

Motivational and Cognitive Determinants of Buy-Side and Sell-Side Analyst Earnings Forecasts: An Experimental Study

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This paper provides experimental evidence about the differences between buy-side analyst (BSA) and sell-side analyst (SSA) earnings forecasts, and investigates both motivational and cognitive determinants of these differences. Regarding motivational determinants, we argue that the SSA work environment contains greater incentives for optimistic forecasts than does the BSA work environment. Regarding cognitive determinants, we examine whether three characteristics of the information on which analysts base their forecasts (trend, variability, and recency) contribute to optimism. We also examine whether forecasts are more optimistic over longer forecast horizons. Results indicate that, as expected, SSAs make more favorable earnings forecast revisions than BSAs, and, consistent with prior research, analyst forecasts are greater as forecast horizon increases. In addition, while information variability does not contribute to optimism, differences in trend and recency do. Specifically, analysts act as if they discount both past earnings information with a decreasing trend and negative recent information when revising their forecasts. Directions for additional research on motivational and cognitive determinants of analyst forecasts are offered.

Introduction

Many studies have documented optimism in sell-side analyst (SSA) earnings forecasts (e.g., Dechow, Hutton, and Sloan [2000], Easterwood and Nutt [1999], Beneish [1991], Biddle and Ricks [1988], Critchfield, Dyckman, and Lakonishok [1978], Stickel [1992], Abarbanell [1991], Ali, Klein, and Rosenfeld [1992], Das, Levine, and Sivaramakrishnan [1998], Bathke, Hassell, and Lukawitz [1991], Dreman and Berry [1995], Dugar and Nathan [1995], Fried and Givoly [1982], Klein [1990], O'Brien [1988]). Only one study we are aware of (Willis [2001]) has found that buy-side analyst (BSA) earnings forecasts are also optimistic.¹

However, no research has examined the *differences* between BSA and SSA earnings forecasts. Some studies have examined motivational and (to a lesser extent) cognitive determinants of SSA optimism, but no study has examined whether both factors jointly contribute to analyst optimism. This paper examines those differences, and considers both motivational and cognitive determinants.

The motivational determinants of SSA optimism derive from their institutional environment, which contains incentives to be optimistic (Francis and Philbrick [1993], Lin and McNichols [1998], Dugar and Nathan [1995], Hayes [1998]). Specifically, SSAs have incentives to cultivate management relationships (Francis and Philbrick [1993]), support investment banking and underwriting activities (Lin and McNichols [1998], Dugar and Nathan [1995]), and generate trading commissions (Hayes [1998]). The BSA institutional environment, on the other hand, does not contain such incentives (Fogarty and Rogers [2005], Jegadeesh et al. [2004]). Given these institutional differences, we expect SSAs to make more optimistic earnings forecasts than BSAs.

The cognitive determinants of SSA optimism derive from information processing biases that can lead analysts to underreact to negative earnings information and overreact to recent earnings changes (e.g., DeBondt and Thaler [1990], Easterwood and Nutt [1999]). In addition, research has documented a positive relationship between SSA optimism and the variability of both earnings forecasts and forecast errors (DeBondt and Forbes [1999], Das, Levine, and Sivaramakrishnan [1998], Huberts and Fuller [1995]).

We examine whether prior earnings information that differs in trend (increasing, decreasing), recency (positive, negative), and variability (high, low) influences optimism, and whether forecasts are more optimistic over longer forecast horizons. We focus on these information characteristics because prior research suggests

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they are relevant to analyst optimism. In addition, we examine whether SSAs and BSAs are influenced *differentially* by these characteristics.

We test our hypotheses in an experiment in which 101 BSAs and 70 SSAs were asked to predict earnings per share (EPS) for current-year, one-year-ahead, and two-year-ahead horizons and make a stock recommendation for eight fictitious companies. We developed the eight companies by manipulating a six-year prior EPS series for each company so that it differs in terms of increasing or decreasing trend, negative or positive recent changes, and high or low variability.

We find support for both motivational and cognitive determinants of optimism. Specifically, as we expect, SSAs make more favorable earnings forecasts than BSAs. Also as we expect, we find that analysts 1) discount prior earnings information with a decreasing trend, 2) display recency effects, but less so for negative than for positive information, and 3) make more favorable forecasts over longer horizons. However, the variability of information does not contribute to the favorableness of their earnings forecasts, nor do BSAs and SSAs differ in their reactions to trend, recency, or variability.

This study makes three contributions. First, it provides evidence of differences in earnings forecast revisions by SSAs and BSAs based on the same information. Prior research has identified differences in the information used by SSAs and BSAs (Williams, Moyes, and Park [1996]), but has not examined whether both groups use the same information differently in their earnings forecasts.

Second, we provide evidence that both motivational and cognitive determinants of analyst optimism are valid by examining both types jointly. Earlier studies examined motivational and cognitive determinants independently.

Third, unlike most studies examining analyst optimism, we use an experimental approach. This has the potential to both confirm the results of capital markets research, and to provide new hypotheses for investigation.

The paper is organized as follows. The second section describes research on motivational and cognitive determinants of analyst optimism, and develops our hypotheses in the context of prior research. The third section describes the experimental design and method. The fourth section gives our results, and the fifth section presents conclusions and suggestions for future research.

Background and Development of Hypotheses

Research shows SSAs overestimate future earnings and their optimism is more prevalent in the face of

bad news (e.g., Bathke, Hassell, and Lukawitz [1991], Dreman and Berry [1995], Fried and Givoly [1982], Klein [1990], O'Brien [1988]).² Willis [2001] is the only study we are aware of that examines BSA optimism. He finds evidence of even greater optimism in BSA forecasts than in SSA forecasts.³ As noted earlier, both motivational and cognitive determinants of optimism have been proposed.

