The Effect of Board Characteristics on the Relationship between Managerial Overconfidence and Audit Report Lag: Evidence from Korea

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Abstract

This study aimed to empirically analyze the effect of board characteristics on the relationship between managerial overconfidence and audit report lag. Managerial overconfidence was measured according to the method proposed by Schrand and Zechman (2012). The study sample comprised 4,179 firm-year observations listed on the Korea Composite Stock Price Index from 2011 to 2017. The results of the analysis were as follows. First, there was a significant positive correlation between managerial overconfidence and audit report lag. Second, the larger the board size, the more it mitigated the relationship between managerial overconfidence and audit report lag. Third, as the ratio of outside directors on the board increased, the positive relationship between managerial overconfidence and audit report lag decreased. This study is meaningful because it directly examined how the complex relationship between the characteristics of managers and the characteristics of the board of directors affects audit report lag. Managerial overconfidence increased the firm's audit risk and acted as a determinant of audit performance, and, by suggesting that it results in an increase in audit effort, the results of this study have implications for supervisory agencies, auditors, and audit target companies. In addition, the study is meaningful because it suggests that the characteristics of the board of directors can reduce audit risk by functioning as an excellent corporate governance structure.

1. Introduction

This study empirically analyzes the relationship between managerial overconfidence and audit report lag. Managerial overconfidence is a state in which managers have excessive confidence in their own abilities (Hayward & Hambrick, 1997) and the tendency to predict and be confident that the company will achieve above-average performance in future earnings (Brown & Sarma, 2007). Managers with a high tendency towards overconfidence are more likely to make arbitrary decisions through overconfidence in their management capabilities rather than collecting diverse opinions from members, and they are expected to adopt more aggressive financial reporting incentives to prove the legitimacy of their investment decisions (Ra & Park, 2016).

Research on managerial overconfidence has been conducted in the areas of investment decision-making (Malmendier & Tate, 2008), dividend policy (Deshmukh, Goel, & Howe, 2013; Hwang & Kim, 2018), and the effect on corporate financial reporting (Ahmed & Duellman, 2013; Schrand & Zechman, 2012; Yoo & Kim, 2015).

In general, it has been reported that the stronger the managerial overconfidence, the more negative the impact on the company. When a manager is overconfident in his judgment or ability to cope with a crisis, it is highly likely that he will not be able to properly collect the diverse opinions of members of the organization and, therefore, make erroneous decisions, such as underestimating the risks facing the company and overinvesting (Choi, 2012; Hayward, Rindova, & Pollock, 2004; Moon, 2012).

The audit report lag, on the other hand, refers to the period between the end of the fiscal year and the date of the audit report, and several studies have been conducted on the determinants and effects of the audit report lag. The timely provision of financial information is an important attribute of financial reporting, contributing to the investment decision-making of the capital market and information users. A delay in the audit report is interpreted as a signal to the market of possible negative issues that have arisen from the audit.

The higher the earnings transparency of audited companies, the shorter the audit report lag (Jeon & Chang, 2017). Moreover, the higher the level of managerial earnings, the more time is needed to secure the evidence necessary to form an audit opinion. As a result, the audit report lag is delayed (Nah & Choi, 2004; Roh, Lim, & Jeon, 2012).

As such, the greater the managerial overconfidence, the more negative the impact on the company. Accordingly, the audit risk increases, and the audit report may be delayed because more audit time needs to be invested to lower the detection risk. In relation to this study, it is predicted that the audit report lag will increase when the managerial tendency towards overconfidence is stronger.

Based on the discussion of the theoretical background and previous studies detailed in the following section, this study examines how managerial overconfidence affects the audit report lag. As noted, studies have been conducted on managerial overconfidence, investment decision-making, dividend policy, and financial reporting, but discussions on its connection to auditing are lacking. Therefore, this study examines the relationship between managerial overconfidence and audit report lag. The analysis period is from 2011 to 2017, and the companies targeted are those listed on the Korea Composite Stock Price Index.

Compared with previous studies related to the audit report lag, this study makes the following additional contributions. First, by examining the relationship with the audit report lag using managerial overconfidence as the key manager characteristic, it broadens the understanding of the characteristics of managers. Second, by analyzing the relationship between managerial overconfidence and audit report lag, it reveals that managerial characteristics can be a determinant of audit report lag. Third, it shows that managerial overconfidence increases the firm's control risk and acts as a determinant of the audit performance procedure. In other words, by presenting the result of an increase in audit effort, the study provides implications for supervisory agencies, auditors, and companies subject to audit. Fourth, it demonstrates that the positive relationship between managerial overconfidence and audit report lag is dependent on the characteristics of the board of directors.

