Do Auditor's Efforts of Interim Review Curb the Analyst Forecast's Walkdown?*

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Abstract

This study examines whether auditors restrain the analysts' opportunistic behavior as reviewing the companies' interim reports. Analysts' forecasts show a walkdown pattern in which their optimism has decreased as the earnings announcement date has approached. At the beginning of the year, there is a lack of high-quality benchmark information that enables information users to judge the accuracy of analyst's earnings forecasts. Thus, early in the year, analysts are highly inspired to disseminate optimistic forecasts in order to gain manager's favor. In this study, we examine adequate benchmarks prevent analysts from disclosing optimistically biased forecasts. We conjecture that auditors' efforts might mitigate analysts' walkdown pattern. To test this hypothesis, we use data from Korea, where it is mandatory to disclose auditor's review hours. We find that the analyst forecast's walkdown decreases with the ratio as well as the number of audit hours. It implies that an auditor's effort in reviewing interim financial information has a monitoring function that reduces analysts' opportunistic optimism at the beginning of the year. We conjecture that the tendency will be more pronounced when BIG4 auditors review the interim reports. Consistent with the prediction, BIG4 auditors' interim review effort is more effective in suppressing the analysts' walkdown.

Keywords: Earnings Forecast Walkdown, Interim Financial Information, Auditor Review Hour.

JEL Classification Code: M41, M42, G24.

1. Introduction

This study examines whether auditors' efforts in reviewing companies' interim financial information (hereafter, "IFI") can reduce the within-year walkdown pattern of analysts' earnings forecasts. On average, analysts' earnings forecasts begin with optimism, but the optimistic bias dwindles as the earnings announcement date comes close (Elton, Gruber, & Gultekin, 1984; Feng & McVay, 2010). This pattern of forecasts in which analysts' optimistic bias decreases as the earnings announcement date comes close is called "walkdown" (Bradshaw, Lee, & Peterson, 2016).

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Prior studies suggest that analyst forecast walkdowns are caused by analysts' opportunistic incentives to curry favor with managers (Dugar & Nathan, 1995; Chen & Matsumoto, 2006). As the most recent study, Bradshaw et al. (2016) show that forecasting difficulty intensifies analyst forecast walkdowns, because analysts are able to justify their biased forecasts easily when earnings are difficult to forecast. As an extension of the findings of Bradshaw et al. (2016), we examine whether analyst forecast walkdowns diminish as an auditor increases resource allocation for the review of IFI.

Bradshaw et al. (2016) document that analysts' optimism becomes stronger in situations in which it is difficult for investors to detect analysts' opportunistic optimism. At the beginning of the year, there are few benchmarks, and thus, it would be a burdensome for investors to judge the reliability of analysts' earnings forecasts. High-quality IFI that has been thoroughly reviewed by an external auditor would increase the overall quality and quantity of information accessible to investors about a firm. Better benchmarks facilitate investors' ability to detect analysts' opportunistic incentives, which prevents analysts from misleading investors with optimistically biased forecasts. We assume that the IFI that has been thoroughly reviewed by the auditor will serve as a high quality benchmark in judging the reliability of analyst forecasts. As the usefulness of IFI as a benchmark increases, walkdowns are reduced,

because analysts' opportunistic incentives are suppressed. Thus, we hypothesize that auditors' efforts in the review of IFI are negatively associated with analyst forecast walkdowns.

In line with our expectations, the proportion of time spent by an auditor on the review of IFI is negatively associated with analyst forecast walkdowns. The literature suggests that the proportion of time spent by an auditor on the review of IFI is positively connected to earnings quality of the interim and annual financial statements (Ettredge & Simon, 2000). Our results suggest that if the auditor allocates relatively more audit resources to reviewing the IFI, earnings quality of the interim financial statements improves, which limits analysts forecast walkdowns. Furthermore, we find that the number of hours that an auditor uses in the review of IFI is negatively related to analyst forecast walkdowns. Meanwhile, the number of hours spent on the audit of annual financial statements is not effective in curbing analysts forecast walkdowns. These results indicate that earnings quality of IFI plays a more significant role in improving the credibility of within-year analyst earnings forecasts than that of annual financial statements.