Motivational Determinants of Optimism

Motivational determinants of SSA optimism focus on incentives to produce optimistic earnings forecasts in order to 1) access managers' private information (Francis and Philbrick [1993]), 2) increase their performance evaluation and/or compensation (Dorfman [1991], Francis and Philbrick [1993]), and 3) enhance firm revenue via trading commissions (Schipper [1991], Hayes [1998]). Firms offering both underwriting services and analyst research may place additional pressure on SSAs because favorable forecasts help generate demand for the securities being underwritten and maintain long-term business relationships (Dugar and Nathan [1995], Lin and McNichols [1998], Schipper [1991]).

Hunton and McEwen [1997] provide experimental evidence that such incentives intensify the tendency of SSAs to make optimistic forecasts, and several studies have provided supporting empirical evidence (e.g., Dugar and Nathan [1995], Francis and Philbrick [1993], Lin and McNichols [1998]). Specifically, the evidence has found SSA earnings forecasts are optimistic even when their firms do not provide security underwriting or investment banking services (Doran, Smaby, and Fazel [1995], Francis and Philbrick [1993]). And they tend to be even more optimistic when such services are provided (Dugar and Nathan [1995]), and when trying to repair relationships with management following sell recommendations (Francis and Philbrick [1993]).

Of course, SSAs have incentives to be accurate as well as optimistic because their forecasts are publicly disclosed and they may not want their "mistakes" publicized. Thus, their incentives to be accurate and their incentives to be optimistic are not mutually exclusive (Dugar and Nathan [1995]).

BSAs also have incentives to be accurate because of their role in advising institutions about appropriate investments. Interestingly, Willis [2001] finds that BSAs may also have incentives to be optimistic—e.g., to increase short-run fund returns—even though they do not provide underwriting or investment banking services. In addition, optimism in SSA forecasts may be "passed on" to BSAs because BSAs use SSA forecasts when making their own forecasts (Schipper [1991], Williams, Moyes, and Park [1996], SRI International [1987]).

We suggest that while analysts may have incentives to be both accurate and optimistic, the relative strength of these incentives influences their forecast revisions. We argue that the SSA institutional environment contains stronger incentives to be optimistic, while the BSA institutional environment contains stronger incentives to be accurate, leading SSAs to make more favorable forecast revisions than BSAs. Consistent with prior research (DeBondt and Forbes [1999]), we examine optimism using analyst forecast revisions defined as their current-year forecast less the prior-year's actual or forecasted earnings. The following hypothesis results:

- H1: SSA forecast revisions will be more favorable than those of BSAs.

Cognitive Determinants of Optimism

Cognitive determinants of SSA optimism focus on information processing biases that can lead them to underreact to negative earnings information and overreact to recent earnings changes (Easterwood and Nutt [1999], Abarbanell and Bernard [1992], DeBondt and Thaler [1990], Klein [1990], Daniel, Hirshleifer, and Subrahmanyam [1998], and see Brown [1993] for a review). Moreover, the structure of the information on which analysts base their revisions can contribute to their optimism (Sedor [2002]). Research has shown that both SSAs and student subjects exhibit optimism, while a time series model of earnings does not (Affleck-Graves, Davis, and Mendenhall [1990]).

SSA optimism tends to increase when the information analysts receive is structured to facilitate "scenario thinking" (Sedor [2002]).⁴ Consistent with both cognitive and motivational explanations for optimism, Whitecotton [1996] finds that SSAs and student subjects both exhibit optimism, but SSAs tend to be more optimistic overall.

Trend. Research has documented an asymmetric relationship between negative and positive information and SSA optimism. Easterwood and Nutt [1999], for example, suggest that SSAs interpret all prior earnings information optimistically, and they show that SSAs underreact to prior losses and overreact to prior profits. Furthermore, many studies have found that SSA optimism is most prevalent in the face of negative information, such as poor earnings or price performance (see Dreman and Berry [1995], Easterwood and Nutt [1999], Butler and Saraoglu [1999], Ali, Klein, and Rosenfeld [1992], Amir and Ganzach [1998], Bauman and Downen [1994], Elgers and Lo [1994], Klein [1990], and Moses [1990]).

In addition, as Amir and Ganzach [1998] note, SSAs are more optimistic when making negative forecast revisions than when making positive forecast revisions. Other studies have found they are more likely to over-

estimate earnings following negative securities returns than to underestimate earnings following positive securities returns (see Abarbanell [1991], Hassell, Jennings, and Lasser [1988], and Klein [1990]).

Similar asymmetric effects of positive and negative information have been documented by psychology research. Specifically, individuals are more likely to predict desirable events than undesirable events (Babad [1995], Babad and Katz [1991], Babad, Hills, and O'Driscoll [1992], Budescu and Bruderman [1995], Byram [1997]), and they require less information to do so (Morlock [1967]).

Consistent with research in both accounting and psychology, we hypothesize that analyst evaluations of negative information contribute to their optimism. We operationalize negative information as decreasing earnings trends over the past six years. This is consistent with research showing analysts tend to underreact to negative information, defined as poor past earnings performance (Ali, Klein, and Rosenfeld [1992], Abarbanell and Bernard [1992], Daniel, Hirshleifer, and Subrahmanyam [1998]). We hypothesize that analysts will tend to discount prior earnings information with a decreasing trend, leading to more favorable forecast revisions for companies with decreasing earnings trends.

- H2: Analyst forecast revisions for companies with decreasing earnings trends will be more favorable than those for companies with increasing earnings trends

Recency. Research has documented that judgment is affected by the order in which information is presented. Experimental research in various settings and with experts including SSAs finds that judgments are unduly influenced by information presented later (more recently) in a series (e.g., Ashton and Ashton [1988], Ashton and Kennedy [2002], Hunton and McEwen [1997]). In addition, empirical research suggests that SSAs overreact to recent earnings changes (DeBondt and Thaler [1990]).

