Investor use of revised analyst information following management disclosures

Kyunbeom Jeong |

Published online: 12 May 2020.

Submit your article to this journal ⬈

Article views: 560

View related articles ⬈

View Crossmark data ⬈

*Corresponding author: Kyunbeom Jeong, School of Business Administration, Hansung University, 116, Samseongyo-ro 16-gil, Seongbuk-gu, Seoul 02876, Korea.
E-mail: kbjeong@hansung.ac.kr

ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

Investor use of revised analyst information following management disclosures

Kyunbeom Jeong*

Abstract: This study investigates the use of revised analyst forecast information that is released following management disclosures. I extend the prior literature by examining the relationship between the contents of analyst forecast revisions and the content of management disclosures. I provide evidence that investor reaction is greater in response to analyst revisions that are consistent with prior management disclosures. I also find that the amount of new information is greater in the analyst revisions that are inconsistent with management disclosures, which suggests that the inconsistency of analyst information is a result of the new information. Additionally, I find that the new information causes a more significant effect if the analyst revisions are historically more accurate than the management forecasts. These results suggest that investors consider not only the timing sequence of analyst information with respect to the corporate disclosures, but also the relationship between the analyst information and the corporate disclosure in their use of revised analyst information.

Keywords: analyst forecast revision; management disclosure; investor reaction; timing sequence of information

1. Introduction
Analysts play two significant and different roles with respect to the capital market, information discovery and information interpretation (e.g., Chen et al., 2010; Ivkovic´ & Jegadeesh, 2004;

ABOUT THE AUTHOR
Kyunbeom Jeong is an Assistant Professor at Hansung Unversity, Korea. He received his Ph.D. degree from Korea Advanced Institute of Science and Technology(KAIST). His areas of interest include financial accounting, management accounting and accounting audit.

PUBLIC INTEREST STATEMENT
Investors are interested in the information of the firms that can be the candidates of their investment. Two major information for them are management disclosures and analyst forecasts. There are many studies that each of them has an effect on investors' decisions, however there is no study that empirically compare them. This study figures out the effect of analyst revision information after the corporate disclosures. I find that investors react greater in the analyst revisions that are consistent with prior management disclosures. Additionally, I demonstrate that inconsistent analyst revisions contain a greater amount of new information than consistent analyst revisions. These results are consistent with the conjecture that investors simultaneously consider firm characteristics, analyst characteristics, the timing sequence, and the contents of analyst information.

Ramnath et al., 2008). Analysts can discover new information utilizing their privileged private or timely information production capability concerning the firms that they follow and, at the same time, can apply their expertise to interpret publicly disclosed information for investors. The prior evidence with respect to these two roles is inconsistent and controversial. Some studies show that the market reaction to earnings announcements tends to be lower for firms that are followed by a higher number of analysts, which is consistent with the information discovery role (e.g., Dempsey, 1989; Shores, 1990). However, Francis et al. (2002) and Frankel et al. (2006) found that analyst reports and subsequent earnings announcements complement each other, suggesting that the information interpretative role of analysts is dominant. Recently, however, Chen et al. (2010) noted the sample selection bias of Francis et al. (2002) and found a conflicting result implying that analyst revisions preempt subsequent earnings announcements. Overall, the evidence suggests that the information discovery role is dominant if analyst information is provided before the earnings announcements, whereas the information interpretative role is dominant for analyst information that is released following the earnings announcements.

These prior studies focus on the timing sequence of analyst forecast revision information with respect to earnings announcements. Livnat and Zhang (2012) examined the relationship between the promptness of analyst revisions and investor reaction to the revisions. They found that investors perceive promptly issued revisions following corporate public disclosures to be more valuable than late revisions. However, the promptness in their study does not seem to differ significantly according to the timing measure.

This study focuses on the content of analyst revisions with respect to corporate disclosures released prior to analyst revisions. The study examines the relationship between the content of the analyst revisions and the content of prior management disclosures. The subsequent effect on investor reaction to analyst revisions and the timing sequence is examined as in previous studies. I first examine whether investor reaction to the analyst revisions differs depending on the consistent nature of the information in the analyst revisions with the management disclosures. An analyst revision is considered consistent with a management disclosure if both are revised in the same direction, either upwards or downwards. Revisions that are in opposite directions are considered inconsistent. The results show that investor reaction to analyst revisions is greater when the revisions are consistent with management disclosures. Second, I investigate the differences in the amount of new information that is available in consistent and inconsistent analyst revisions. I conjecture that the inconsistency between analyst revisions and prior management disclosures is a result of the new information. This would provide evidence of the discovery role of information that has been claimed in existing studies. If this theory is accurate, the amount of new information would be greater for the inconsistent analyst revisions. Using the information content as a measure of new information, the results support this conjecture. Moreover, I test whether the quality of information affects the information content of new information and find that for the inconsistent analyst revisions, the new information has a greater effect when the analyst revisions are historically more accurate than the management forecasts.

This study contributes to the existing financial analyst literature in the following ways. Prior studies have focused on the timing sequence of analyst forecast revisions with respect to corporate disclosures. However, prior studies have not considered the content of the analyst forecast revisions or the corporate disclosures and claim that the role of information is predominantly one of interpretation or discovery. This study shows that the role of information is not determined solely by the timing sequence of information but also by its contents. An examination of investor reaction to analyst revisions and the relationship between the revision content with prior management disclosure content implies that the content should be a factor for consideration in addition to the timing sequence. This evidence contributes to the explanation of the investor decision making process.

The remainder of this study proceeds as follows. Section 2 presents related research and develops the hypotheses. Section 3 explains the sample and research design used in this study. Section 4 describes the hypotheses test results. Section 5 reports additional analyses, and Section 6 concludes the study.

2. Related research and hypotheses

Prior studies have investigated the two main roles of analysts with respect to capital markets. The analyst roles are based on different theories. The studies that support the information discovery role (e.g., Dempsey, 1989; Shores, 1990) explained their results based on the Holthausen and Verrecchia (1988) or Demski and Feltham (1994) model. Holthausen and Verrecchia (1988) showed that an increase in the quality of the first public information signal leads to a decrease in the ex-ante variability of price change to the second signal, suggesting that the first public information announcement preempts the second public information announcement (i.e., substitution). Demski and Feltham (1994) analytically modeled the market reaction to financial reports conditional on a certain prior information signal and found a similar substitution. These models concluded that analyst revision information and the subsequent earnings announcements substitute for each other. In this situation, analysts fulfil an information discovery role.

However, Francis et al. (2002) and Frankel et al. (2006) provided evidence that the information content of analyst research and earnings announcements complement each other. Although not based on any theoretical underpinnings, these results provide an alternative explanation. For example, Kim and Verrecchia (1994) argued that market participants have different abilities in the interpretation of public announcements. Financial analysts typically possess experience and expertise with respect to the firms or industries and are better able to process a substantial amount of information. This can assist investors in the interpretation of the information contained in corporate disclosures.