Our study has the following contribution to the extant studies. First, this is the first study to test whether auditors' review of IFI is associated with patterns of analyst earnings forecasts using a unique dataset disclosed by Korean listed companies. No study has focused on the effect of review hours on IFI due to data constraints. Korea is almost the only country that requires the auditor to disclose year-end audit hours and review hours separately. This study differs in that it examines how an auditor's efforts in the review of IFI can affect analyst's earnings forecast patterns after controlling total audit hours. Our results show that analysts' earnings forecast patterns may differ depending on how an auditor allocates time of reviewing on interim financial statements and auditing the annual financial statements, rather than how many hours the auditor puts in altogether.

Second, this study analyzes the usefulness of auditing in the capital market from a new perspective. Interim reports have high timeliness but low reliability. However, if the auditor puts a lot of effort into the review of IFI, it improves the credibility of the IFI and compensates for the shortcomings of the interim reports. Our empirical results show that analysts are difficult to stir capital markets with inaccurate earnings forecasts early in the year if the auditor thoroughly reviews the IFI. That is, auditors' efforts in the review of IFI have a positive role in increasing the reliability of within-year earnings forecasts. Our study presents empirical evidence to confirm the benefits of reviewing IFI by external auditors.

Third, this study provides important implications for what information users should pay attention to when evaluating the reliability of analysts' earnings forecasts. The analysts' forecasts early in the year are likely to be optimistically biased. Our results suggest that information users should pay more attention to the number of hours spent on the review of IFI and the proportion of review hours in order to evaluate the reliability of analysts' forecasts.

This study consists of the following steps. We review the prior studies and develop hypotheses. Then, we present a sample and a research model, and report empirical results. Finally, we present concluding remarks.

2. Literature Review & Hypotheses

2.1. Review of IFI by External Auditors

There are two types of financial statements: annual and interim. Interim financial statements are again divided into semi-annual and quarterly financial statements. Disclosure of quarterly financial statements began after 2000 in Korea. A listed company with total assets exceeding 500 billion KRW is obligated to review quarterly financial statements by an external auditor from the third quarter of 2001. The auditor who reviews IFI also audits the annual financial statements. The literature shows that an external auditor's review improves the earnings quality of the annual financial statements as well as that of quarterly financial statements (Ettredge & Simon, 2000).

In Korea, since 2014, an auditor should separately disclose the time spent on the review of IFI and the time spent on the audit of annual financial statements in its audit report. The time spent on the review of IFI is divided again by task and auditor rank. An example of audit hour disclosure is shown in the table below.

Table1: Disclosure Format of Audit

Number of audit participants and time spent		Quality management reviewer	CPA responsible for auditing			Expertise in computer audit, tax and valuation	Total
			Partner	**Registered CPA**	**Unregistered CPA**		
Number of audit participants		11	1	19	9	23	63
Time spent	Review	75	284	7,156	2,163	196	9,874
	Audit	381	364	7,867	3,091	1,595	13,298
	Total	456	648	15,023	5,254	1,791	23,172

2.2. Literature Review

2.2.1. Analysts' Optimism and Incentives

Analysts perform strategically and provide optimistic forecasts owing to their incentives. They provide optimistic forecasts to get high commissions from investment banking and trading activities. However, since inaccurate forecasts negatively impact analysts' reputation (Stickel, 1992; Mikhail, Walther, & Willis, 1999), analysts make strategic decisions by considering trade-offs between short-term trading profits gained through lie and undermining long-term reputation (Jackson, 2005, p.674).

Prior studies propose several theories to explain analysts' optimistic bias. First, analysts intentionally provide optimistic forecasts to attain investment banking activities, management relations, and trade generation (Dugar & Nathan, 1995). Dugar and Nathan (1995) find that analyst's optimistic bias is highly motivated by investment banking relationships. By contrast, Lin and McNichols (1998) cannot find any empirical evidence that affiliated analysts forecast more optimistically than unaffiliated analysts around seasoned equity offerings.