In this study, we operationalize recent negative (positive) information as a decrease (increase) in the most recent EPS over that of the previous year. Consistent with research indicating an asymmetric relationship between analyst optimism in the face of positive versus negative information (e.g., Dreman and Berry [1995], Easterwood and Nutt [1999], Butler and Saraoglu [1999], Ali, Klein, and Rosenfeld [1992], Amir and Ganzach [1998], Bauman and Downen [1994], Elgers and Lo [1994], Klein [1990], and Moses [1990]), we hypothesize that more recent negative information will lead to more favorable forecast revisions than more recent positive information.⁵

- H3: Analyst forecast revisions following recent negative information will be more favorable than those following recent positive information.

Variability. A positive relationship has been documented between uncertainty and extremity in predictions (Peterson and Pitz [1986]), as well as between uncertainty and judgments biased toward desirable outcomes (e.g., Harvey [1995], Sears [1983], Weinstein [1980]). Regarding earnings forecasts in particular, a positive relationship has been documented between SSA optimism and uncertainty, defined in terms of the variability of both earnings forecasts and forecast errors (DeBondt and Forbes [1999], Das, Levine, and Sivaramakrishnan [1998], Huberts and Fuller [1995], Beckers, Stelarios, and Thomson [2004], Ackert and Athanassakos [1997], Maines and Hand [1996]). Consistent with this research, we suggest that increased variability of past earnings increases the uncertainty of forecasting future earnings. We posit this will lead analysts to make more favorable forecast revisions for companies with more variable past earnings than for companies with less variable past earnings:

- H4: Analyst forecast revisions will be more favorable when past earnings are more variable than when they are less variable.

Forecast Horizon. A positive relationship has been documented between SSA optimism and forecast horizon (Ackert and Athanassakos [1997], DeBondt and Thaler [1990], Ali, Klein, and Rosenfeld [1992], Amir and Ganzach [1998], Hussain [1996]). Specifically, DeBondt and Thaler [1990] find that optimism is greater for two-year forecasts than for single-year forecasts, while Ackert and Athanassakos [1997], Amir and Ganzach [1998], and Ali, Klein, and Rosenfeld [1992] find that optimism increases over nineteen-, eleven-, and eight-month horizons, respectively.

In addition, some evidence indicates optimism in SSA quarterly earnings forecasts has declined over the past two decades (e.g., Brown [1997], Matsumoto [2002]). These results are consistent with research documenting a positive relationship between uncertainty and prediction extremity, and between uncertainty and judgments biased toward desirable outcomes (e.g., Harvey [1995], Sears [1983], Weinstein [1980]). This is because increased uncertainty is associated with longer forecast horizons. Thus, we hypothesize that analysts will make more favorable forecast revisions for longer forecast horizons (one- and two-year-ahead) than for shorter horizons (current-year):

- H5: Analyst forecast revisions will be more favorable as the forecast horizon increases.

Interactions Between Motivational and Cognitive Determinants

To obtain information on the potential interaction between motivational and cognitive determinants of optimism, we examine them jointly. We are aware of no theoretical or empirical research that bears directly

on this interaction. However, we reason that the greater institutional incentives SSAs have to be optimistic may exacerbate any cognitive tendency toward optimism. Thus, we hypothesize that the difference between SSA and BSA forecast revisions (H1) will be even greater for companies with decreasing earnings trends than for companies with increasing earnings trends, and for companies with recent negative information than for companies with recent positive information.

- H6: The difference between SSA and BSA forecast revisions will be greater for companies with decreasing earnings trends than for companies with increasing earnings trends.

- H7: The difference between SSA and BSA forecast revisions will be greater for companies with negative recent information than for companies with positive recent information.

Finally, we hypothesize that uncertainty offers an enhanced “opportunity” for SSAs to succumb to their incentives to be optimistic and thereby make more favorable forecasts than BSAs. In this way, SSA institutional incentives may contribute to more favorable forecast revisions (relative to BSAs) for companies with more variable past earnings than for companies with less variable past earnings, and for forecasts over longer horizons.

- H8: The difference between SSA and BSA forecast revisions will be greater for companies with more variable past earnings than for companies with less variable past earnings.

- H9: The difference between SSA and BSA forecast revisions will be greater as the forecast horizon increases.

In summary, we pose nine hypotheses that fall into three categories. The central hypothesis (H1) is based on motivational considerations and maintains that SSAs will make more favorable forecast revisions than BSAs. Four additional hypotheses (H2–H5) are based on cognitive considerations, and maintain that the favorableness of analyst forecast revisions will be influenced by the trend, recency, and variability characteristics of the information on which the forecasts are based, as well as by the length of the forecast horizon. Finally, a set of “interaction hypotheses” (H6–H9), which are admittedly more speculative, explore whether the forecast revisions of SSAs and BSAs will be influenced *differentially* by trend, recency, variability, and horizon.

Method

We tested our hypotheses in an experiment involving a 2×2^3 design, with analyst type (BSA, SSA) as a between-subjects variable and past earnings trend

(increasing, decreasing), recency direction (positive, negative), and variability (high, low) as within-subject variables. The dependent variables were EPS forecasts for the current year and for one- and two-year-ahead horizons.⁶

Participants

70 SSAs and 101 BSAs participated. Their mean level of experience as financial analysts was 11.2 years, and did not differ significantly between the two groups. The analysts were highly educated: 76% held master's degrees, 19% held undergraduate degrees, and 5% held doctorate degrees. 49% of the analysts worked for a national firm, 24% worked for a local firm, and 23% worked for a regional firm.⁷ We selected the analysts from the Association for Investment Management and Research (AIMR) Membership Directory, and from the Alumni Directory of Duke University's Fuqua School of Business. Their participation was elicited via mailed questionnaires. The materials were distributed to 1,300 AIMR equity analysts and 200 analysts from Fuqua's alumni directory, resulting in a response rate of 11.4%.