Chen et al. (2010) clarify when one of the two analyst roles dominates the other. Analyst reports that are disclosed before an earnings announcement preempt the earnings announcements that follow, whereas analyst reports that are disclosed after an earnings announcement can be more informative if they effectively interpret the earnings announcement information. The authors find that the analyst reports disclosed before an earnings announcement reflect a dominant information discovery role of analysts, whereas the information interpretative role is dominant in the analyst reports issued after an earnings announcement. The study, however, only examines the relationship between the timing of the release of the analyst research reports and the earnings announcements and the role of the analyst information. Livnat and Zhang (2012) attempted to expand their study using the promptness of analyst revisions with respect to corporate public disclosures. The authors argued that because analysts compete for trading volume (Cooper et al., 2001), and possess incentive to process the information and issue early revisions, the investors value this interpreted information. The authors found that promptly revised analyst forecasts are valuable to investors. However, the promptness measure can be considered another type of timing measure. This study suggests the existence of other important factors that can affect investor reaction to analyst research—the content of analyst revisions compared with corporate disclosures. The prior studies imply that the analyst revisions that follow management forecasts predominantly fulfil an information interpretative role. However, among the analyst revisions that are issued after the management forecasts, certain analyst revisions would be interpreted differently by investors depending on the content compared with the corporate disclosures. For example, if corporate disclosure is downwardly adjusted in nature, and analysts revise their forecasts in a consistently downward manner, investors would perceive the analyst interpretation as confirmation of the management disclosure and would react more significantly than if the management disclosure and analyst revisions were inconsistent. This is because investors are confused, and uncertainties are created if the two information events are inconsistent. In such a case, even if the timing sequences of the two information events are the same, investors can react differently to the analyst revisions according to the contents of the information events. Therefore, I hypothesize the following:

Hypothesis 1: Investor reaction to analyst forecast revisions is greater when the direction of the analyst revisions is consistent with the direction of prior management disclosures.

The first hypothesis suggests that the interpretative role of analyst revisions following management disclosures is manifested when the analyst revisions are consistent with the prior management disclosures. The second hypothesis proposes that certain analyst revisions predominantly fill an information discovery role despite their release following management disclosures and possible inconsistency with prior management disclosures. Analyst revisions can be inconsistent with management disclosures for many reasons. One significant reason is that analysts may possess new information that differs from the management disclosures. In such a case, if the new information that is in conflict with prior management disclosures is reflected in the forecast revisions, it represents new information for investors. This is similar to the information discovery role referenced in the prior studies. The information discovery role is explained in prior studies as the preemption effect of initial information on the second public information announcement. For example, Holthausen and Verrecchia ([1988](#)) showed that the first public information announcement preempts the second announcement. Prior analyst research can preemptively discover information that will appear in later management disclosures. Chen et al. ([2010](#)) also used the term information discovery role when referring to the analyst forecasts issued before the earnings announcements. This study examines analyst revisions following the management disclosures and posits that an information discovery role is also evident in the analyst revisions that are inconsistent with the prior management forecasts.[1] If analysts possess new information with respect to management disclosure, the revisions released after the management disclosure will serve an information discovery purpose for the investor. The role of analysts in this situation can be measured by the relative information content of analyst revisions with respect to management forecasts (e.g., Chen et al., [2010](#); Francis et al., [2002](#)). I propose that when the analyst revisions are inconsistent with prior management disclosure, the revisions provide new information to a greater extent than revisions that are inconsistent with management disclosures. Therefore, the relative information content of the analyst revisions with respect to management disclosures is greater if the content is inconsistent with prior management disclosures, as proposed in Hypothesis 2.

Hypothesis 2: The relative information content of analyst revisions to management disclosures is greater when the analyst revisions are inconsistent with prior management disclosures.

Hypothesis 2 suggests that analyst revisions contain new information to a greater extent than management disclosures when the two are inconsistent. The effect of the new information would, therefore, differ depending on the quality of this new information. Abarbanell et al. ([1995](#)) predicted that the investor reaction increases according to the expected accuracy of the analyst forecasts. Prior empirical studies also demonstrate results consistent with this theoretical prediction (e.g., Gleason & Lee, [2003](#); Park & Stice, [2000](#); Stickel, [1992](#)). Therefore, I predict that the relative information content of the new information would depend on its quality. As a proxy for new information quality, I use the historical accuracy of analyst revisions with management disclosures because investors can easily evaluate the quality based on past accuracy.

Hypothesis 3: Given Hypothesis 2, the relative information content of analyst revisions compared to management disclosure content is greater when the analyst reviews are historically more accurate than the management disclosures.

3. Sample and research design

3.1. Sample and data

The sample consists of firms from the *Compustat, CRSP, IBES*, and *FirstCall* databases for the period 1995 to 2010.[2] The management forecasts, analyst forecast consensus, and actual earnings data are obtained from the *FirstCall* database. The stock prices and firm financial data are obtained

✤ cogent ··· business & management

Table 1. Sample selection	
Panel A: Sample selection procedures for hypothesis 1	
Selection criteria	Number of analyst forecast revisions
Analyst forecast revisions issued within one week period after management disclosures	389,769
Less:	
Observations without stock return data on the day of management disclosure	12,916
Observations without stock return data on the day of analyst revisions	2,717
Observations without data for other control variables	28,471
The top and bottom 1% extreme values of all continuous variables	49,371
Final Sample	296,294
Panel B: Sample selection procedures for hypotheses 2 and 3	
Selection criteria	Number of analyst forecast revisions
Analyst forecast revisions (using consensus) issued within one week period after management disclosures	169,954
Less:	
Observations without the value of median consensus	8,475
Observations without pre-existing analyst consensus	30,250
Observations reduced in calculating *IC_AR* variable (Multiple forecast revisions are aggregated into a single sum)	65,402
Observations without data for return volatility variables (*Std_AAR, Mean_AAR*)	9,934
Observations without data for historical reputation variables	6,810
Observations without data for *IC_PAR* variable	16,631
Observations without other control variables	15,819
The top and bottom 1% extreme values of all continuous variables	1,421
Final Sample	15,212

from the *CRSP, Compustat Annual*, and *Quarterly* databases. I used the *IBES* database for the detailed analyst revision data.

The samples used to test Hypothesis 1 are different from the samples used to test Hypotheses 2 and 3. The sample for the tests of Hypotheses 2 and 3 use only one observation for each management forecast, whereas the sample for Hypothesis 1 has many observations for each management forecast.[3] This results in a sample size of 296,294 observations for Hypothesis 1 and 15,212 observations for Hypotheses 2 and 3.[4] Table 1 describes in detail the sample selection procedures.

3.2. Research design and variable definitions

3.2.1. The empirical model for Hypothesis 1
Hypothesis 1 investigates investor reaction to analyst revisions according to the consistencies or inconsistencies between the management disclosure and the revisions. Consistent with Livnat and Zhang (2012), the following regression model is used to test Hypothesis 1:

$$
\begin{aligned}
Investor\_R = \ &\beta_0 + \beta_1 Revise + \beta_2 Revise \times Agree + \beta_3 Revise \times FirmSize + \beta_4 Revise \times BM \\
&+ \beta_5 Revise \times A\_Exp + \beta_6 Revise \times Numfirm + \beta_7 Revise \times Broker \\
&+ \beta_8 Revise \times Horizon + \beta_9 Agree + \beta_{10} FirmSize + \beta_{11} BM + \beta_{12} A\_Exp \\
&+ \beta_{13} Numfirm + \beta_{14} Broker + \beta_{15} Horizon + \varepsilon
\end{aligned}
\tag{1}
$$

The dependent variable, investor reaction (*Investor_R*), is defined as the abnormal returns over three trading days centered on the analyst forecast revision day. The abnormal returns are calculated using size and book-to-market matched portfolios, following Fama and French (1993). The analyst forecast revision (*Revise*) is calculated by the change in the previous forecasted value of the same analyst for the same forecast period, deflated by the end-of-the-month stock price prior to the forecast revision. I rank this value according to deciles, divide by nine, and subtract 0.5 to prevent outlier problems, following Elgers et al. (2001) and Livnat and Zhang (2012). The coefficient on *Revise* is expected to be positive, consistent with the prior literature.