Another explanation for analysts' optimistic bias is that they make optimistic forecasts to induce management guidance. Management guidance enables analysts to forecast earnings more accurately, and thus, analysts have an incentive to issue more favorable forecasts in order to obtain management guidance (Mest & Plummer, 2003). The management guidance has increased rapidly over the past few decades in the U.S., but still it remains voluntary disclosure. On the other hand, management guidance is mandatory in Japan. Kato, Skinner, and Kunimura (2009) find a similar walkdown pattern of analysts' forecasts in Japan. The empirical evidence that a walkdown pattern of earnings forecasts is observed even in Japan where management guidance is mandatory implies that analysts do not make optimistic forecasts to obtain management guidance (Conroy & Harris, 1995; Hutton, 2005; Ota, 2011).

Other prior studies propose self-selection as an additional explanation for analysts' optimistic forecasts. If the opinion on the firm is unfavorable, the analyst tends to discontinue coverage on that firm, thereby we observe only optimistic forecasts (McNichols & O'Brien 1997). In a similar vein, analysts who have optimistic views tend to yield more optimistic forecasts earlier in the year, therefore, a walkdown pattern might be observed owing to selection bias of analysts (Barron, Byard, & Liang, 2013).

Overall, prior studies provide empirical evidence of analysts' earnings forecast optimism. However, there are mixed results on how analysts' incentives influence their forecast optimism. Bradshaw et al. (2016) argues that analysts tend to issue optimistic forecasts due to their opportunistic incentives only in situations where forecasting difficulty is high. In this study, we focus on auditors' continuous monitoring effect, which improves the usefulness of IFI. Extending Bradshaw et al. (2016), we expect that auditors' efforts to the review of IFI could reduce analysts' walkdown patterns.

2.2.2. Audit Quality and Analysts' Forecasts Properties

To analysts, financial statements are a significant component of their information set. Thus, if high-quality audits improve the financial statement, then the analysts' forecast accuracy that is reliant on this information might improve. Literature shows that client firms of Big N auditors or industry specialist auditors have higher financial reporting quality. Those firms have low discretionary accruals (Krishnan, 2003), fewer unintentional estimation errors (Watkins, Hillison, & Morecroft, 2004), low crash risk (Chae & Hwang, 2017), and high accuracy in forecasting future earnings. In sum, superior audit quality contributes to financial reporting quality, thereby improving analyst's information environment.

Prior studies propose two competing theories for how audit quality influences analysts' forecast accuracy. The first perspective is "decision usefulness." High-quality audits decrease manager's intentional reporting bias and unintentional measurement errors, thereby increasing financial reporting quality (Krishnan, 2003). Thus, analysts' forecast accuracy is likely to increase with financial reporting quality, because it provides useful and reliable information for analysts to forecast earnings (Ramnath, Rock, & Shane, 2008). Prior studies suggest that Big N audit firms and industry specialist auditors produce high-quality audits (Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Balsam, Krishnan, & Yang, 2003; Krishnan, 2003; Lim & Tan, 2010). Thus, analysts who follow the Big N auditors' clients or industry specialist auditors' clients forecast earnings more accurately (Behn, Choi, & Kang, 2008). However, Lawrence, Minutti-Meza, and Zhang (2011) argue that they do not find a significant difference in the attributes of the analysts' forecasts for client firms with Big N auditors and those with non-Big N auditors when employing propensity-score matching.

Another perspective is "intervention." The "decision usefulness" perspective devotes to the impact of high-quality audit on information that analysts use to forecast earnings, the "intervention" perspective is concerned with the impact of high-quality audit on realized future earnings.

High-quality auditing restricts management's attempts to manipulate reported earnings to meet or beat analysts' expectations, which in turn might be linked to lower analysts' forecast accuracy (greater forecast errors). Payne (2008) finds that client firms that are audited by the industry specialist auditors are less likely to meet or beat analysts' expectations and that their analysts' earnings forecasts are less accurate. However, Minutti-Meza (2013) argues that the likelihood of meeting or beating analysts' forecast consensus between firms with and without industry specialist auditors is not significant when employing a matched sample.

Meanwhile, prior researchers examine whether audit hours affect analysts' forecast accuracy. Audit hour is a quite impeccable proxy for audit effort, but there is little empirical research on this topic owing to unavailability of audit hour data.[2] We contribute to the extant studies by focusing on the effects of auditors' hours spent on interim financial statement reviews, not total auditors' hours, on the attributes of analysts' forecasts.