Procedure

Participants were asked to read the instructions that contained background information about the companies. They were told that fourteen companies had been randomly selected from the chemical industry, of which half had decreasing earnings trends and half had increasing earnings trends over the most recent six-year period. The instructions stated that each company was of moderate size, with both assets and annual gross sales between \$100 and \$250 million, and that each company had a low stock beta (suggesting its stock is relatively insensitive to general market movements). A brief description of the chemical industry was provided, based on our review of composite industry data for basic, diversified, and specialty chemicals.

We gave the participants a six-year EPS series for each of the fourteen fictitious companies and the average annual EPS for all companies in the chemical

industry to use as a benchmark. We asked them to predict EPS for the current year and for each of the two following years.

Eight of the fourteen companies were developed by manipulating the six-year EPS series.⁸ Table 1 shows all eight EPS series used. Specifically, we manipulated earnings trend, trend variability, and recency direction by giving participants EPS series with increasing/decreasing trends, high/low variability, and positive/negative recency, respectively. In the increasing trend condition, the sixth-year EPS was approximately 225% of the first-year EPS, while in the decreasing trend condition, the first-year EPS was approximately 225% of the sixth-year EPS. The increase and decrease patterns of both series were similar.

In the high variability condition, the variance of the six-year EPS series was three times that of the low variability condition. In the positive recency condition, the change in EPS in the final two years (i.e., the most recent change provided) was positive, while it was negative in the negative recency condition.

Finally, participants answered a brief post-experiment questionnaire concerning analyst incentives to issue favorable and accurate forecasts, as well as questions about their educational and professional backgrounds.

Results

Manipulation Checks

We included manipulation checks to shed light on the assumptions we made about the incentives in SSA and BSA work environments. Participants were asked to indicate on a seven-point scale how important it was to them to make accurate forecasts, and how important it was to make favorable forecasts. As expected, SSAs indicated it was more important to make favorable forecasts than BSAs ($t = 2.68$, $p < 0.01$; means = 3.21 and 2.50, respectively). The importance of favorable forecasts was positively correlated with one- and two-year-ahead forecasts ($r = 0.181$ and 0.176 ,

Table 1. *Past Earnings-Per-Share Series for the Eight Companies*

Experimental Conditions			Earnings Per Share					
Trend	Recency	Variability	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Increasing	Positive	High	\$1.79	\$4.90	\$5.76	\$1.22	\$2.66	\$4.07
Increasing	Positive	Low	\$1.79	\$3.91	\$4.04	\$2.17	\$3.08	\$4.06
Increasing	Negative	High	\$1.07	\$5.11	\$3.69	\$5.97	\$3.78	\$2.44
Increasing	Negative	Low	\$1.57	\$2.43	\$2.97	\$4.11	\$4.57	\$3.56
Decreasing	Positive	High	\$5.78	\$1.24	\$0.57	\$1.20	\$1.22	\$2.56
Decreasing	Positive	Low	\$2.93	\$1.37	\$2.99	\$1.83	\$0.30	\$1.29
Decreasing	Negative	High	\$4.67	\$0.03	\$0.09	\$2.55	\$3.47	\$2.04
Decreasing	Negative	Low	\$2.43	\$1.77	\$1.53	\$3.96	\$2.14	\$1.08
Industry Average EPS			\$2.43	\$2.67	\$2.86	\$2.79	\$2.81	\$2.65

respectively; $p = 0.02$ and 0.024 , respectively), consistent with motivational explanations for SSA forecasts (Dugar and Nathan [1995], Lin and McNichols [1998]). However, it was not correlated with current-year forecasts or forecast revisions.

Unexpectedly, SSAs also indicated it was more important to make accurate forecasts than BSAs ($t = 3.28$; $p = 0.001$; means = 4.73 and 3.86, respectively). This may be because SSA forecasts are disclosed publicly (while BSA forecasts are not), which may lead to a reluctance to have “mistakes” become public knowledge. This result supports the notion that institutional incentives to be accurate *and* optimistic are not mutually exclusive, and that analysts may value accuracy regardless of the incentives to be optimistic. The importance of accurate forecasts was positively correlated with two-year-ahead forecasts ($r = 0.137$, $p = 0.078$), but not with current-year or one-year-ahead forecasts or revisions.

Tests of Hypotheses

Although we collected participant forecasts for the current year, one year ahead, and two years ahead, for brevity's sake we present results only for current-year forecasts (the results for the other two years are generally similar). Table 2 gives the means (standard deviations) of the analyst forecasts (Panel A) and forecast revisions (Panel B) averaged over all eight companies. Table 3 gives their current-year forecasts and forecast revisions in each experimental condition (trend, recency, and variability). We test the hypotheses using the ANOVA shown in Table 4.

Recall that we have three sets of hypotheses. H1, our central hypothesis, reflects the expected motivational differences between the institutional environments/incentives of SSAs and BSAs. H2–H5 focus on cognitive determinants of forecast revisions suggested

by empirical research, and H6–H9 concern interactions between analyst type (BSA, SSA) and the four cognitive determinants from H2–H5.

H1 maintains that SSAs will make more favorable forecast revisions than BSAs, consistent with motivational explanations for optimism. Our results strongly support H1. SSAs' mean forecast revision is \$0.38, compared to \$0.18 for BSAs ($F = 10.21$, $p = 0.002$).