The structure of this paper is as follows. Following this introduction, Section 2 presents a review of previous studies and the hypothesis development, and Section 3 explains the research design. Next, Section 4 reports the results of the empirical analysis, and Section 5 presents the conclusions and limitations.

2. Background and Hypothesis Development

2.1. Managerial Overconfidence

Managerial overconfidence refers to the managers' tendency to be overly optimistic about future cash flows, returns on planned investments, or their ability to overcome difficulties their company is currently facing (Ra & Park, 2016).

Malmendier and Tate (2005) showed that managers with high levels of overconfidence tend to underestimate the risks inherent in investment and overestimate the expected return when making investment decisions. Therefore, they argued that a negative net present value (NPV) project would be mistaken for a positive NPV project, causing overinvestment. Heaton (2002) stated that highly overconfident managers tended to use internal funds as much as possible when raising funds, judging that the future value of the firm they operated was undervalued. The higher the tendency to overconfidence, the lower the dividend level because the accumulated funds within the company are concentrated on new investments (Cordeiro, 2009). Managers invest aggressively with retained earnings and invest even while increasing the amount of debt (Ben-David, Graham, & Harvey, 2013).

Managers with overconfidence tend to intentionally make errors in financial statement preparation (Schrand & Zechman, 2012). Managers with overconfidence tend not to adopt conservatism (Ahmed & Duellman, 2013). Also, managers with a high level of overconfidence tend to voluntarily disclose managerial forecast information and raise earnings (Hribar, Kim, Wilson, & Yang, 2013).

Kim and Yoo (2014) found that firms with higher managerial overconfidence tended to have a cost stickiness that did not reduce related resources as sales decreased due to high expectations for future sales recovery. Yoo and Kim (2015) and Hwang, Cha, and Yeo (2015) confirmed the negative relationship between managerial overconfidence and conservatism.

Hwang and Cha (2015) found that the higher the managerial overconfidence, the higher the earnings management. Managers with a high tendency towards overconfidence may experience inefficient resource management due to excessive investment. Accordingly, they claimed that accruals are used as a means of adjustment when the expected performance is not achieved.

Ra and Park (2016) confirmed that the stronger the managerial overconfidence, the weaker the relationship between current income and current expenses due to the manager's intentional intervention in financial reporting. The stronger the managerial overconfidence, the earlier the manager tends to recognize

the performance of the investment plan. Accordingly, delaying the recognition of a certain portion of current expenses corresponding to current income is the result of an aggressive accounting choice.

Kim, Shin, and Kim (2018) stated that the higher the managerial overconfidence, the higher the audit fee. These results can be interpreted to mean that when the auditor judges the managerial overconfidence in the external audit as a factor that increases the audit risk and thus deteriorates the quality of the financial statements and increases the control risk, this is reflected in the audit fee.

2.2. Audit Report Lag

Delays in audit reports impair the quality of financial information by not providing timely information to key stakeholders. In general, there is an inverse relationship between information value and time to prepare financial statements. Delays in financial reports, when information is not disclosed in a timely manner, can negatively affect firm value (Blankley, Hurtt, & MacGregor, 2014; Givoly & Palmon, 1982). Investors postpone stock trading until earnings have been announced (Beaver, Lambert, & Morse, 1980). The stock price response to early earnings reports is more important than the stock price response to delayed earnings reports. This suggests that early announcement of financial performance is advantageous (Givoly & Palmon, 1982).

Previous studies relating to the determinants of audit report lag have mainly reported on the characteristics of audited companies (e.g., firm size, industry characteristics, profitability, leverage, and contents and revisions of financial statements) (Ashton, Graul, & Newton, 1989; Blankley et al., 2014; Davies & Whittred, 1980; Ettredge, Li, & Sun, 2006; Munsif, Raghunandan, & Rama, 2012). Ashton, Willingham, and Elliott (1987) stated that audit report lag is determined by business complexity, firm size, listing status, profitability, and risk factors.