To examine the effect of other factors on the relationship between analyst forecast revisions and investor reaction, I use the interaction between the *Revise* variable and the other main variables that could affect the relationship including *Agree*. The *Agree* variable is equal to 1 if the current forecast has been revised in the same direction as the management forecast, which is calculated as the current management forecast minus the analyst's previous forecast. It is 0 otherwise. Thus, the *Agree* variable indicates the consistency of the management forecast with the analyst revision with respect to previous analyst forecasts. Other variables in the model are used as control variables. First, I control the firm-specific variables, *FirmSize* and *BM*. *FirmSize* is measured as the market value of equity at the end of the month prior to the analyst revision, and *BM* is calculated as the book-to-market ratio at the end of the month prior to the revision. Second, I control the analyst-specific variables, *A_Exp*, which represents the number of days since the analyst's first EPS forecast on *IBES*; *Numfirm*, which is calculated as the number of firms that the analyst covers at month-end prior to the analyst revision; and *Broker*, which represents the number of analysts in the employing brokerage house at the month-end prior to the analyst revision. Third, I also control for the revision-specific variable, *Horizon*, which is the number of days from the analyst revision to the end of the revision forecast period. For the *FrimSize, A_Exp, Horizon, Numfirm*, and *Broker* variables, I use the log value to reduce the outlier effects. Appendix 1 explains the detailed definitions of variables.

Hypothesis 1 expects β_2 to be positive. Additionally, based on prior literature, I predict that the *FrimSize, BM, Numfirm*, and *Horizon* variables will be negatively associated with the investor reaction variable, and a positive relation is expected with respect to the *A_Exp* and *Broker* variables.

3.2.2. The empirical model for Hypothesis 2

I use an alternative research design for the second hypothesis. The second hypothesis examines the relative information content of the analyst revisions to the management disclosure content depending on the consistency of the analyst revisions with the prior management forecast. This is tested using the following regression model based on Chen et al. (2010):

$$IC\_AR = \beta_0 + \beta_1 IC\_MG + \beta_2 IC\_MG \times Agree\_C + \beta_3 Agree\_C + \beta_4 Std\_AAR + \beta_5 Mean\_AAR + \beta_6 FrimSize + \beta_7 Analysts + \beta_8 Numfirm + \beta_9 IC\_PAR + \varepsilon. \tag{2}$$

The dependent variable *IC_AR* represents the information content of analyst revisions during the one-week period following management disclosure, which is calculated as the absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week of management disclosure. If there are no analyst revisions in the week following the management disclosure, the *IC_AR* is set as a missing variable. *IC_MG*, the information content of management disclosure, is measured as the absolute value of abnormal returns on the management disclosure announcement day. The coefficient of *IC_MG* is expected to be positive, consistent with Chen et al. (2010). The *Agree_C* variable interacts with *IC_MG* and represents the consistency of the analyst revisions with management disclosure with respect to the preexisting consensus of analyst forecasts. It is equal to 1 if the sign of the value of management disclosure minus the current median analyst consensus forecast and the changes in the analyst revisions (the current consensus forecast minus the previous consensus forecast) are identical, and 0 otherwise. The positive coefficient of the

interaction between variables *IC_MG* and *Agree_C* indicates that the information content of analyst revisions is greater than that of the management forecasts, as predicted by Hypothesis 2.

Other variables are used as control variables. *Std_AAR* and *Mean_AAR* are used to control the influence of return volatility. *Std_AAR* is the standard deviation of the absolute value of daily abnormal returns in the same quarter as management disclosure, and *Mean_AAR* is the mean of the absolute value of daily abnormal returns in the same quarter as management disclosure. *FrimSize, Analysts,* and *IC_PAR* control the effect of the pre-disclosure environment. *FrimSize* is calculated in the same way as the test for Hypothesis 1, *Analysts* represents the log of the total number of analyst forecasts used in consensus following the management forecast, and *IC_PAR* is the sum of the abnormal returns for each day with analyst research for each of the six weeks prior to management disclosure.

3.2.3. The empirical model for Hypothesis 3

Hypothesis 3 examines the effect of the quality of information on Hypothesis 2. It is tested using the inconsistent samples only. The consistent subsample has a value of 0 on the *Agree_C* variable, which means that the direction of the analyst revisions is not consistent with management disclosures. The following equation is used to test Hypothesis 3. It is the same as Equation (2) with the exception of the interaction variable between *IC_MG* and *R_Repu*.

$$IC\_AR = \beta_0 + \beta_1 IC\_MG + \beta_2 IC\_MG \times R\_Repu + \beta_3 R\_Repu + \beta_4 Std\_AAR + \beta_5 Mean\_AAR$$
$$+ \beta_6 FrimSize + \beta_7 Analysts + \beta_8 Numfirm + \beta_9 IC\_PAR + \varepsilon. \tag{3}$$

The *R_Repu* variable is a proxy for the information quality of the analyst revisions compared to the management forecasts and measures the relative historical accuracy of each. It is a dichotomous variable that is equal to 1 if the average management forecast accuracy (= -|MFE|) in the last three years is less than or equal to the average analyst forecast accuracy (= -|AFE|) for the same period, and 0 otherwise. MFE is calculated as the value of the management earnings forecast minus the actual value of earnings, and AFE is measured as the value of the analyst earnings forecast consensus minus the actual value of earnings. Hypothesis 3 is supported if the coefficient β_2 has a positive value.

4. The empirical results

4.1. The descriptive statistics and univariate test results

Table 2 reports the descriptive statistics of variables that are used in this study and the univariate test results. Panel A provides the descriptive statistics of the variables for the testing of Hypothesis 1, and Panel B provides the descriptive statistics for the testing of Hypotheses 2 and 3. The means of *Agree* and *Agree_C* are 0.808 and 0.690, respectively. This implies that a large proportion of analyst revisions is consistent with management disclosure. This is confirmed by the number of observations in the two subsamples, consistent versus inconsistent subsamples (239,306 versus 56,988, respectively and 10,500 versus 4,712, respectively). Other variables show qualitatively similar statistics to the prior literature. For the univariate test results, including the investor reaction variable, all of the variables used in the test of Hypothesis 1 have significantly different mean values depending on the consistency between the information in the analyst revisions and the information in the management disclosures. Panel B shows that the majority of the variables used in the models for testing Hypotheses 2 and 3 also have different means, with the exception of the return volatility variables *Std_AAR* and *Mean_AAR*.