H2 maintains that analyst forecast revisions for companies with decreasing earnings trends will be more favorable than those for companies with increasing earnings trends. The results are strongly supportive: The mean revision for companies with decreasing trends is \$0.45; for companies with increasing trends it is \$0.07 ($F = 49.75$, $p < 0.001$). These results are consistent with the idea that analysts discount negative information.

H3 maintains that analyst forecast revisions following recent negative information will be more favorable than those following recent positive information. The results are again supportive. The mean forecast revision for companies with negative recent information is \$0.54; for companies with positive recent information it is $-\$0.02$ ($F = 78.64$, $p < 0.001$). This is again consistent with the idea that analysts discount negative information.

H4 maintains that analyst forecast revisions will be more favorable when past earnings are more variable than when they are less variable. Contrary to H4, the results indicate no difference in the mean forecast revision for high-variability (\$0.25) and low-variability (\$0.28) companies. Thus H1–H3 are supported; H4 is not.

H5 maintains that analyst forecast revisions will be more favorable as the forecast horizon increases. To test this, we conducted an ANOVA similar to the one in Table 4, but including forecast horizon as an additional within-subject variable. Using analyst raw forecasts

Table 2. Analyst Raw Forecasts and Forecast Revisions for the Eight Companies

	Current Year			One-Year Ahead			Two-Year Ahead		
	BSAs	SSAs	All	BSAs	SSAs	All	BSAs	SSAs	All
Panel A. Raw Forecasts									
Mean	\$2.81	\$3.02	\$2.90	\$2.93	\$3.18	\$3.04	\$3.03	\$3.32	\$3.15
SD	.46	.33	.43	.50	.42	.48	.59	.62	.62
N	97	69	166	96	69	165	97	69	166
	Current Year ¹			One-Year Ahead ²			Two-Year Ahead ³		
	BSAs	SSAs	All	BSAs	SSAs	All	BSAs	SSAs	All
Panel B. Forecast Revisions									
Mean	.18	.38	.26	.12	.16	.13	.10	.14	.12
SD	.46	.33	.43	.36	.34	.35	.52	.41	.48
N	97	69	166	96	69	165	96	69	165

¹(Current-Year Forecast – Year 6 EPS).

²(One-Year-Ahead Forecast – Current-Year Forecast).

³(Two-Year-Ahead Forecast – One-Year-Ahead Forecast).

Table 3. Analyst Current-Year Raw Forecasts and Forecast Revisions in Each Experimental Condition

	Raw Forecasts for Current Year			Forecast Revisions for Current Year		
	BSAs	SSAs	All	BSAs	SSAs	All
Decreasing Trend						
Mean	\$2.08	\$2.36	\$2.20	\$0.34	\$0.62	\$0.45
SD	(0.49)	(0.41)	(0.48)	(0.49)	(0.41)	(0.48)
N	98	70	168	98	70	168
Increasing Trend						
Mean	3.55	3.69	3.61	0.02	0.16	0.07
SD	(0.70)	(0.45)	(0.61)	(0.70)	(0.45)	(0.61)
N	100	69	169	100	69	169
Negative Recency						
Mean	2.73	2.95	2.82	0.45	0.67	0.54
SD	(0.63)	(0.40)	(0.56)	(0.63)	(0.40)	(0.56)
N	99	69	168	99	69	168
Positive Recency						
Mean	2.89	3.10	2.98	−0.11	0.11	−0.02
SD	(0.65)	(0.52)	(0.61)	(0.65)	(0.52)	(0.61)
N	99	70	169	99	70	169
High Variability						
Mean	2.96	3.12	3.03	0.18	0.34	0.25
SD	(0.58)	(0.55)	(0.57)	(0.58)	(0.55)	(0.57)
N	99	69	168	99	69	168
Low Variability						
Mean	2.67	2.93	2.78	0.17	0.43	0.28
SD	(0.51)	(0.38)	(0.47)	(0.51)	(0.38)	(0.47)
N	98	70	168	98	70	168

(not their forecast revisions) as the dependent variable reveals a significant main effect of forecast horizon ($F = 10.98$, $p < 0.001$), supporting H5. Specifically, analyst forecasts for a two-year-ahead horizon are greater than those for a one-year-ahead horizon, which are greater than those for the current year (mean forecast = \$3.15, \$3.04, \$2.90 for two-year-ahead, one-year-ahead, and current year, respectively).

When forecast revisions (instead of raw forecasts) are used as the dependent variable, there is again a significant main effect of forecast horizon ($F = 6.93$, $p = 0.001$), but the pattern of means is opposite to that for raw forecasts. Specifically, forecast revisions for a

two-year-ahead horizon are less than those for a one-year-ahead horizon, which are less than those for the current year (mean revisions = \$0.26, \$0.13, and \$0.12 for current-year, one-year-ahead, and two-year-ahead, respectively). In other words, raw forecasts are indeed greater for longer forecast horizons, but the *magnitude* of the revisions diminishes.