Also, Carslaw and Kaplan (1991) presented debt as an important determinant of audit report lag. Another research flow relates to the characteristics of external auditors (for instance, size of auditors, structure of external auditors, provision of non-audit services, auditing techniques of auditing firms, replacement of audit partners, and change of auditors) (Bamber, Bamber, & Schoderbek, 1993; Jaggi & Tsui, 1999; Knechel & Sharma, 2012; Lee, Mande, & Son, 2009; Tanyi, Raghunandan, & Barua, 2010). In general, it has been argued that audit report lag is greater in highly structured audit firms than in audit firms with significant audit processes (Ashton et al., 1989; Henderson & Kaplan, 2000). Audit report lag is also a function of the audit approach used by auditors (Kinney & McDaniel, 1993). Recently, in the context of audit reports, determinants of corporate governance, ownership structure (Ettredge, Kwon, Smith, & Zarowin, 2005; Handoyo & Kusumaningrum, 2022; Jaggi & Tsui, 1999; Liang, Lin, Chou, & Hsiao, 2021), and internal control (Ashton et al., 1987; Ettredge et al., 2006; Munsif et al., 2012) have been studied. Nah and Choi (2004) examined the relationship between accruals and audit report lag. The size of accounting accruals was measured by the severity of accounting accruals, and accounting accrual severity was defined as the proportion of the absolute value of accounting accruals to sales. Based on their analysis, they concluded there was a positive relationship between accounting accrual severity and audit report lag. Bae and Sohn (2013) reported that the greater the difference in the equity ratio of the audited company, the larger the audit report lag. Park (2016) reported that the interaction between 4Q earnings management and executive cash remuneration was positively related to audit report lag. Chang, Lee, and In (2016) showed a positive relationship between designation as an unfaithful disclosure corporation and audit report lag. In other words, a corporation that discloses unfaithfully represents an increased audit risk, which means that the audit report lag increases accordingly. Jeon and Chang (2017) showed a negative relationship between the earnings transparency and audit report lag of audited companies; the higher the firms' earnings transparency, the shorter the audit report lag. Kim. and Shin (2017) reported a significant positive correlation between auditor size and the audit report lag. This can be a result of efforts to maintain their reputation, as the larger the auditor, the greater the loss suffered from low-quality audits. Lee and Byun (2020) found that as managerial overconfidence increased, audit report lag increased. This means that it takes more time for the auditor to have reasonable confidence in the assertions of overconfident managers when establishing the audit plan. As such, a longer audit report lag compared to other firms, meaning a lack of timeliness in financial reporting, can be interpreted as external auditors needing to exert a large amount of effort, which may indicate a relatively high-risk firm (Kim & Bae, 2016). However, when the audit report lag increases as a result of the external auditors' putting in considerable effort (time), it may act as a factor that reduces firm risk – if it leads to an improvement in audit quality (Kim & Bae, 2016). Managers with a high risk of overconfidence report that they predict high future investment returns, act less conservatively, and conduct opportunistic earnings management. Therefore, the auditor may judge that such a manager's tendency increases the financial reporting risk and recognize that it increases the possibility of distortion of the financial statements. Accordingly, auditors must invest additional audit efforts to reduce audit risk, and the audit report lag is expected to increase. Therefore, we hypothesize as follows:

H_1: *There is a positive relationship between managerial overconfidence and audit report lag.*

The larger the board size, the higher the firm value due to the professional activities of board personnel with expertise (Xie, Wallace, & Peter, 2003). Chtourou, Bedard, and Coutreau (2001) reported that the larger the board size, the more helpful in suppressing management earnings activities. The larger the board size, the better the quality of accounting information and the better the information environment, so audit risk can be

reduced. Accordingly, the audit report lag may be shortened. Therefore, we hypothesize as follows:

H₂: The effect of the size of the board of directors on the relationship between managerial overconfidence and the audit report lag is negative.

The higher the ratio of outside directors, the better advice they can give the CEO because the various outside directors have considerable experience and knowledge. That is, a board with a high ratio of outside directors can positively affect firm value (Core, Holthausen, & Larcker, 1999; Dahya, Dimitrov, & McConnell, 2008; Dalton, Daily, Johnson, & Ellstrand, 1999; Shin, Chang, & Lee, 2004). Yermack (1996) argued that the higher the ratio of outside directors, the more independent the board of directors. Also, Core et al. (1999) reported a positive correlation between the ratio of outside directors and firm value. In other words, the higher the ratio of outside directors, the lower the audit risk, so the audit report lag can be shortened. Therefore, we hypothesize as follows:

H₃: The effect of the ratio of outside directors on the relationship between managerial overconfidence and audit report lag is negative.

3. Research Design

3.1. Regression Models

The regression model used to test Hypothesis 1 on the relationship between managerial overconfidence and audit report lag in this study is shown in Equation 1. Managerial overconfidence (OC) was measured using the method proposed by Schrand and Zechman (2012). The dependent variable, the audit report lag, was measured using the natural logarithm of the number of days from the end of the fiscal year to the audit report date and the raw variable. OC is the variable of interest in Hypothesis 1, and the predicted sign of β_1 is positive.