2.2.3. Auditor's Interim Financial Statements Review and Earnings Quality

Ettredge and Simon (2000) assess whether timely external auditors' review of interim financial statements (quarterly financial statements) constrain managers' manipulation of earnings. Timely review enhances credibility of the information available to capital market participants. They find that timely reviews reduce the deferral of adjustments in the latter quarters of the year. In summary, external auditors' review of quarterly reports can enhance financial reporting quality.

2.3. Hypotheses

Analyst forecast walkdowns refer to the pattern of forecasts in which analysts' optimistic bias decreases as an earnings announcement date approaches. When the forecast horizon is long, optimistically biased forecasts are more prevalent, since it is easy for an analyst to justify his/her biased forecasts. However, inaccurate forecasts around the earnings announcement date undermine analysts' reputation and negatively affect their career (Mikhail et al., 1999), so analysts' forecast bias decreases and their forecast accuracy increased as the earnings announcement date comes close (Elton, Gruber, & Gultekin, 1984; Feng & McVay, 2010).

Bradshaw et al. (2016) suggest that analysts' opportunistic incentives to curry favor with a manager leads to analyst forecast walkdowns. In addition, they argue that forecasting difficulty makes the analyst forecast walkdowns steeper. When forecasting difficulty is high, analysts can attribute their inaccurate forecasts to forecasting difficulties rather than their opportunistic incentives.

Prior literature shows that the analysts' optimism is more pronounced early in the year than at the end of the year (Elton et al., 1984; Feng & McVay, 2010). This finding is because at the beginning of the year, there are very few benchmarks to judge the accuracy of analysts' forecasts. As the forecast horizon becomes shorter, analysts' optimism diminishes because new additional information (for example, quarterly reports, media coverage, etc.) is released in the market. In particular, IFI that has been thoroughly reviewed by an auditor can serve as a good benchmark for investors to evaluate the reliability of analyst earnings forecasts. We predict that an auditor's review of IFI could be one way to curb analysts' earnings forecast walkdowns. Whether an auditor conducts a sufficient review of the IFI can be judged in two ways. If the auditor has spent a lot of time in reviewing the IFI, then the auditor can be considered to have made sufficient effort. In addition, if there is a high proportion of time spent on the review of IFI to total audit hours, then the firm's interim and annual financial statements are of high quality (Ettredge & Simon, 2000). We predict that analyst forecast walkdowns decline when the auditor puts in sufficient effort and resources to review the IFI. To test the relationship between analyst forecast walkdowns and auditors' review of IFI, we set the following hypotheses.

H1: The time spent on the review of interim financial information is negatively related to analyst forecast walkdowns.

H2: The proportion of the time spent on the review of interim financial information to total audit hours is negatively related to analyst forecast walkdowns.

3. Research Design

3.1. Sample

We use Korean listed companies as a sample. As we know, Korea is the only country where the auditor discloses review hours and audit hours separately. We start with non-financial listed firms from 2014 to 2016. Our sample begins in 2014, the first year of the mandatory disclosure of review

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[2] It is mandatory to disclose audit hours in only a few countries.

hours. We exclude non-December fiscal year-end firms because those firms' audit hours may be systematically differ from those with December year-end. Analysts' forecasts data and financial statement information are obtained from DataGuide and the KIS value database[3].

The number of final samples is 1,646. Table 2 presents the sample's distribution by year. The number of samples is generally evenly distributed by year.

Table 2: Sample Distribution by Year

Year	Frequency	Percent
2014	499	30.32
2015	577	35.05
2016	570	34.63
Total	1,646	100.00

Table 3 presents the sample's distribution by industry. Samples are widely distributed across industries. About 61.60% of the total sample is in manufacturing industry.

Table 3: Sample Distribution by Industry

Industry[1]	Frequency	Percent
Manufacturing	1,014	61.60
Information and communication	187	11.36
Professional and scientific activities	177	10.75
Wholesale and retail	106	6.44
Construction	50	3.04
Transportation and storage	34	2.07
Others	78	4.7
Total	1,646	100.00

[1] Industry classification is based on 1-digit Korea Standard Industry Code.