H6–H9 are the “interaction hypotheses.” H6–H8 posit interactions between analyst type and characteristics of the information on which earnings forecasts are based—trend (increasing or decreasing), recency (positive or negative), and variability (high or low). H9 posits an interaction between analyst type and forecast

Table 4. Results of Hypothesis Tests on Forecast Revisions

Source of Variance	SS	df	MS	F-statistic	Sig
Analyst Type	13.99	1	13.99	10.21	0.002
Trend	48.57	1	48.57	49.75	0.000
Recency	101.74	1	101.74	78.64	0.000
Variability	0.303	1	0.303	0.39	0.533
Analyst Type $\times$ Trend	1.48	1	1.48	1.52	0.22
Analyst Type $\times$ Recency	0.004	1	0.004	0.003	0.958
Analyst Type $\times$ Variability	0.754	1	0.754	0.97	0.326
Recency $\times$ Trend	25.87	1	25.87	40.49	0.000
Variability $\times$ Trend	51.84	1	51.84	63.22	0.000
Variability $\times$ Recency	5.23	1	5.23	8.23	0.005
Recency $\times$ Trend $\times$ Analyst Type	1.59	1	1.59	2.50	0.116
Variability $\times$ Trend $\times$ Analyst Type	2.73	1	2.73	3.33	0.07
Variability $\times$ Recency $\times$ Analyst Type	1.51	1	1.51	2.38	0.125
Variability $\times$ Recency $\times$ Trend	35.35	1	35.35	42.76	0.000
Variability $\times$ Recency $\times$ Trend $\times$ Analyst Type	1.84	1	1.84	2.23	0.137

horizon. The ANOVA in Table 4 reveals no significant interactions between analyst type and any of these factors. Thus, the forecast revisions of BSAs and SSAs are not influenced *differentially* by trend, recency, variability, or horizon.

Additional Analyses

We also examine the relationship between optimism and analyst experience, and between optimism and the type of firm for which the analyst works. Both have been the subject of empirical research. Clement [1999], Mikhail, Walther, and Willis [1997], and Brown [2001] find that analyst experience is positively associated with forecast accuracy. If forecast error (the difference between actual and forecasted earnings) is mainly the result of forecasts being greater than actual earnings (i.e., optimism), it follows that experience should be inversely associated with optimism. However, our results reveal a non-significant association between years of experience as an analyst and favorableness of either raw forecasts or forecast revisions.

Prior research has found that optimism is greater when analysts work for a firm that has underwriting relationships with the target firm (Lin and McNichols [1998], Dugar and Nathan [1995], Dechow, Hutton, and Sloan [2000]). If firms with underwriting relationships are typically national instead of regional or local firms, the forecasts of analysts who work for national firms should be more favorable than those of regional or local analysts. Parallel to our results for analyst experience, however, we find no significant differences in either raw forecasts or forecast revisions across national, regional, and local firms.

Discussion

This study provides experimental evidence on motivational and cognitive determinants of optimism in sell-side analyst earnings forecasts. Consistent with prior research, our results suggest that institutional incentives to be optimistic (relative to those to be accurate), which are naturally present in the SSA work environment, contribute to greater forecast optimism for SSAs than for BSAs. As hypothesized, SSAs make more favorable forecast revisions than BSAs.

Regarding cognitive determinants, the results suggest that certain characteristics of the information on which analysts base their forecasts contribute to optimism (EPS trend and recent EPS changes), while others do not (variability of the earnings series).

Consistent with the discounting of negative information, analyst forecast revisions for companies with a decreasing EPS trend exceed those for companies with an increasing EPS trend. Similarly, analyst forecast revisions in response to the most recent EPS changes show that negative recent information leads to more

favorable forecast revisions than positive recent information. Both results suggest that analysts discount negative information, and that negative recent information is reflected in their forecast revisions.

Contrary to prior research documenting a positive relationship between optimism and information variability (e.g., DeBondt and Forbes [1999], Das, Levine, and Sivaramakrishnan [1998], Huberts and Fuller [1995]), we did not find that analyst forecasts in response to variable information contribute to optimism. Finally, consistent with prior research, analyst forecasts increased significantly as the forecast horizon increased.

Because our results contribute to an understanding of the determinants of analyst optimism, they may be useful in reducing, or debiasing, the extent of optimism. On the other hand, many previous studies in judgment and decision making have shown that debiasing techniques are ineffective (Fischhoff [1982]). Understanding what makes analysts optimistic is an important first step in identifying more appropriate debiasing remedies.

These findings shed light on prior research establishing that motivational factors (Dugar and Nathan [1995], Francis and Philbrick [1993], Lin and McNichols [1998]) *or* cognitive factors (Abarbanell and Bernard [1992], Affleck-Graves, Davis, and Mendenhall [1990], DeBondt and Thaler [1990], Whitecotton [1996]) can explain optimism. Each, however, is only a partial explanation, as our results show that *both* contribute to optimism.

In addition, the only other study that compares the forecasts of SSAs and BSAs (Willis [2001]) finds that BSAs are more optimistic than SSAs, contrary to the results reported here. As noted earlier, this may be because the BSAs Willis studied had a financial stake in the funds for which they forecasted, unlike the BSAs here. In any event, while Willis [2001] provides evidence that financial investment is related to BSA optimism, we suggest there is more to the differences between SSA and BSA optimism.

Some limitations of this study should be noted. In particular, the amount of information given to the participants is only a subset of what is actually used by analysts when making their forecasts. Also, there were no controls over the amount of time participants spent on the task or on the additional information they may have accessed.⁹ These limitations, common in experimental studies, were necessary in order to secure adequate participation.

The results suggest several avenues for additional research. First, future research could examine the differential use of particular types of information by SSAs and BSAs, and its impact on forecasts. For example, non-financial statement information—collected in part from conversations with management—has been found to be particularly relevant to SSAs (Williams et al.

[1996]), especially when forecasting earnings for low-predictability firms (Das, Levine, and Sivaramakrishnan [1998]). However, this type of information may be more vulnerable to institutional pressures because of its lower verifiability and the social nature of its acquisition. Thus, for SSAs, negative non-financial statement information might provide a better “opportunity” for optimism than the financial information we used here.

Second, future research could try to disentangle the independent impact of each of the three typical motivational explanations for analyst optimism. Recall that prior research suggests SSAs bias their forecasts to 1) access managers’ private information, 2) increase their performance evaluation and/or compensation, and 3) enhance their firms’ revenue-generating ability. Although our results support the idea that the institutional incentives inherent in the SSA environment encourage optimism, this study was not designed to distinguish among these explanations. Future research could investigate the independent and joint effects of the different institutional incentives.