The regression model used to test Hypothesis 2 on the effect of the board size on the relationship between managerial overconfidence and audit report lag is shown in Equation 2. OC*BOARDSIZE is the variable of interest in Hypothesis 2, and the predicted sign of β_3 is negative.

The regression model used to test Hypothesis 3 on the effect of the ratio of outside directors on the relationship between managerial overconfidence and audit report lag is shown in Equation 3. OC*OUTBOARD is the variable of interest in Hypothesis 3, and the predicted sign of β_3 is negative.

$$\text{ARL}_{it} = \beta_0 + \beta_1 \text{OC}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{LEV}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{GRW}_{it} + \beta_6 \text{LOSS}_{it} + \beta_7 \text{FORSALE}_{it}$$
$$+ \beta_8 \text{BIG4}_{it} + \beta_9 \text{OPIN}_{it} + \beta_{10} \text{AT}_{it} + \beta_{11} \text{FOR}_{it} + \beta_{12} \text{OWN}_{it} + \sum \text{YD} + \sum \text{ID} + \varepsilon_{it} \qquad (1)$$

$$\text{ARL}_{it} = \beta_0 + \beta_1 \text{OC}_{it} + \beta_2 \text{BOARDSIZE}_{it} + \beta_3 \text{OC*BOARDSIZE}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it}$$
$$+ \beta_6 \text{ROA}_{it} + \beta_7 \text{GRW}_{it} + \beta_8 \text{LOSS}_i + \beta_9 \text{FORSALE}_{it} + \beta_{10} \text{BIG4}_{it} + \beta_{11} \text{OPIN}_{it} + \beta_{12} \text{AT}_{it}$$
$$+ \beta_{13} \text{FOR}_{it} + \beta_{14} \text{OWN}_{it} + \sum \text{YD} + \sum \text{ID} + \varepsilon_{it} \qquad (2)$$

$$\text{ARL}_{it} = \beta_0 + \beta_1 \text{OC}_{it} + \beta_2 \text{OUTBOARD}_{it} + \beta_3 \text{OC*OUTBOARD}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it}$$
$$+ \beta_6 \text{ROA}_{it} + \beta_7 \text{GRW}_{it} + \beta_8 \text{LOSS}_{it} + \beta_9 \text{FORSALE}_{it} + \beta_{10} \text{BIG4}_{it} + \beta_{11} \text{OPIN}_{it} + \beta_{12} \text{AT}_{it}$$
$$+ \beta_{13} \text{FOR}_{it} + \beta_{14} \text{OWN}_{it} + \sum \text{YD} + \sum \text{ID} + \varepsilon_{it} \qquad (3)$$

Where ARL_{it} = audit report lag, the number of days from the end of the fiscal year to the date of the audit report for firm i in year t; OC_{it} = managerial overconfidence for firm i in year t; BOARDSIZE_{it} = The size of board of directors for firm i in year t; OUTBOARD_{it} = The ratio of outside directors on the board of firm i in year t; $\text{OC}_{it}*\text{BOARDSIZE}_{it}$ = interaction variables between OC and BOARDSIZE for firm i in year t; $\text{OC}_{it}*\text{OUTBOARD}_{it}$ = interaction variables between OC and OUTBOARD for firm i in year t; SIZE_{it} = firm size, the natural log of lagged total assets for firm i in year t ; LEV_{it} = leverage, total debt divided by total assets for firm i in year t; ROA_{it} = profitability, pretax income divided by total assets for firm i in year t; GRW_{it} = growth rate, one-year growth rate in sales for firm i in year t; LOSS_{it} = loss firm indicator variable, l if the firm reported negative net income, and 0 otherwise for firm i in year t; FORSALE_{it} = export ratio, overseas sales/total sales; BIG4_{it} = BIG4 affiliated audit firm indicator variable, l if the firm was audited by a Big 4 auditor, and 0 otherwise for firm i in year t; OPIN_{it} = audit opinion, 1 if an audit opinion is not unqualified, and 0 otherwise for firm i in year t; AT_{it} = audit time; FOR_{it} = the foreign ownership for firm i in year t; OWN_{it} = the largest shareholders ownership for firm i in year t; IND_{it} = industry dummy; YD_{it} = year dummy; ε_{it} = -residuals, the estimated error in the model. s control variables, SIZE, LEV, ROA, GRW, LOSS, FORSALE, BIG4, OPIN, AT, FOR, and OWN were selected. SIZE is the size of a company and is measured by taking the natural logarithm of total assets. LEV is a company's debt-to-equity ratio and represents leverage or capital structure. ROA represents profitability and GRW represents growth rate. LOSS is a loss dummy variable, which is 1 if net income is negative, and 0 otherwise. FORSALE is the proportion of exports and is defined as the ratio of exports to total sales. BIG4 is a dummy variable that is 1 if the auditor is one of the big four, and 0 otherwise. OPIN is a dummy variable that is 0 if the audit opinion is unqualified and 1 otherwise. AT is the value obtained by taking the natural logarithm of the audit time. In addition, we included FOR and OWN to control corporate governance. For year- and industry-specific control, the year dummy variable (YD) and industry dummy variable (IND) were included.