3.2. Research Design

We use the following Equation (1) for testing H1.

$$
\begin{aligned}
WD_{it} &= \beta_0 + \beta_1 RAH_{it} + \beta_2 AAH_{it} + \beta_3 TP_{it} + \beta_4 \Delta XFIN_{it} \\
&+ \beta_5 MF_{it} + \beta_6 STDROA_{it} + \beta_7 FLOSS_{it} + \beta_8 SIZE_{it} \\
&+ \beta_9 NUMEST_{it} + \beta_{10} HOR_{it} + \beta_{11} MTB_{it} + \beta_{12} BIG_{it} \\
&+ Year\ dummies + Industry\ dummies + \epsilon_{it}
\end{aligned}
\tag{1}
$$

where

WD =	(first earnings forecast of the year – last earnings forecast of the year)/beginning-of-year market value;
RAH =	log (review hours for IFI);
AAH =	log (audit hours for annual financial statements);
TP =	incentive score for more optimistic target prices in year *t*, expressed as a fractional rank of the mean of analysts' target price less the current stock

price, divided by the current stock price;

$\Delta XFIN$ =	incentive score for high external financing in year *t*, expressed as a fractional rank of the sum of debt financing and equity financing;
MF =	1 if the firm issues management guidance for the year, and 0 otherwise;
$STDROA$ =	standard deviation of earnings over the previous 5 years;
$FLOSS$ =	1 if the initial consensus earnings-per-share forecast<0, and 0 otherwise;
$SIZE$ =	log (beginning-of-year total assets);
$NUMEST$ =	number of analysts who follow the firm;
HOR =	log (end-of-year forecast date - beginning-of-year forecast date);
MTB =	beginning-of-year market-to-book ratio;
BIG =	1 if a firm's auditor is Big 4, and 0 otherwise;

In Equation (1), earnings walkdowns (*WD*) are measured as the first earnings forecast of the year minus the last earnings forecast of the year divided by the beginning-of-year market value, following Bradshaw et al. (2016). The interest variable in Equation (1) is an auditor's review hours for IFI (*RAH*). We predict that an auditor's effort in the review of IFI curbs analyst earnings walkdowns. Accordingly, we predict the sign of *RAH* to be negative.

We control for analysts' opportunistic incentives, following Bradshaw et al. (2016). They present more optimistic target prices (*TP*), commission fees from external financing (*△XFIN*), and management forecasts (*MF*) as empirical proxies for analysts' opportunistic incentives. When earnings are more volatile (*STDROA*) or analysts forecast a loss (*FLOSS*), forecasting difficulty increases, which leads to steeper walkdowns. Following prior literature, we control firm size (Lee, Kang, & Kim, 2018; Chae & Ryu, 2016) and the number of analysts. The firm size (*SIZE*) and the number of analysts (*NUMEST*) represent the firm's information environment. We control for the number of calendar days between the first and last earnings forecasts (*HOR*). If the forecast period is long, the walkdown becomes steeper because it is easy to justify the optimistic forecast. In addition, the market-to-book ratio is included, because forecast optimism is greater in growing companies (DeBondt & Thaler, 1990). Furthermore, we control for auditor size (*BIG*). Finally, we include industry and year dummies.

We use the following Equation (2) for testing H2. The interest variable in Equation (2) is the proportion of hours spent by an auditor on the review of IFI (*PR*). We expect that analyst earning walkdowns are weak if audit resources are spread evenly throughout the year. Accordingly, we predict the coefficient of *PR* is negative.

$$
\begin{aligned}
WD_{it} &= \beta_0 + \beta_1 PR_{it} + \beta_2 LTAH_{it} + \beta_3 TP_{it} + \beta_4 \Delta XFIN_{it} \\
&+ \beta_5 MF_{it} + \beta_6 STDROA_{it} + \beta_7 FLOSS_{it} + \beta_8 SIZE_{it} \\
&+ \beta_9 NUMEST_{it} + \beta_{10} HOR_{it} + \beta_{11} MTB_{it} + \beta_{12} BIG_{it} \\
&+ Year\ dummies + Industry\ dummies + \epsilon_{it}
\end{aligned}
\tag{2}
$$

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[3] KIS is a professional credit rating agency in Korea.

where

PR =	review hours of IFI/ (review hours of IFI + audit hours for annual financial statements);
LTAH =	log of the sum of review hours of IFI and audit hours of annual financial statements;

Since *PR* is a ratio variable, the effect of total audit hours (*LTAH*) on walkdown is controlled. Except for this change, the other control variables are the same as in Equation (1).