Third, analyst forecasts are likely to be influenced by other factors in addition to the motivational and cognitive factors examined here. For example, much research shows that dispositional characteristics such as one’s general propensity to be optimistic or pessimistic influence judgment (Dweck, Chiu, and Hong [1995], Erdley and Dweck [1993], Levy, Stroessner, and Dweck [1998], Shah, Higgins, and Friedman [1998], Doherty [2003]). Shah, Higgins, and Friedman [1998] have found that individuals with a “promotion” orientation make more extreme and risk-seeking judgments than individuals with a “prevention” orientation, while Sonoda [2002] finds that optimistic individuals overestimate the likelihood of non-contingent events. In addition, Tamura [2002] has documented a positive serial correlation between current and previous optimism in analyst forecasts, suggesting that more optimistic analysts tend to continue to be more optimistic, and less optimistic analysts tend to continue to be less optimistic.

Finally, analyst incentives can change throughout their careers and with changes in their work environment. As an analyst’s reputation becomes more firmly established, the need to curry management favor by issuing optimistic forecasts may diminish. Future research could examine whether tenure with a particular firm decreases the propensity to be optimistic.

In addition, technological advances have allowed an increasing number of analysts to work away from Wall Street and other traditional financial centers (Galant [1991]). Such a change may reduce professional and organizational identification (Bamber and Iyer [2002]), and mitigate the influence of institutional incentives. Further examination into this issue may provide insight into analysts’ pessimistic forecasts documented in some prior research (Brown [1997]).

In summary, this study supports the position that both motivational and cognitive determinants of analyst forecasts are important. Institutional incentives, negative prior earnings trends, recent negative information, and forecast horizon all contribute to analyst optimism. Further research on these and other variables is needed to better identify under which conditions they influence analyst forecasts, and to create a more complete understanding of expert judgment in this important domain.

Notes

1. Optimism is often defined as negative forecast bias, computed as [(actual earnings—analyst forecasted earnings)/actual earnings] (Bathke, Hassell, and Lukawitz [1991], Brown [1997], Dreman and Berry [1995], Fried and Givoly [1982]). In this paper, we define optimism relatively, in that the forecasted earnings of one group are compared to the forecasted earnings of another group, and the group with the higher forecast is said to produce more optimistic, or favorable, forecasts.
2. While most of this research has been conducted in U.S. settings, several studies using non-U.S. data also provide evidence of optimistic analyst earnings forecasts (e.g., Capstaff, Paudyal, and Rees [1995, 1998, 2001], DeBondt and Forbes [1999], Higgins [1998], Hussain [1996], and Beckers, Steliaros, and Thomson [2004]).
3. Willis’s [2001] finding of greater optimism for BSAs than SSAs may be a function of unique characteristics of his sample, including the fact that his BSAs had a financial stake in the funds for which they forecasted, unlike the BSAs we study here.
4. Scenario thinking, envisioning a sequence of events in which proposed actions/outcomes lead to future actions/outcomes, can result in optimism by inflating beliefs about the likelihood that envisioned positive future earnings outcomes will occur (Sedor [2002]).
5. Note that because of the time-contingent nature of forecasting, recency and the diagnosticity of the most recent information could be confounded. Thus, a recency effect could be due to either the recency or the diagnosticity of the information.
6. We also examined stock recommendations for the current year because 1) they are a key element of analyst research reports (Givoly and Lakonishok [1984], Schipper [1991]), 2) they are made by both SSAs and BSAs (Schipper [1991], Williams, Moyes, and Park [1996], Willis [2001]), and 3) they are also optimistic (Beneish [1991], Carleton, Chen, and Steiner [1998], Dugar and Nathan [1995], Lin and McNichols [1998], McNichols and O’Brien [1997], Womack [1996]). The participants made stock recommendations on a scale of strong buy, buy, hold, sell, and strong sell. However, many participants indicated they did not have sufficient information to make meaningful stock recommendations. Therefore, we do not report the recommendation results.
7. 4% of analysts did not indicate whether they worked for a national, regional, or local firm.
8. The other six companies were “fillers,” included to decrease the likelihood that participants would determine the variables being manipulated.
9. Interestingly, however, this may *better* simulate an analyst’s actual work environment relative to strictly controlling their time and effort. Some analysts may search for additional information and confer with others when actually making earnings forecasts, while others may not.