3.2. Sample Selection

The sample of this study was the companies listed on the KOSPI from 2011 to 2017. Financial data were collected from FN Data-Guide, and data on audit report lag were hand-collected from disclosure data of the Financial

Supervisory Service. To ensure sample homogeneity, financial businesses were excluded. In this study, each variable except for the dummy variable was treated as an outlier and adjusted (winsorized) for observations with values less than or equal to the lower 1% and greater than or equal to the upper 99%. The final sample used for hypothesis testing comprised 4,179 company years.

Panel A of Table 1 displays the annual distribution of the sample. The proportion of samples per year was similar. Panel B of Table 1 displays the distribution of the sample by industry. Publishing/broadcasting/video, rubber plastics, and non-metal samples were the least represented, and the professional service and coke/chemical industries were the most sampled.

Table 1. Sample distributions.

Panel A: Distribution across fiscal years		
Year	**N**	**(%)**
2011	579	13.85
2012	583	13.95
2013	588	14.07
2014	578	13.83
2015	596	14.26
2016	615	14.72
2017	640	15.31
Total	4,179	100
Panel B: Industry distribution		
Industry	**N**	**(%)**
Food, Beverage	211	5.05
Fiber, Clothes, Leathers	158	3.78
Timber, Pulp, Furniture	153	3.66
Coke, Chemical	456	10.91
Medical Manufacturing	202	4.83
Rubber & Plastic	117	2.8
Non Metallic	117	2.8
Metallic	346	8.28
Pc, Medical	256	6.13
Machine & Electronic	274	6.56
Other Transportation	325	7.78
Construction	173	4.14
Retail & Whole Sales	345	8.26
Transportation Service	127	3.04
Publishing, Broadcasting	89	2.13
Professional Services	489	11.7
Other	341	8.16
Total	4,179	100

4. Empirical Results

4.1. Descriptive Statistics

Table 2 shows the descriptive statistics of the main variables for the sample. The average audit report lag was about 68 days. The average managerial overconfidence was 0.03 and the median was -0.006. The firm size (SIZE) averaged 27.141 while the median was 26.930, and the debt to equity ratio (LEV) was 0.470 and the median was 0.476. The average of the loss dummy (LOSS) was 0.235, meaning that about 24% of the total sample reported losses.

Exports accounted for an average of 21% of total sales. About 67% of the total sample was externally audited by one of the large accounting firms (BIG4). Most of the companies had an appropriate opinion while 0.3% of the companies had an unqualified audit opinion. The average audit time was 2,455 hours. The average foreign ownership ratio (FOR) and major shareholder ratio (OWN) were 10.3% and 44.2%, respectively.

Table 2. Descriptive statistics (N=4,179).

Variables	Mean	Std. Dev.	Min	25th percentile	Median	75th percentile	Max
ARL(raw)	68.296	10.511	32.000	65.000	71.000	75.000	82.000
ARL(log)	4.207	0.194	2.833	4.174	4.263	4.317	4.595
OC	0.030	0.407	-1.430	-0.065	-0.006	0.070	1.617
SIZE	27.141	1.588	24.137	26.022	26.930	28.039	31.532
LEV	0.470	0.203	0.078	0.307	0.476	0.618	0.949
ROA	0.023	0.078	-0.305	0.002	0.027	0.059	0.242
GRW	0.064	0.198	-0.426	-0.018	0.033	0.103	1.175
LOSS	0.235	0.424	0.000	0.000	0.000	0.000	1.000
FORSALE	21.277	28.506	0.000	0.000	4.767	39.430	99.332
BIG4	0.670	0.470	0.000	0.000	1.000	1.000	1.000
OPIN	0.003	0.051	0.000	0.000	0.000	0.000	1.000
AT(raw)	2455.210	3267.470	88.000	864.000	1362.500	2575.000	22058.000
AT(log)	7.349	0.936	1.386	6.772	7.223	7.860	11.142
FOR	0.103	0.132	0.000	0.014	0.048	0.143	0.897
OWN	0.442	0.165	0.020	0.323	0.447	0.555	0.900