The correlation coefficients for all variables are reported in Table 3. I also report the correlations separately for the variables used in the testing of Hypotheses1, 2, and 3. In Panel A, *Revise* is positively correlated with *Investor_R*. This implies that if the analyst revisions are announced, investors will positively react to these revisions. Additionally, in Panel B, *IC_MG* is significantly and positively correlated with *IC_AR*, which implies that the mean analyst revisions fulfil an information interpretative role, consistent with prior literature. Certain variables in Panel B are

cogent • business & management

Table 2. Descriptive statistics for variables and univariate test results

Panel A: Variables used in the tests of hypothesis 1

Variable	Full Sample (n = 296,294)					Consistent (n = 239,306)	Inconsistent (n = 56,988)
	Mean	Std.Dev	25%	Median	75%	Mean	Mean
Agree	0.808	0.394	1.000	1.000	1.000	1.000	0.000 ***
Revise	-0.001	0.005	-0.002	0.000	0.001	-0.001	-0.001 ***
Investor_R	-0.023	0.170	-0.130	-0.032	0.083	-0.021	-0.029 ***
FrimSize	8.077	1.515	6.929	7.998	9.181	8.038	8.238 ***
BM	0.410	0.243	0.233	0.355	0.537	0.412	0.400 ***
A_Exp	7.443	0.830	6.997	7.649	8.071	7.447	7.428 ***
Numfirm	2.729	0.405	2.485	2.773	2.996	2.730	2.722 ***
Broker	3.752	1.034	3.178	3.892	4.654	3.744	3.786 ***
Horizon	4.875	0.851	4.500	4.718	5.631	4.844	5.005 ***

Panel B: Variables used in the tests of hypotheses 2 and 3

Variable	Full Sample (n = 15,212)					Consistent (n = 10,500)	Inconsistent (n = 4,712)
	Mean	Std.Dev	25%	Median	75%	Mean	Mean
Agree_C	0.690	0.462	0.000	1.000	1.000	0.795	0.000 ***
R_Repu	0.806	0.395	1.000	1.000	1.000	0.795	0.832 ***
IC_MG	0.057	0.049	0.021	0.043	0.076	0.058	0.054 ***
IC_AR	0.065	0.060	0.024	0.048	0.086	0.066	0.063 **
Std_AAR	0.045	0.018	0.032	0.039	0.055	0.045	0.045
Mean_AAR	0.055	0.025	0.035	0.052	0.071	0.056	0.055
FrimSize	8.213	1.488	7.075	8.131	9.307	8.117	8.426 ***

(Continued)

Table 2. (Continued)

Analysts	2.404	0.544	2.079	2.485	2.833	2.392	2.429	***
IC_PAR	2.247	3.578	0.323	0.895	2.499	2.294	2.144	**

a. Variable Definitions

Agree: Equal to 1 if the sign of (revised forecast—the same analyst's previous forecast) is same with the sign of (management forecast—analyst's previous forecast) and 0 otherwise.

Revise: (The revised forecast—previous forecast of the same analyst for the same forecast period) deflated by stock price as of the end of the month prior to the forecast revision, then rank this value into deciles and divide the ranks by nine and subtract by 0.5.

Investor_R: The abnormal return over three trading days centered on the analyst forecast revision day. The abnormal return is calculated relative to matched size and book-to-market portfolios (Fama & French, 1993).

FrimSize: The market value of equity at the end of the month prior to the analyst revision.

BM: The book-to-market ratio at the end of the month prior to the revision.

A_Exp: The number of days since the analyst's first EPS forecast on IBES.

Numfirm: The number of firms that the analyst covers at the month-end prior to the analyst revision.

Broker: The number of analysts in the employing brokerage house at the month-end prior to the analyst revision.

Horizon: The number of days from the analyst revision day to that revision's forecast period end.

Agree_C: Equal to 1 if the sign of the value of (management disclosure—the value of pre-existing median consensus) and the sign of (revised consensus of analyst forecasts—pre-existing median consensus of analyst forecasts) are same, and 0 otherwise.

R_Repu: Equal to 1 if the average of management forecast accuracy $(=-|MFE|)$ in the last 3 years is less than or equal to the average analyst forecast accuracy $(=-|AFE|)$ in the same period, and 0 otherwise.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

IC_AR: The absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, **, *** indicate two-tailed significance levels at 0.10, 0.05, and 0.01 levels, respectively.

The sample includes observations from 1995–2010.

Table 3. Pearson correlations among variables used in the regression

Panel A: Variables used in the tests of hypothesis 1

	Agree	Revise	Investor_R	FrimSize	BM	A_Exp	Numfirm	Broker
Revise	-0.040 (<.0001)							
Investor_R	0.018 (<.0001)	0.108 (<.0001)						
FrimSize	-0.052 (<.0001)	0.145 (<.0001)	0.009 (<.0001)					
BM	0.019 (<.0001)	-0.188 (<.0001)	-0.022 (<.0001)	-0.300 (<.0001)				
A_Exp	0.009 (<.0001)	0.021 (<.0001)	0.008 (<.0001)	0.057 (<.0001)	0.023 (<.0001)			
Numfirm	0.008 (<.0001)	0.010 (<.0001)	0.008 (<.0001)	-0.003 (0.093)	0.029 (<.0001)	0.324 (<.0001)		
Broker	-0.016 (<.0001)	0.019 (<.0001)	0.004 (0.024)	0.165 (<.0001)	-0.020 (<.0001)	0.047 (<.0001)	0.138 (<.0001)	
Horizon	-0.075 (<.0001)	0.028 (<.0001)	0.042 (<.0001)	0.065 (<.0001)	-0.030 (<.0001)	0.019 (<.0001)	0.009 (<.0001)	0.013 (<.0001)

Panel B: Variables used in the tests of hypotheses 2 and 3

	Agree	R_Repu	IC_MG	IC_AR	Std_AAR	Mean_AAR	FrimSize	Analysts
R_Repu	-0.043 (<.0001)							
IC_MG	0.043 (<.0001)	-0.027 (0.001)						
IC_AR	0.020 (0.012)	-0.036 (<.0001)	0.416 (<.0001)					
Std_AAR	0.010 (0.196)	-0.029 (0.000)	0.397 (<.0001)	0.416 (<.0001)				

(Continued)

Table 3. (Continued)

Mean_AAR	0.007	−0.049	0.423	0.463	0.895			
	0.404	<.0001	<.0001	<.0001	<.0001			
FrimSize	−0.096	0.081	−0.116	−0.021	−0.067	−0.070		
	<.0001	<.0001	<.0001	0.011	<.0001	<.0001		
Analysts	−0.031	0.099	−0.071	0.014	−0.067	−0.039	0.594	
	0.000	<.0001	<.0001	0.079	<.0001	<.0001	<.0001	
IC_PAR	0.019	0.027	0.156	0.234	0.256	0.290	0.186	0.310
	0.017	0.001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001

a. Variable Definitions

Agree: Equal to 1 if the sign of (revised forecast—the same analyst's previous forecast) is same with the sign of (management forecast—analyst's previous forecast) and 0 otherwise.

Revise: (The revised forecast—previous forecast of the same analyst for the same forecast period) deflated by stock price as of the end of the month prior to the forecast revision, then rank this value into deciles and divide the ranks by nine and subtract by 0.5.