4. Empirical Results

4.1. Descriptive Statistics

Table 4 reports descriptive statistics of key variables. The mean of walkdowns is 0.020, which indicates that the beginning-of-year earnings forecast is greater than the end-of-year forecast by 2% of the firm's market value. The average of auditors' review hours for IFI (*RAH* in raw value) is 636 hours per year, and the annual average of auditors' audit hours for annual financial statements (*AAH* in raw value) is 918 hours. Furthermore, the mean of *PR* is 0.417, which means that on average, 41.7% of the total audit hours is used for the review of IFI and 58.3% for the audit of annual financial statements.

All the means of analysts' incentive variables (*PR, TP, △XFIN*) are 0.5, because these variables are fractional

ranks with values between 0 and 1. The mean of *MF* is 0.128, indicating that 12.8% of the sample issues management forecasts. The firms for which analysts forecast a loss (*FLOSS*) is only 2.2% of the total sample. The average period from the first to the last earnings forecast (*HOR* in raw value) is 235 days. The Big 4 auditor's client firms (*BIG*) account for 69.6% of the sample.

Table 4: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Median	Maximum
WD	0.020	0.071	-0.509	0.009	1.223
RAH	6.455	1.018	4.633	6.299	8.897
AAH	6.822	0.716	5.523	6.699	9.105
PR	0.417	0.138	0.024	0.413	0.768
TP	0.500	0.289	0.001	0.500	0.999
△XFIN	0.500	0.270	0.229	0.461	0.999
MF	0.128	0.334	0.000	0.000	1.000
STDROA	0.047	0.052	0.005	0.032	0.341
FLOSS	0.022	0.148	0.000	0.000	1.000
LTAH	7.391	0.795	6.118	7.255	9.682
SIZE	26.864	1.554	24.297	26.568	31.161
NUMEST	3.053	3.223	1.000	1.585	15.805
HOR	5.460	0.362	3.540	5.613	5.613
MTB	1.988	1.675	0.337	1.448	9.629
BIG	0.696	0.460	0.000	1.000	1.000

[1] Refer to Equations (1) and (2) for the definitions of variables.

Table 5: Correlation Matrix for Main Variables

	WD	RAH	AAH	PR	TP	△XFIN	MF	STDROA	FLOSS	LTAH	SIZE	NUMEST	HOR	MTB
RAH	0.03													
	(0.25)													
AAH	0.07	0.81												
	(0.00)	(0.00)												
PR	-0.04	0.72	0.19											
	(0.15)	(0.00)	(0.00)											
TP	0.20	-0.10	-0.08	-0.07										
	(0.00)	(0.00)	(0.00)	(0.00)										
△XFIN	0.07	0.11	0.14	0.03	0.01									
	(0.00)	(0.00)	(0.00)	(0.26)	(0.81)									
MF	0.09	0.25	0.28	0.08	-0.06	0.12								
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)								
STDROA	0.02	-0.12	-0.11	-0.08	0.07	0.06	-0.06							
	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)							
FLOSS	0.04	0.02	0.03	0.01	0.03	0.09	-0.02	0.10						
	(0.11)	(0.32)	(0.24)	(0.72)	(0.16)	(0.39)	(0.39)	(0.00)						
LTAH	0.05	0.95	0.95	0.48	-0.09	0.13	0.28	-0.12	0.03					
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.21)					
SIZE	0.05	0.87	0.81	0.51	-0.11	0.10	0.29	-0.15	0.01	0.88				
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.67)	(0.00)				
NUMEST	-0.02	0.63	0.67	0.27	-0.12	0.08	0.31	-0.07	-0.04	0.68	0.72			
	(0.47)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.09)	(0.00)	(0.00)			
HOR	0.08	0.22	0.21	0.11	-0.01	-0.00	0.08	-0.04	-0.02	0.23	0.24	0.24		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.68)	(1.00)	(0.00)	(0.11)	(0.47)	(0.00)	(0.00)	(0.00)		
MTB	-0.07	-0.20	-0.17	-0.14	-0.19	0.03	-0.02	0.12	0.03	-0.20	-0.29	0.02	-0.02	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.23)	(0.42)	(0.00)	(0.30)	(0.00)	(0.00)	(0.34)	(0.43)	
BIG	0.00	0.49	0.49	0.25	-0.05	-0.03	0.09	-0.09	-0.01	0.51	0.42	0.28	0.10	-0.11
	(0.94)	(0.00)	(0.00)	(0.00)	(0.03)	(0.26)	(0.00)	(0.00)	(0.79)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

[1] p-values are reported in parentheses.
[2] Refer to Equations (1) and (2) for the definitions of variables.