4.2. Correlation Analysis

Table 3 shows the results of the Pearson correlation analysis of major variables. The variables of interest in this study, managerial overconfidence (OC) and the dependent variable audit report lag (ARL), showed a significant positive correlation. This result reveals that the audit report lag increases for companies with managerial overconfidence due to increased audit risk. Firm size (SIZE), debt ratio (LEV), loss dummy (LOSS), firms audited by a large accounting firm (BIG4), audit opinion (OPIN), and audit time (AT) all showed a significant positive relationship with audit report lag (ARL). Profitability (ROA) and major shareholding ratio (OWN) showed a significant negative relationship with audit report lag (ARL). The larger the firm size, the higher the debt ratio, the more firms that reported losses, the more firms audited by a large accounting firm, the more unqualified the audit opinion, and the longer the audit time, the longer the audit report lag. On the other hand, the higher the profitability and the higher the majority shareholding ratio, the shorter the audit report lag.

Table 3. Pearson correlations (N=4,179).

Variables	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)ARL	0.046***	0.175***	0.204***	-0.093***	0.005	0.058***	-0.025	0.419***	0.041***	0.283***	0.004	-0.035**
(2)OC		0.273***	0.001	0.031**	0.026*	-0.043***	-0.026*	0.084***	-0.006	0.172***	0.132***	-0.040***
(3)SIZE			0.263***	0.161***	0.066***	-0.149***	0.004	0.453***	-0.014	0.723***	0.428***	0.030**
(4)LEV				-0.347***	-0.022	0.313***	0.063***	0.099***	0.028*	0.269***	-0.122***	-0.142***
(5)ROA					0.267***	-0.688***	-0.056***	0.107***	-0.093***	0.051***	0.245***	0.196***
(6)GRW						-0.199***	-0.037**	-0.003	-0.014	0.016	0.053***	0.035**
(7)LOSS							0.084***	-0.119***	0.049***	-0.044***	-0.171***	-0.180***
(8)FORSALE								-0.004	0.013	0.049***	-0.050***	-0.112***
(9)BIG4									-0.002	0.480***	0.232***	0.071***
(10)OPIN										0.013	-0.015	-0.012
(11)AT											0.347***	-0.107***
(12)FOR												-0.143***
(13)OWN												

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

4.3 Multivariate Results

Table 4 shows the results of the regression analysis of Equation 1 on the relationship between managerial overconfidence and audit report lag. The result of the analysis revealed that the F-value was significant at the 1% level, meaning that the research model is appropriate.

In Table 4, the regression coefficient (β_1) of OC, which shows the effect of managerial overconfidence on the audit report lag, was 0.021 and 1.211 in Model 1 and Model 2, respectively, indicating significant positive values at the 1% level. In other words, the empirical result shows that the greater the managerial overconfidence, the greater the audit report lag, which supports hypothesis 1.

Looking at the control variables, LEV, GRW, BIG4, OPIN, and AT showed a significant positive influence, meaning that the higher the debt ratio and growth rate, whether audited by a large accounting firm, the more unfavorable the opinion, and the longer the audit time, the longer the audit report lag. SIZE, ROA, FORSALE, FOR,

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and OWN showed a significant negative influence. The larger the firm size, the better the profitability, the larger the proportion of exports, and the higher the foreign and major shareholder share, the shorter the audit report lag.

Table 4. The effect of managerial overconfidence on audit report lag (H1).

Variables	Dependent Variable ARL(log)		Dependent Variable ARL(raw)	
	Coefficient	t-value	Coefficient	t-value
INTERCEPT	4.498	66.230***	87.916	24.750***
OC	0.021	3.020***	1.211	3.380***
SIZE	-0.021	-6.620***	-1.351	-8.100***
LEV	0.134	8.030***	8.407	9.660***
ROA	-0.174	-3.430***	-7.685	-2.900***
GRW	0.049	3.310***	2.654	3.440***
LOSS	0.008	0.850	0.761	1.620*
FORSALE	-0.001	-2.400**	-0.014	-2.470**
BIG4	0.200	29.370***	10.939	30.650***
OPIN	0.094	1.770*	5.195	1.870*
AT	0.022	4.410***	1.379	5.270***
FOR	-0.082	-3.090***	-5.492	-3.980***
OWN	-0.038	-2.120**	-1.957	-2.060**
Year dummy	Included		Included	
Industry dummy	Included		Included	
F-VALUE	60.05***		65.27***	
ADJ R-SQ	32.61%		34.50%	

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 5 shows the results of the regression analysis of Equation 2, which reveals the effect of the size of the board of directors on the relationship between managerial overconfidence and audit report lag.