Investor_R: The abnormal return over three trading days centered on the analyst forecast revision day. The abnormal return is calculated relative to matched size and book-to-market portfolios (Fama & French, 1993).

FrimSize: The market value of equity at the end of the month prior to the analyst revision.

BM: The book-to-market ratio at the end of the month prior to the revision.

A_Exp: The number of days since the analyst's first EPS forecast on IBES.

Numfirm: The number of firms that the analyst covers at the month-end prior to the analyst revision.

Broker: The number of analysts in the employing brokerage house at the month-end prior to the analyst revision.

Horizon: The number of days from the analyst revision day to that revision's forecast period end.

Agree_C: Equal to 1 if the sign of the value of (management disclosure—the value of pre-existing median consensus—the value of pre-existing median consensus of analyst forecasts) and the sign of (revised consensus of analyst forecasts—pre-existing median consensus of analyst forecasts) are same, and 0 otherwise.

R_Repu: Equal to 1 if the average of management forecast accuracy (=—|MFE|) in the last 3 years is less than or equal to the average analyst forecast accuracy (=—|AFE|) in the same period, and 0 otherwise.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

IC_AR: The absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter following management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

highly correlated with each other; however, high correlations among control variables do not affect the estimation of the coefficient of interest.

4.2. The results of the tests of Hypothesis 1

Table 4 contains the regression results for investor reaction to analyst revisions conditional on the consistency between the information in management disclosure and the information in the subsequent analyst revisions. Panel A reports the results using all of the revisions sample, and Panel B shows the results using the sample that excludes all revisions that are issued on the day of the previous management disclosure to eliminate the influence of the overlapping window when calculating the investor reaction variable. Model 1 includes the main variables and firm-specific control variables. Models 2 and 3 also include the control variables for analyst-specific and revision-specific variables. For all panels and all models, the coefficients of the main variable, *Revise*Agree*, are significantly positive at the 1% level. This shows that investor reaction is significantly greater when the analyst revisions are consistent with the prior management disclosure. Thus, the robust results support Hypothesis 1. The effects of the control variables on investor reaction to analyst revisions are also consistent with prior studies. The firm size and book-to-market ratio are negatively associated with investor reaction to analyst revisions, which implies that investor reaction to analyst revisions is greater for smaller firms and high growth firms. For the analyst revisions that are released by analysts with a wider firm reach, investor reaction is weaker. For the revisions by analysts that are employed by larger brokerage houses, investor reaction is substantial.

4.3. The results for the tests of Hypothesis 2

Table 5 shows the regression results for the tests of Hypothesis 2. I estimate an alternative version of models 1, 2, and 3 according to the types of control variables that are included. Using different samples from the tests of Hypothesis 1, the results from all three of the models show a significantly negative relationship between *IC_MG*Agree_C* and *IC_AR*. Conditional on the positive association between *IC_MG* and *IC_AR*, this negative coefficient of the interaction variable implies that the relative information content of the inconsistent revisions is greater than that of the consistent revisions. The inconsistent revisions contain a greater amount of new information than the consistent revisions, which supports Hypothesis 2.

The coefficients of the return volatility variables are statistically significant, but the coefficient of *Std_AAR* is negative, which is inconsistent with the prediction. However, the result can be explained by the correlation results presented in Table 3 because the result can be caused by the high correlation between the *Std_AAR* and the *Mean_AAR* variables. I obtain significant results for the analyst coverage and the information content of analyst revisions in the weeks prior to the management disclosure; however, with respect to firm size, I find no significant effect on the analyst revision role for investors.

4.4. The results for the tests of Hypothesis 3

To examine Hypothesis 3, I estimate regressions using the inconsistent subsample only, and I use the interaction variable between the *IC_MG* and *R_Repu* variable as the main variable. In Panel A of Table 6, we find that the coefficients of the interaction variable *IC_MG*R_Repu* are positive and significant at the 5% level. The effect of the historical accuracy of analyst revisions with management disclosures on investor reaction is positive within the inconsistent revisions sample. This implies that the relative information content of the new information in the inconsistent sample is greater when the analyst revisions are historically more accurate than the management disclosures are. Therefore, the results support Hypothesis 3. The results for other variables are qualitatively consistent with the results in Table 5 using this model.

Table 4. Investor reactions to analyst forecast revisions conditional on the consistency between management disclosure and analyst revisions

Panel A: All revisions (Dependent variable = Investor_R)

	PredictedSign	Model 1			Model 2			Model 3		
		Est.	t stat		Est.	t stat		Est.	t stat	
Intercept		−0.049	−5.11	***	−0.047	−4.66	***	−0.062	−6.13	***
Revise	+	0.259	40.26	***	0.313	28.37	***	0.416	34.24	***
Revise*Agree	+	0.034	11.46	***	0.034	11.51	***	0.027	9.21	***
Revise*FrimSize	-	−0.022	−33.28	***	−0.022	−32.87	***	−0.021	−30.99	***
Revise*BM	-	−0.096	−26.30	***	−0.096	−26.08	***	−0.098	−26.76	***
Revise*A_Exp	+				−0.004	−3.65	***	−0.004	−3.22	***
Revise*Numfirm	-				−0.011	−4.59	***	−0.011	−4.44	***
Revise*Broker	+				0.002	2.71	***	0.002	2.59	***
Revise*Horizon	?							−0.022	−20.69	***
Agree		0.003	4.58	***	0.003	4.57	***	0.004	5.24	***
FrimSize		0.000	0.41		0.000	0.43		0.000	−0.44	
BM		0.005	3.53	***	0.005	3.57	***	0.006	4.24	***
A_Exp					−0.001	−2.05	**	−0.001	−2.04	**
Numfirm					0.001	1.47		0.001	1.54	
Broker					0.000	0.68		0.000	0.79	
Horizon								0.003	8.08	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		296,294			296,294			296,294		
R^2		0.1003			0.1005			0.1021		

Panel B: Non-overlapping windows (Dependent variable = Investor_R)

	PredictedSign	Model 1			Model 2			Model 3		
Intercept		−0.027	−5.44	***	−0.027	−5.14	***	−0.032	−5.99	***
Revise	+	0.144	40.75	***	0.145	24.03	***	0.185	27.68	***
Revise*Agree	+	0.021	12.58	***	0.021	12.62	***	0.018	11.00	***

(Continued)

Table 4. (Continued)

Revise*FrimSize	-	−0.012	−33.95	***	−0.013	−34.39	***	−0.012	−32.97	***
Revise*BM	-	−0.050	−25.02	***	−0.050	−25.13	***	−0.051	−25.59	***
Revise*A_Exp	+				0.000	0.15		0.000	0.48	
Revise*Numfirm	-				−0.004	−2.93	***	−0.004	−2.81	***
Revise*Broker	+				0.003	6.10	***	0.003	6.07	***
Revise*Horizon	?							−0.009	−14.25	***
Agree		0.002	3.82	***	0.002	3.82	***	0.002	4.28	***
FrimSize		0.000	0.86		0.000	0.96		0.000	0.32	
BM		0.000	0.42		0.000	0.42		0.001	0.87	
A_Exp					0.000	−1.02		0.000	−1.02	
Numfirm					0.000	1.13		0.000	1.14	
Broker					0.000	−0.09		0.000	−0.01	
Horizon								0.001	4.84	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		215,169			215,169			215,169		
Adjusted R^2		0.0830			0.0832			0.0843		

a. Variable Definitions

Investor_R: The abnormal return over three trading days centered on the analyst forecast revision day. The abnormal return is calculated relative to matched size and book-to-market portfolios (Fama & French, 1993).