Table 5 reports the Pearson correlation among interest variables. [4] The association between walkdowns and auditors' efforts in the review of IFI (*RAH*, *PR*) is not significant. On the other hand, walkdowns are positively associated with the variables *TP*, *△XFIN*, and *MF*, which suggests that analysts' optimism early in the year comes from the opportunistic incentives to raise target price and brokerage commissions, but is not intended to induce management forecasts. Furthermore, walkdowns are positively related to *AAH*, *LTAH*, and *SIZE*, which indicates that a large company with more audit hours exhibits steeper walkdowns.

4.2. Multivariate Analyses

Table 6 shows the regression results using Equation (1). In Table 6, the coefficient of *RAH* is significantly negative, while that of *AAH* is positive, which suggests that walkdowns decrease with the number of hours that an auditor spends on the review of IFI, whereas the number of hours that an auditor spends on the audit of annual financial statements has the opposite effect. This result implies that an auditor's efforts in reviewing IFI are more effective than that for annual financial statements for the purpose of reducing analysts' optimism early in the year. Since there is a considerable time gap between the date when the analyst first issues his or her earnings forecasts and the disclosure date of the annual financial statements, the auditor's efforts in auditing annual financial statements seem to have no substantial effect on the mitigation of walkdowns. These results support H1.

Consistent with Bradshaw et al. (2016), our results show that walkdowns are positively correlated with *TP* and *△XFIN*. This finding suggests that when an analyst has incentive to raise target prices and brokerage commissions, walkdowns increase. A firm with management forecasts exhibits steeper walkdowns. Furthermore, if the period between the first and last forecasts (*HOR*) is long, then walkdowns increase. On the other hand, walkdowns decrease with the number of analysts following the firm (*NUMEST*).

Table 6: The effect of the number of hours spent by an auditor reviewing IFI on analyst earnings walkdowns

Variables	
Intercept	-0.268***
	(-4.193)
RAH	-0.007*
	(-1.933)
AAH	0.014***
	(2.915)

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[4] In order to check the multicollinearity problem due to the high correlation between *RAH* and *LAH*, we calculate the VIF. We find that VIF does not exceed 10 in all models.

TP	0.050***
	(8.156)
△XFIN	0.012*
	(1.866)
MF	0.019***
	(3.484)
STDROA	0.032
	(0.929)
FLOSS	0.008
	(0.682)
SIZE	0.005*
	(1.716)
NUMEST	-0.003***
	(-3.714)
HOR	0.017***
	(3.535)
MTB	0.000
	(0.379)
BIG	-0.000
	(-0.094)
Year dummies	Included
Industry dummies	Included
N	1,646
Adj. R^2	0.073
F-value	5.477***

[1] *, ** and *** represent significance at the 0.1, 0.05, and 0.01 levels, respectively.
[2] t-values are reported in parentheses.
[3] Refer to Equations (1) and (2) for the definitions of variables.

Table 7 presents the regression results using Equation (2). In Table 7, the coefficient of *PR* is significantly negative at the 1% level, which suggests that walkdowns decrease with the proportion of time spent by an auditor reviewing IFI. These results show that analysts' first earnings forecast of the year can be less optimistic when the audit efforts are evenly distributed throughout the year by the review of IFI. It supports H2. The regression results of other control variables are similar to those of table 6.

Table 7: The effect of the proportion of time spent by an auditor reviewing IFI on analyst earnings walkdowns

Variables	
Intercept	-0.255***
	(-4.186)
PR	-0.043***
	(-2.943)
TP	0.050***
	(8.164)
△XFIN	0.012*
	(1.875)
MF	0.019***
	(3.485)
STDROA	0.032
	(0.931)
FLOSS	0.008
	(0.694)

LATH	0.005
	(1.076)
SIZE	0.005*
	(1.837)
NUMEST	-0.003***
	(-3.687)
HOR	0.017***
	(3.534)
MTB	0.000
	(0.387)
BIG	-0.000
	(-0.027)
Year dummies	Included
Industry dummies	Included
N	1,646
Adj. R^2	0.073
F-value	5.465***

[1] *, **, and *** represent significance at the 0.1, 0.05, and 0.01 levels, respectively.
[2] t-values are reported in parentheses.
[3] Refer to Equations (1) and (2) for the definitions of variables.