The regression coefficient (β_3) of OC*BOARDSIZE, which shows the effect of the size of the board of directors on the relationship between managerial overconfidence and audit report lag, was -0.019 and -1.090 in Model 1 and Model 2, respectively, indicating a significant negative effect at the 10% level.

This empirical result shows that the relationship between managerial overconfidence and audit report lag is more statistically significant in firms with large boards. This suggests that the audit report lag is shortened because the size of the board of directors works as an excellent governance structure to reduce audit risk.

Table 5. The effect of board size on the relationship between managerial overconfidence and audit report lag (H2).

Variables	Dependent Variable ARL(log)		Dependent Variable ARL(raw)	
	Coefficient	t-value	Coefficient	t-value
INTERCEPT	4.504	65.600***	88.319	24.600***
OC	0.032	3.000***	1.897	3.370***
BOARDSIZE	0.004	0.760	0.305	0.990
OC*BOARDSIZE	-0.019	-1.780*	-1.090	-1.870*
SIZE	-0.022	-6.670***	-1.376	-8.170***
LEV	0.135	8.080***	8.470	9.730***
ROA	-0.172	-3.390***	-7.544	-2.840***
GRW	0.049	3.330***	2.669	3.460***
LOSS	0.008	0.880	0.781	1.660*
FORSALE	0.000	-2.490**	-0.014	-2.560**
BIG4	0.200	29.300***	10.916	30.570***
OPIN	0.093	1.760*	5.157	1.860*
AT	0.022	4.470***	1.397	5.330***
FOR	-0.083	-3.120***	-5.565	-4.020***
OWN	-0.037	-2.040**	-1.870	-1.960**
Year dummy	Included		Included	
Industry dummy	Included		Included	
F-VALUE	56.79***		61.75***	
ADJ R-SQ	32.62%		34.52%	

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

Table 6 shows the regression analysis result of Equation 3, revealing the effect of the ratio of outside directors on the relationship between managerial overconfidence and audit report lag. The regression coefficient (β_3) of OC*OUTBOARD, which shows the effect of the ratio of outside directors on the relationship between managerial

overconfidence and audit report lag, was -0.028 and -1.335 in Model 1 and Model 2, respectively, indicating a significant negative effect at the 10% level.

This empirical result indicates that the relationship between managerial overconfidence and audit report lag is more statistically significant in the group with a high proportion of outside board members. This suggests that the audit report lag is shortened because the ratio of outside directors works as an excellent governance structure to lower audit risk.

Table 6. The effect of the ratio of outside directors on the relationship between managerial overconfidence and audit report Lag (H3).

Variables	Dependent Variable ARL(log)		Dependent Variable ARL(raw)	
	Coefficient	t-value	Coefficient	t-value
INTERCEPT	4.475	65.190***	86.498	23.840***
OC	0.025	3.050***	1.361	3.180***
OUTBOARD	0.016	2.150**	0.876	2.230**
OC*OUTBOARD	−0.014	−1.750*	−0.552	−1.710*
SIZE	−0.021	−6.500***	−1.324	−7.840***
LEV	0.135	8.110***	8.480	9.640***
ROA	−0.165	−3.340***	−7.408	−2.830***
GRW	0.049	3.260***	2.680	3.380***
LOSS	0.008	0.900	0.772	1.630
FORSALE	0.000	−2.400**	−0.014	−2.480**
BIG4	0.201	29.410***	11.058	30.640***
OPIN	0.094	1.770*	5.208	1.860*
AT	0.022	4.420***	1.365	5.170***
FOR	−0.084	−3.180***	−5.621	−4.030***
OWN	−0.039	−2.140***	−2.027	−2.110**
Year dummy	Included		Included	
Industry dummy	Included		Included	
F-VALUE	56.88***		61.51***	
ADJ R-SQ	32.65%		34.43%	