Revise: (The revised forecast—previous forecast of the same analyst for the same forecast period) deflated by stock price as of the end of the month prior to the forecast revision, then rank this value into deciles and divide the ranks by nine and subtract by 0.5.

Agree: Equal to 1 if the sign of (revised forecast—the same analyst's previous forecast) is same with the sign of (management forecast—analyst's previous forecast) and 0 otherwise.

FrimSize: The market value of equity at the end of the month prior to the analyst revision.

BM: The book-to-market ratio at the end of the month prior to the revision.

A_Exp: The number of days since the analyst's first EPS forecast on IBES.

Numfirm: The number of firms that the analyst covers at the month-end prior to the analyst revision.

Broker: The number of analysts in the employing brokerage house at the month-end prior to the analyst revision.

Horizon: The number of days from the analyst revision day to that revision's forecast period end.

*, ** , and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

Table 5. The relative information contents of analyst revisions to the management forecasts conditional on the consistency (Dependent variable = IC_AR)

	Predicted Sign	Model 1		Model 2		Model 3	
		Est.	t stat	Est.	t stat	Est.	t stat
Intercept		0.013	0.73	-0.002	-0.13	0.006	0.33
IC_MG*Agree_C	-	-0.057	-3.03 ***	-0.056	-2.97 ***	-0.058	-3.09 ***
IC_MG	+	0.372	22.23 ***	0.375	22.43 ***	0.370	22.20 ***
Agree_C	?	0.005	3.28 ***	0.005	3.42 ***	0.005	3.33 ***
Return Volatility							
Std_AAR	+	-0.286	-4.42 ***	-0.285	-4.41 ***	-0.280	-4.35 ***
Mean_AAR	+	1.062	20.85 ***	1.065	20.93 ***	0.998	19.60 ***
Pre-disclosure information environment							
FrimSize	?			0.000	-0.41	0.000	-0.88
Analysts	?			0.006	5.75 ***	0.003	3.06 ***
IC_PAR	?					0.002	11.84 ***
Industry dummies		Included		Included		Included	
Year dummies		Included		Included		Included	
# of obs.		15,212		15,212		15,212	
R^2		0.2871		0.2896		0.2961	

a. Variable Definitions

IC_AR: The absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

Agree_C: Equal to 1 if the sign of the value of (management disclosure—the value of pre-existing median consensus) and the sign of (revised consensus of analyst forecasts—pre-existing median consensus of analyst forecasts) are same, and 0 otherwise.

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, **, and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

cogent · business & management

Table 6. The relative information contents of analyst revisions to the management forecasts in inconsistent subsample and the quality of new information (Dependent variable = IC_AR)

	Predicted Sign	Model 1			Model 2			Model 3		
		Est.	t stat		Est.	t stat		Est.	t stat	
Intercept		−0.062	−1.83	*	−0.074	−2.18	**	−0.066	−1.96	**
IC_MG*R_Repu	+	0.096	2.38	**	0.092	2.26	**	0.095	2.36	**
IC_MG	+	0.308	8.14	***	0.314	8.33	***	0.306	8.14	***
R_Repu	?	−0.005	−1.73	*	−0.005	−1.84	*	−0.006	−1.87	*
Return Volatility										
Std_AAR	+	−0.333	−3.01	***	−0.327	−2.97	***	−0.327	−2.98	***
Mean_AAR	+	1.074	12.37	***	1.071	12.37	***	1.015	11.71	***
Pre-disclosure information environment										
FrimSize	?				−0.001	−1.20		−0.001	−1.41	
Analysts	?				0.008	4.22	***	0.006	2.94	***
IC_PAR	?							0.001	6.40	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		4,712			4,712			4,712		
R^2		0.3203			0.3236			0.3295		

a. Variable Definitions

IC_AR: The absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

R_Repu: Equal to 1 if the average of management forecast accuracy (=−|MFE|) in the last 3 years is less than or equal to the average analyst forecast accuracy (=−|AFE|) in the same period, and 0 otherwise.

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, **, and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

cogent ·· business & management

5. Additional tests

5.1. Alternative tests with the sample using individual analyst revisions for Hypotheses 2 and 3

I use analyst forecast consensus data and measure the information content of analyst forecast revisions (*IC_AR*) using the sum of abnormal returns on each day with analyst revisions during the one-week period following management disclosure, consistent with prior studies (Francis et al., 2002; Chen et al., 2012). Because of the sample and measure, the samples for Hypotheses 2 and 3 are smaller than the sample used for Hypothesis 1. As an additional test, I re-examine Hypotheses 2 and 3 using individual analyst revision samples and a new measure for the information content of analyst revisions that are calculated as the absolute value of the abnormal returns on the day that the analyst revision is issued. Using these individual revisions results in some noise. For example, if there are two different analysts following the same firm, and both revise their earnings forecast on the same day following management disclosure, the result will be two different observations using individual revisions because the forecasts can be revised in opposite directions. However, the two observations have the same value for investor reaction to management disclosure and to analyst revision. Therefore, using these samples in this context results in a degree of hypotheses testing noise.

Tables 7 and 8 present the results for the tests of Hypotheses 2 and 3, respectively, using these alternative samples and a new dependent variable *IC_AR_I* that is measured as the absolute value of abnormal returns on the day that analyst revision is released. The results in Table 7 are similar to those reported in Table 5, despite the noise caused by the samples. The coefficients of the interaction variable *IC_MG*Agree* remain negative and significant at the 1% level, in all models, consistent with Hypothesis 2. However, Table 8 shows that the coefficients of the main variable, *IC_MG*R_Repu*, are not significant and have a negative value in Model 1. These results could be affected by the noise from the samples.

5.2. Alternative measures of relative historical accuracy between analyst revisions and management forecasts

To test Hypothesis 3 and to define the information quality of analyst revisions compared to the information quality of management forecasts, I use the *R_Repu* variable, which is equal to 1 if the average management forecast accuracy for the last three years is less than or equal to the average analyst forecast accuracy for the same period, and 0 otherwise. As a robustness check, I repeat the test using an alternative measure *R_Repu2* instead of *R_Repu*. *R_Repu2* is the average of the values of relative management forecast accuracy for the last three years, where the relative management forecast accuracy is equal to 1 if the management forecast accuracy is less than the analyst forecast accuracy, 0 if the management forecast accuracy equals the analyst forecast accuracy, and −1 otherwise. The results of the tests for Hypothesis 3 using the alternative measure are presented in Table 9. The results are similar to the results in Table 6. The coefficients of *IC_MG*R_Repu2* are also positive and significant at the 5% level, supporting Hypothesis 3.

