&A disclosure indicates the complexity of the business environment. For the control variables, there are positive coefficients on SIZE, CRD, and BIG4 and statistically significant, consistent with the prior studies. However, Unfaith has a negative (-) relationship with the audit hours.

Table 4.The association between Audit hour and MD&A disclosure

	[Column A] TSCORE		[Column B] TSCORE_NON		[Column C] TSCORE_NEW		[Column D] WORD	
Variables	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
MDA	2.954***	10.34	2.599***	10.31	2.807***	10.45	0.287***	10.54
SIZE	0.155***	28.39	0.156***	28.48	0.155***	28.39	0.152***	27.42
LEV	0.003	1.02	0.002	0.97	0.003	1.01	0.002	0.92
ROA	0.286**	2.29	0.285**	2.28	0.281**	2.25	0.320**	2.57
LOSS	0.019	0.44	0.018	0.42	0.020	0.47	0.012	0.29
CRD	0.022**	2.4	0.023**	2.49	0.022**	2.41	0.023**	2.57
Unfaith	-0.144*	-1.7	-0.141*	-1.66	-0.139	-1.63	-0.163*	-1.91
BIG4	0.807***	24.62	0.808***	24.66	0.806***	24.57	0.808***	24.63
YD	included		included		included		included	
Adj-R^2	0.4527		0.4525		0.4532		0.4532	
F-value	160.85***		160.76***		161.20***		160.69***	
N	2145		2145		2145		2145	

The variables are defined in Table 2. *. **, *** indicates that the estimated coefficient is statistically significant at the 10%, 5%, 1% level, respectively, based on a two-tailed test. We report the t-value based on the White heteroscedasticity-corrected standard error [30].

Table 5. presents the results of regression with the dependent variable of audit fees. Consistent with the results of Table 4., Table 5. also shows a significantly positive (+) relationship between the audit efforts and the MD&A disclosure quality. The coefficient on TSCORE is 3.205 and statistically significant at the conventional level. Other coefficients on MDAs are qualitatively consistent with that of Column A. It is generally assumed that the audit fee increases with the auditor's intensified work. In this regard, we interpret the results as the audit fees representing a reward for the audit efforts. In sum, the results of this study support that auditors are making more efforts in the audit work when firms actively engage in the disclosure of MD&A. It implies that the auditors consider the MD&A in high quality as a signal of the complex management condition. Additionally, other coefficients on control variables are quite similar to those in Table 4. In conclusion, we con-firm that the results from both Table 4.and Table 5. reject our hypothesis and indicate the positive association between the MD&A disclosure and the audit efforts.

Table 5. The association between Audit Fee and MD&A disclosure

	[Column A] TSCORE		[Column B] TSCORE_NON		[Column C] TSCORE_NEW		[Column D] WORD	
Variables	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
MDA	3.205***	11.56	2.757***	11.25	3.019***	11.56	0.311***	11.77
SIZE	0.150***	28.23	0.151***	28.36	0.150***	28.25	0.147***	27.26
LEV	0.003	1.31	0.003	1.25	0.003	1.31	0.003	1.22
ROA	0.045	0.37	0.044	0.37	0.039	0.33	0.080	0.67
LOSS	-0.053	-1.25	-0.054	-1.26	-0.051	-1.21	-0.059	-1.38
CRD	0.033***	3.75	0.034***	3.86	0.033***	3.77	0.035***	3.92
Unfaith	0.079	0.96	0.082	0.99	0.085	1.04	0.051	0.62
BIG4	0.710***	22.33	0.713***	22.39	0.709***	22.28	0.714***	22.43
YD	included		included		included		included	
Adj-R^2	0.4338		0.4320		0.4338		0.4353	
F-value	150.06***		148.99***		150.08***		150.49***	
N	2145		2145		2145		2145	

The variables are defined in Table 2. *. **, *** indicates that the estimated coefficient is statistically significant at the 10%, 5%, 1% level, respectively, based on a two-tailed test. We report the t-value based on the White heteroscedasticity-corrected standard error [30].

5. CONCLUSION

In this study, we examine the effects of MD&A disclosure on the level of audit efforts. The MD&A disclosure is a means of disclosure that provides information of the company from the management's perspective to supplement the traditional numbers in financial statements. As the nonfinancial information plays a critical role in the MD&A disclosure, such disclosures may lead the auditors to utilize the information in audit planning. We predict that the MD&A disclosure is positively associated with the level of audit efforts and find such evidence. Using the data of both audit hours and fees, we provide evidence that the quality of MD&A disclosure is positively associated with the level of audit efforts.

We collect the firms listed in the stock market of Korea from 2010 to 2014. The MD&A disclosures are manually collected from the annual reports published in the Financial Supervisory Service's disclosure system. We obtain the information about MD&A disclosure from the sections of “The management discussion and analysis” and “Other useful information to protect investors” in the annual reports of the firms.

In the previous study by [13], the quality of the MD&A disclosure was measured as the degree of compliance by companies with the MD&A guidelines in the U.S.. Using the final sample of 2,145, we find that the quality of MD&A disclosure is positively associated with the audit hours and audit fees. The MD&A disclosure provides rich information about nonfinancial information, including potential risk factors for the company. Therefore, the auditors evaluate the complexity of management with such disclosures and thus adjust their audit efforts as needed. We interpret this as auditors performing intensive work when the quality of MD&A is high.

The study makes several contributions to the literature. First, prior studies examining the relationship between MD&A disclosure and audit efforts are unclear. Nevertheless, this study contributes to the empirical analysis of whether the quality of the MD&A dis-closure affects the auditor's audit efforts. Second, this study provides an analysis by constructing the quality of MD&A disclosure. The MD&A disclosure is a standardized format of nonfinancial information, but it is difficult to quantify such measurements. Since the Financial Supervisory Service provides guidance for faithful disclosure, we measure the quality of MD&A disclosure with such unique data. This is the first study to examine the association between the MD&A quality and audit efforts using this measure of the disclosure to the best of our knowledge. Lastly, this study provides the practical implications suggesting that the auditors evaluate the information contained in the MD&A disclosure and modify their audit efforts as necessary. This implies that the MD&A disclosure pro-vides critical information, especially in the aspects of the company's business complexity and sustainability. Future studies may explore the questions on other factors affecting the auditors' efforts.

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