STDROA	0.034	0.063
	(0.741)	(1.383)
FLOSS	0.008	0.001
	(0.541)	(0.045)
SIZE	0.008**	0.000
	(2.054)	(0.107)
NUMEST	-0.003***	-0.003
	(-3.387)	(-1.423)
HOR	0.017**	0.017***
	(2.530)	(2.777)
MTB	0.001	-0.002
	(0.921)	(-1.623)
Year dummies	Included	Included
Industry dummies	Included	Included
N	1,145	501
Adj. R^2	0.064	0.124
F-value	3.913***	4.064***

[1] *, ** and *** represent significance at the 0.1, 0.05, and 0.01 levels, respectively.
[2] t-values are reported in parentheses.
[3] Refer to Equations (1) and (2) for the definitions of variables.

4.3. Additional Test

In Table 8, we analyze whether the type of auditor affects the relationship between walkdowns and review hours. We divide the sample into Big4 auditor's clients and non-Big4 auditor's clients and retest Eq. (1). Models 1 and 2 are the results for Big4 client subsample and non-Big4 client subsample, respectively.

In Table 8, the coefficient of *RAH* is significant only in the Big4 auditor's client subsample (Model 1) and not statistically significant in the non-Big4 auditor's client subsample (Model 2). It implies that the BIG4 auditor's interim review effort is more effective in suppressing the analyst forecast walkdown.

Table 8: The effect of the auditor type (Big 4 vs. non-Big 4 auditor)

Variables	Model 1 (BIG4 clients)	Model 2 (non-BIG4 clients)
Intercept	-0.322***	-0.164*
	(-3.824)	(-1.747)
RAH	-0.011**	0.001
	(-2.182)	(0.260)
AAH	0.013**	0.011
	(2.191)	(1.574)
TP	0.052***	0.040***
	(6.479)	(4.955)
△XFIN	0.014	0.011
	(1.583)	(1.267)
MF	0.020***	0.013
	(2.863)	(1.581)

5. Conclusions

This study examines whether an auditor's efforts in the review of IFI can reduce the within-year walkdown of analysts' earnings forecasts. The higher proportion of time spent by an auditor on the review of IFI implies that audit resources are not focused on the end-of-the year and are allocated evenly throughout the year. Sufficient resource input in the review of quarterly financial statements enhances the overall quality of IFI (Ettredge & Simon, 2000). High-quality IFI could be a good benchmark for judging the reliability of analysts' earnings forecasts, thereby limiting analysts to making optimistic forecasts early in the year. Our empirical results show that when the auditor puts in a lot of effort in the review of IFI, the analysts' optimism about earnings forecasts early in the year decreases.

This study sheds light on discussions on expanding and strengthening auditors' review of IFI. This study shows that auditors' efforts in the review of IFI plays an significant role in curbing the analysts' optimism early in the year. Although earnings forecasts are important for making investment decisions, there is insufficient understanding about the determinants of reliability of analysts' forecasts. A policy implication of this study is that supervisory authorities need to force auditors to separately disclose the time spent on the review of IFI and the time spent on the audit of annual financial statements. This detailed disclosure would help

investors judge the reliability of analysts' forecasts. Our study is subject to the usual limitations of archival studies. First, there may be disagreements as to how to measure analyst forecast walkdowns. In this study, analyst forecast walkdowns are measured as the difference between the first and the last earnings forecast. Although this method is widely used in previous studies, it is limited in that it uses only two forecasts, ignoring other forecasts released throughout the year. Second, this study assumes that the influence of audit hours on financial reporting quality is homogeneous regardless of the auditor's rank. However, experienced auditors might be able to review the IFI more effectively using less hours. Future research is expected to address the effect of the auditor's rank on the relationship between the auditor's review efforts and the analyst forecast walkdowns.

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