5.3. The relative ex-post accuracy of analyst revisions (consistent versus inconsistent)

In the tests of Hypothesis 2, I find that the relative information content of the analyst revisions is greater when the information contained in the analyst revisions is inconsistent with prior management disclosure. This could be a result of new information possessed by analysts that is not released in the management disclosures. To investigate this issue, I conduct an additional univariate test to measure whether the inconsistent analyst revisions are actually more accurate than the consistent analyst revisions. I use the variable that is the relative ex-post accuracy of analyst revisions compared to management forecasts. The variable is equal to 1 if the ex-post accuracy of analyst revisions is more than or equal to the ex-post accuracy of the prior management forecast and 0 otherwise. Using this measure, the untabulated test results show that the mean of the relative ex-post accuracy of inconsistent analyst revisions is significantly higher than the mean of the relative ex-post accuracy of consistent analyst revisions. The results support the prediction

Table 7. Alternative tests with the sample using individual analyst revisions for H2 (Dependent variable = IC_AR_I)

	Predicted Sign	Model 1			Model 2			Model 3		
		Est.	t stat		Est.	t stat		Est.	t stat	
Intercept		0.017	2.24	**	0.046	5.98	***	0.048	6.26	***
IC_MG*Agree	-	−0.046	−4.10	***	−0.048	−4.30	***	−0.048	−4.26	***
IC_MG	+	0.312	29.41	***	0.299	28.34	***	0.293	27.78	***
Agree	?	0.007	8.58	***	0.007	8.22	***	0.007	8.14	***
Return Volatility										
Std_AAR	+	0.048	1.52		0.063	2.00	**	0.048	1.51	
Mean_AAR	+	0.525	21.88	***	0.517	21.69	***	0.478	19.91	***
Pre-disclosure information environment										
FrimSize	?				−0.004	−27.13	***	−0.004	−26.54	***
Analysts	?				−0.001	−5.25	***	−0.003	−9.73	***
IC_PAR	?							0.018	11.76	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		76,195			76,195			76,195		
R^2		0.1799			0.1904			0.1919		

a. Variable Definitions

IC_AR_I: The absolute value of abnormal returns on the day when analyst revision issued.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

Agree: Equal to 1 if the sign of (revised forecast—the same analyst's previous forecast) is same with the sign of (management forecast—analyst's previous forecast) and 0 otherwise.

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, **, and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

Table 8. Alternative tests with the sample using individual analyst revisions for H3 (Dependent variable = IC_AR_I)

	Predicted Sign	Model 1			Model 2			Model 3		
		Est.	t stat		Est.	t stat		Est.	t stat	
Intercept		−0.139	−3.03	***	−0.114	−2.49	**	−0.116	−2.53	**
IC_MG*R_Repu	+	−0.004	−0.20		0.001	0.06		0.004	0.20	
IC_MG	+	0.304	19.25	***	0.291	18.48	***	0.282	17.82	***
R_Repu	?	0.002	1.40		0.002	1.48		0.002	1.47	
Return Volatility										
Std_AAR	+	−0.122	−1.78	*	−0.111	−1.62		−0.121	−1.76	*
Mean_AAR	+	0.657	12.62	***	0.659	12.71	***	0.608	11.61	**
Pre-disclosure information environment										
FrimSize	?				−0.003	−7.83	***	−0.003	−7.54	***
Analysts	?				−0.001	−1.90	*	−0.003	−4.47	***
IC_PAR	?							0.023	6.71	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		12,031			12,031			12,031		
R^2		0.2406			0.2439			0.2467		

a. Variable Definitions

IC_AR_I: The absolute value of abnormal returns on the day when analyst revision issued.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

R_Repu: Equal to 1 if the average of management forecast accuracy (=−|MFE|) in the last 3 years is less than or equal to the average analyst forecast accuracy (=−|AFE|) in the same period, and 0 otherwise.

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, ** , and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

Table 9. Alternative measure of relative historical accuracy between analyst revision and management forecast (Dependent variable = IC_AR)

	Predicted Sign	Model 1 Est.	Model 1 t stat		Model 2 Est.	Model 2 t stat		Model 3 Est.	Model 3 t stat	
Intercept		-0.064	-1.89	*	-0.077	-2.26	**	-0.069	-2.05	**
IC_MG*R_Repu2	+	0.062	2.03	**	0.061	1.99	**	0.064	2.09	**
IC_MG	+	0.357	15.56	***	0.361	15.74	***	0.354	15.49	***
R_Repu2	?	-0.005	-2.28	**	-0.005	-2.41	**	-0.005	-2.38	**
Return Volatility										
Std_AAR	+	-0.330	-2.99	***	-0.324	-2.94	**	-0.324	-2.95	***
Mean_AAR	+	1.071	12.34	***	1.068	12.34	***	1.013	11.68	***
Pre-disclosure information environment										
FrimSize	?				-0.001	-1.08		-0.001	-1.30	
Analysts	?				0.008	4.25	***	0.006	2.97	***
IC_PAR	?							0.001	6.37	***
Industry dummies		Included			Included			Included		
Year dummies		Included			Included			Included		
# of obs.		4,712			4,712			4,712		
R^2		0.3203			0.3237			0.3296		

a. Variable Definitions

IC_AR: The absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure.

IC_MG: The absolute value of abnormal returns on the management disclosure announcement day.

R_Repu2: The average of relative management forecast accuracy in last 3 years. The relative management forecast accuracy is equal to 1 if the management forecast accuracy (=−|MFE|) is less than the analyst forecast accuracy (=−|AFE|), 0 if the management forecast accuracy equals to the analyst forecast accuracy, and −1 otherwise.

Std_AAR: The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure.

Mean_AAR: The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure.

Analysts: Log of total number of analyst forecasts used in consensus following management forecast.

IC_PAR: The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure.

*, **, and *** indicate two-tailed significance at 0.10, 0.05, and 0.01 levels, respectively.

that inconsistent revisions possess a higher likelihood of containing accurate information compared to management forecasts than consistent revisions. These results supplement the results from the tests of Hypothesis 2.

6. Conclusion

This study examines the relationship between the contents of the analyst revisions and the content of prior management disclosures and the effect on investor reaction to the analyst revisions. Prior studies concerning investor reaction to analyst revisions have examined only the effect of the timing of analyst forecast revision information with respect to management disclosures. Investors, however, consider these two types of information simultaneously, and the relationship between the contents of the two information events should be considered in addition to the sequence of timing. Using the consistency as one aspect of the relationship between the contents of management disclosure and analyst revisions, I find that the consistency of analyst revisions with management disclosure positively affects investor reaction to analyst revisions. Additionally, I demonstrate that inconsistent analyst revisions contain a greater amount of new information than consistent analyst revisions. Moreover, I find that the quality of analyst revision information increases investor reaction to analyst revisions following management forecasts.

This study provides a new perspective on the analysis of investor reaction to analyst research. My findings are consistent with the conjecture that investors simultaneously consider firm characteristics, analyst characteristics, the timing sequence, and the contents of analyst information. These findings give the implications to enterprisers that they should be more careful about disclosing their earnings forecast. Moreover, this study extends the literature concerning financial analysts; however, it also has limitations. Future studies should explore why analysts issue inconsistent revisions and how these revisions affect the information content of analyst revisions and management forecasts.