Note: ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

5. Conclusion

This study has analyzed the effect of managerial overconfidence on audit report lag using a sample of 4,179 firm-year observations from 2011 to 2017. Additionally, the differential effects of the characteristics of the board of directors on managerial overconfidence and audit report lag were examined. The size of the board of directors and the ratio of outside directors were selected as board characteristics. Managerial overconfidence was measured using the methodology of Schrand and Zechman (2012). The audit report lag was measured as the natural logarithm of the number of days from the settlement date to the audit report date and the raw variable, respectively. The audit report lag is used as a proxy for the auditor's effort and the timeliness of financial reporting (Bae & Sohn, 2013). Previous studies have reported that the longer the audit report lag, the less timeliness it has, which impairs the quality of financial information. On the other hand, a long audit report lag can be interpreted as an effort by the auditor to increase the audit quality by investing more audit time. In this study, managerial overconfidence was selected as a determinant of the audit report lag. Because previous studies had shown that managerial overconfidence can increase audit risk, we empirically analyzed how managerial overconfidence affects the audit report lag. The results of this study are as follows. First, there was a significant positive relationship between managerial overconfidence and the audit report lag. This means that the stronger the managerial overconfidence, the greater the audit report lag. In other words, this result suggests that the audit report lag increases because, from the perspective of external auditors, managerial overconfidence is recognized as a factor that increases audit risk, and they thus invest more audit effort. Second, the variable for board size had a significant negative effect on the correlation between managerial overconfidence and the audit report lag. As the size of the board of directors increased, the positive effect of managerial overconfidence on the audit report lag was mitigated. Third, the variable for the ratio of outside directors had a significant negative effect on the correlation between managerial overconfidence and the audit report lag. As the ratio of outside directors increased, the positive effect of managerial overconfidence on the audit report lag was mitigated. The contributions of this study are as follows. It is meaningful in that it directly examined the effect of the characteristics of the board of directors on the relationship between managerial overconfidence and audit report lag. In short, managerial overconfidence increased the firms' audit risk and acted as a determinant of the audit performance procedure, suggesting that audit effort increased. Additionally, it was found that the characteristics of the board, measured by the size of the board of directors and the ratio of outside directors, had a differential effect on the managerial overconfidence and the audit report lag. In other words, it has provided important implications

about the way the characteristics of the board of directors affect the auditing process of companies. As a limitation of this study, it seems that it will be necessary to additionally consider the omitted variables and the proxy values of managerial overconfidence that affect the audit report lag. In addition, since the relationship between managerial overconfidence and audit report lag may be due to industry and company characteristics, we recommend a follow-up study that takes industry and company characteristics into account.

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Appendix 1. Variable definitions for H1, H2, H3.

Dependent Variables

ARL(log) $_{it}$	=	Audit report lag (log variable), the natural log of the number of days from the end of the fiscal year to the date of the audit report for firm i in year t
ARL(raw) $_{it}$	=	Audit report lag (raw variable), the number of days from the end of the fiscal year to the date of the audit report for firm i in year t

Explanatory Variables

OC $_{it}$	=	Managerial overconfidence for firm i in year t
OC $_{it}$* BOARDSIZE $_{it}$	=	Interaction variables between OC and BOARDSIZE for firm i in year t
OC $_{it}$* OUTBOARD $_{it}$	=	Interaction variables between OC and OUTBOARD for firm i in year t

Control variables

BOARDSIZE $_{it}$	The size of the board of directors for firm i in year t;
OUTBOARD $_{it}$	The ratio of outside directors on the board of firm i in year t;
BIG4 $_{it}$	Big 4 affiliated audit firm indicator variable, l if the firm was audited by a Big 4 auditor, and 0 otherwise for firm i in year t;
SIZE $_{it}$	firm size, the natural log of lagged total assets for firm i in year t;
LEV $_{it}$	leverage, total debt divided by total assets for firm i in year t;
ROA $_{it}$	profitability, pretax income divided by total assets for firm i in year t;
GRW $_{it}$	growth rate, one-year growth rate in sales for firm i in year t;
LOSS $_{it}$	loss firm indicator variable, l if the firm reported negative net income, and 0 otherwise for firm i in year t;
FORSALE $_{it}$	export ratio, overseas sales / total sales;
BIG4 $_{it}$	Big 4 affiliated audit firm indicator variable, l if the firm was audited by a Big 4 auditor, and 0 otherwise for firm i in year t;
OPIN $_{it}$	audit opinion, 1 if an audit opinion is not unqualified, and 0 otherwise for firm i in year t;
AT (log) $_{it}$	audit time (log variable), the natural log of audit time;
AT (raw) $_{it}$	audit time (raw variable) ;
FOR $_{it}$	foreign ownership for the firm in year t;
OWN $_{it}$	ownership for the firm in year t;
YD	year dummy;
ID	industry dummy.

Appendix 2. Variable definitions for the measure of managerial overconfidence.

Appendix 2 presents the method of Schrand and Zechman (2012) and variable definitions. The detailed variable measurement model according to the method of Schrand and Zechman (2012) is as follows.

asset growth rate $_t$ = a_1 + sales growth rate $_t$ + ε_t

where asset growth rate = (total assets in year t − total assets in year t-1)/(total assets in year t-1),

Sales growth rate = (sales in year t − sales in year t-1) / (sales in year t-1).