Author details
Kyunbeom Jeong
E-mail: kbjeong@hansung.ac.kr
School of Business Administration, Hansung University, 116, Samseongyo-ro 16-gil, Seongbuk-gu, Seoul 02876, Korea.

Citation information
Cite this article as: Investor use of revised analyst information following management disclosures, Kyunbeom Jeong, *Cogent Business & Management* (2020), 7: 1757843.

Notes
1. Because the term information discovery role is typically used in the case of information that is disclosed prior to other information, the term new information role may be more appropriate for cases where analyst revisions follow management disclosures. I use these two terms interchangeably.
2. Due to data insufficiency prior to 1995, I set my sample period from the year 1995 to 2010.
3. Chen et al. (2010) used this model and the information content of analyst research measured as the absolute value of the sum of the signed abnormal returns on all the days with analyst research in the week following the earnings announcement. Thus, each earnings announcement provides a maximum of one observation. Similarly, this study uses one observation for every management forecast.

4. To eliminate outlier problems, I truncate the top and bottom 1% of all of the continuous variables.

References
Abarbanell, J, Lanen, W, & Verrecchia, R. (1995). Analysts' forecasts as proxies for investor beliefs in empirical research. *Journal Of Accounting and Economics*, *20* (1), 31–60. doi: doi.https://doi.org/10.1016/0165-4101(94)00392-I
Chen, X., Cheng, Q., & Lo, K. (2010). On the relationship between analyst reports and corporate disclosures: Exploring the roles of information discovery and interpretation. *Journal of Accounting and Economics*, *49*(3), 206–226. https://doi.org/10.1016/j.jacceco.2009.12.004
Cooper, R. A., Day, T. E., & Lewis, C. M. (2001). Following the leader: A study of individual analysts' earnings forecasts. *Journal of Financial Economics*, *61*(3), 383–416. https://doi.org/10.1016/S0304-405X(01)00067-8
Dempsey, S. (1989). Predisclosure information search incentives, analyst following, and earnings announcement price response. *The Accounting Review*, *64*(4), 748–757. https://www.jstor.org/stable/247859
Demski, J. S., & Feltham, G. A. (1994). Market response to financial reports. *Journal of Accounting and Economics*, *17*(1–2), 3–40. https://doi.org/10.1016/0165-4101(94)90003-5
Elgers, P., Lo, M., & Pfeiffer, R., Jr. (2001). Delayed security price adjustments to financial analysts' forecasts of annual earnings. *The Accounting Review*, *76*(4), 613–632. https://doi.org/10.2308/accr.2001.76.4.613

Fama, E., & French, K. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3–56. https://doi.org/10.1016/0304-405X(93)90023-5

Francis, J., Schipper, K., & Vincent, L. (2002). Earnings announcements and competing information. *Journal of Accounting and Economics*, 33(3), 313–342. https://doi.org/10.1016/S0165-4101(02)00058-7

Frankel, R., Kothari, S. P., & Weber, J. P. (2006). Determinants of the informativeness of analyst research. *Journal of Accounting and Economics*, 41 (1–2), 29–54. https://doi.org/10.1016/j.jacceco.2005.10.004

Gleason, C., & Lee, C. (2003). Analyst forecast revisions and market price discovery. *The Accounting Review*, 78(1), 193–225. https://doi.org/10.2308/accr.2003.78.1.193

Holthausen, R. W., & Verrecchia, R. E. (1988). The effect of sequential information release on the variation of price changes in an intertemporal multi-asset market. *Journal of Accounting Research*, 26(1), 82–106. https://doi.org/10.2307/2491114

Ivkovic´, Z., & Jegadeesh, N. (2004). The timing and value of forecast and recommendation revisions. *Journal of Financial Economics*, 73(3), 433–463. https://doi.org/10.1016/j.jfineco.2004.03.002

Kim, O., & Verrecchia, R. E. (1994). Market liquidity and volume around earnings announcements. *Journal of Accounting and Economics*, 17(1–2), 41–67. https://doi.org/10.1016/0165-4101(94)90004-3

Livnat, J., & Zhang, Y. (2012). Information interpretation or information discovery: Which role of analysts do investors value more? *Review of Accounting Studies*, 17(3), 612–641. https://doi.org/10.1007/s11142-012-9193-8

Park, C., & Stice, E. (2000). Analyst forecasting ability and the stock price reaction to forecast revisions. *Review of Accounting Studies*, 5(3), 259–272. https://doi.org/10.1023/A:1009668711298

Ramnath, S., Rock, S., & Shane, P. (2008). Financial analyst forecasting literature: A taxonomy with trends and suggestions for further research. *International Journal of Forecasting*, 24(1), 34–75. https://doi.org/10.1016/j.ijforecast.2007.12.006

Shores, D. (1990). The association between interim information and security returns around earnings announcements. *Journal of Accounting Research*, 28 (1), 164–181. https://doi.org/10.2307/2491221

Stickel, S. (1992). Reputation and performance among security analysts. *Journal of Finance*, 47(5), 1811–1836. https://doi.org/10.1111/j.1540-6261.1992.tb04684.x

Appendix 1. Variable Definitions

Variable name	Definition
Agree	Equal to 1 if the sign of (revised forecast minus the same analyst's previous forecast) is same with the sign of (management forecast minus analyst's previous forecast) and 0 otherwise
Revise	The revised forecast minus previous forecast of the same analyst for the same forecast period deflated by stock price as of the end of the month prior to the forecast revision, then rank this value into deciles and then divide the ranks by nine and subtract by 0.5
Investor_R	The abnormal return over three trading days centered on the analyst forecast revision day. The abnormal return is calculated relative to matched size and book-to-market portfolios (Fama & French, 1993)
R_Repu	Equal to 1 if the average of management forecast accuracy (=—|MFE|) in the last 3 years is less than or equal to the average analyst forecast accuracy (=—|AFE|) in the same period, and 0 otherwise
FrimSize	The market value of equity at the end of the month prior to the analyst revision
BM	The book-to-market ratio at the end of the month prior to the revision
A_Exp	The number of days since the analyst's first EPS forecast on IBES
Numfirm	The number of firms that the analyst covers at the month-end prior to the analyst revision
Broker	The number of analysts in the employing brokerage house at the month-end prior to the analyst revision
Horizon	The number of days from the analyst revision day to that revision's forecast period end
Agree_C	Equal to 1 if the sign of the value of (management disclosure minus the value of pre-existing median consensus) and the sign of (revised consensus of analyst forecasts minus pre-existing median consensus of analyst forecasts) are same, and 0 otherwise.
IC_MG	The absolute value of abnormal returns on the management disclosure announcement day
IC_AR	The information contents of analyst revisions in one week period after the management disclosure, which is calculated as the absolute value of the sum of the signed abnormal returns on all the analyst revisions issued within one week after management disclosure
Std_AAR	The standard deviation of the absolute value of daily abnormal returns in the quarter around management disclosure
Mean_AAR	The mean of the absolute value of daily abnormal returns in the quarter around the management disclosure
Analysts	Log of total number of analyst forecasts used in consensus following management forecast
IC_PAR	The sum of the abnormal returns on each day with analyst research for each of the 6 weeks prior to management disclosure

Cogent Business & Management (ISSN: 2331-1975) is published by Cogent OA, part of Taylor & Francis Group.

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com