References

- Abarbanell, J.S. "Do Analysts' Forecasts Incorporate Information in Prior Stock Price Changes?" *Journal of Accounting and Economics*, 14, 2, June, (1991), pp. 147–165.
- Abarbanell, J.S., and V.L. Bernard. "Tests of Analysts' Overreaction/Underreaction to Earnings Information as an Explanation for Anomalous Stock Price Behavior." *Journal of Finance*, 47, 3, July, (1992), pp. 1181–1207.
- Ackert, L.F., and G. Athanassakos. "Prior Uncertainty, Analyst Bias, and Subsequent Abnormal Returns." *Journal of Financial Research*, 20, 2, Summer, (1997), pp. 263–273.
- Affleck-Graves, J., L.R. Davis, and R.R. Mendenhall. "Forecasts of Earnings Per Share: Possible Sources of Analyst Superiority and Bias." *Contemporary Accounting Research*, 6, 2, (1990), pp. 502–517.
- Ali, A., A. Klein, and J. Rosenfeld. "Analysts' Use of Information about Permanent and Transitory Earnings Components in Forecasting Annual EPS." *Accounting Review*, 67, 1, (1992), pp. 183–198.
- Amir, E., and Y. Ganzach. "Overreaction and Underreaction in Analysts' Forecasts." *Journal of Economic Behavior and Organization*, 37, 3, (1998), pp. 333–347.
- Ashton, A.H., and R.H. Ashton. "Sequential Belief Revision in Auditing." *Accounting Review*, 63, 4, (1988), pp. 623–642.
- Ashton, R.H., and J. Kennedy. "Eliminating Recency with Self-Review: The Case of Auditors' Going Concern Judgments." *Journal of Behavioral Decision Making*, 15, 3, (2002), pp. 221–231.
- Babad, E. "Can Accurate Knowledge Reduce Wishful Thinking in Voters' Predictions of Election Outcomes?" *Journal of Psychology*, 129, 3, May, (1995), pp. 285–301.
- Babad, E., M. Hills, and M. O'Driscoll. "Factors Influencing Wishful Thinking and Predictions of Election Outcomes." *Basic and Applied Social Psychology*, 13, 4, (1992), pp. 461–476.
- Babad, E., and Y. Katz. "Wishful Thinking—Against All Odds." *Journal of Applied Social Psychology*, 21, 23, (1991), pp. 1921–1938.
- Bamber, E.M., and V.M. Iyer. "Big 5 Auditors' Professional and Organizational Identification: Consistency or Conflict?" *Auditing: A Journal of Practice and Theory*, 21, 2, September, (2002), pp. 21–38.
- Bathke, A.W., Jr., J.M. Hassell, and J.M. Lukawitz. "Relative Accuracy of Quarterly Earnings Forecast Announcements." *Advances in Accounting*, 9, (1991), pp. 19–33.
- Bauman, W.S., and R.J. Dowen. "Security Analyst Forecasts and the Earnings Yield Anomaly." *Journal of Business Finance & Accounting*, 21, 2, March, (1994), pp. 283–291.
- Beckers, S., M. Stelarios, and A. Thomson. "Bias in European Analysts' Earnings Forecasts." *Financial Analysts Journal*, 60, 2, (2004), pp. 74–85.
- Beneish, M.D. "Stock Prices and the Dissemination of Analysts' Recommendations." *Journal of Business*, 64, 3, (1991), pp. 393–416.
- Biddle, G.C., and W.E. Ricks. "Analyst Forecast Errors and Stock Price Behavior Near the Earnings Announcement Dates of LIFO Adopters." *Journal of Accounting Research*, 26, 2, (1988), pp. 169–195.
- Brown, L.D. "Earnings Forecasting Research: Its Implications for Capital Markets Research." *International Journal of Forecasting*, 9, 3, November, (1993), pp. 295–320.
- Brown, L.D. "Analyst Forecasting Errors: Additional Evidence." *Financial Analysts Journal*, 53, 6, November/December, (1997), pp. 81–88.
- Brown, L.D. "A Temporal Analysis of Earnings Surprises: Profits versus Losses." *Journal of Accounting Research*, 39, September, (2001), pp. 221–242.
- Budescu, D.V., and M. Bruderman. "The Relationship Between the Illusion of Control and the Desirability Bias." *Journal of Behavioral Decision Making*, 8, 2, June, (1995), pp. 109–125.
- Butler, K.C., and H. Saraoglu. "Improving Analysts' Negative Earnings Forecasts." *Financial Analysts Journal*, May/June, (1999), pp. 48–56.
- Byram, S.J. "Cognitive and Motivational Factors Influencing Time Prediction." *Journal of Experimental Psychology: Applied*, 3, 3, (1997), pp. 216–239.
- Capstaff, J., K. Paudyal, and W. Rees. "The Accuracy and Rationality of Earnings Forecasts by UK Analysts." *Journal of Business Finance & Accounting*, 22, 1, (1995), pp. 69–87.
- Capstaff, J., K. Paudyal, and W. Rees. "Analysts' Forecasts of German Firms' Earnings: A Comparative Analysis." *Journal of International Financial Management and Accounting*, 9, 2, (1998), pp. 83–116.
- Capstaff, J., K. Paudyal, and W. Rees. "A Comparative Analysis of Earnings Forecasts in Europe." *Journal of Business Finance & Accounting*, 28, 5/6, (2001), pp. 531–563.
- Carleton, W.T., C.R. Chen, and T.L. Steiner. "Optimism Biases Among Brokerage and Non-Brokerage Firms' Equity Recommendations: Agency Costs in the Investment Industry." *Financial Management*, 27, 1, Spring, (1998), pp. 17–30.
- Clement, M. "Analyst Forecast Accuracy: Do Ability, Resources, and Portfolio Complexity Matter?" *Journal of Accounting and Economics*, 21, June, (1999), pp. 285–303.
- Critchfield, T., T. Dyckman, and J. Lakonishok. "An Evaluation of Security Analysts' Forecasts." *Accounting Review*, 53, 3, (1978), pp. 651–668.
- Daniel, K., D. Hirshleifer, and A. Subrahmanyam. "Investor Psychology and Security Market Under- and Overreactions." *Journal of Finance*, 53, (1998), pp. 1839–1885.
- Das, S., C.B. Levine, and K. Sivaramakrishnan. "Earnings Predictability and Bias in Analysts' Earnings Forecasts." *Accounting Review*, 73, 2, April, (1998), pp. 277–294.
- DeBondt, W., and W.P. Forbes. "Herd in Analysts Earnings Forecasts: Evidence from the United Kingdom." *European Financial Management*, 5, 2, (1999), pp. 143–163.
- DeBondt, F.M., and R. Thaler. "Do Security Analysts Overreact?" *American Economic Review Papers and Proceedings*, 80, 2, May, (1990), pp. 52–57.
- Dechow, P.M., A.P. Hutton, and R.G. Sloan. "The Relation between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance following Equity Offerings." *Contemporary Accounting Research*, 17, 1, (2000), pp. 1–33.
- Doherty, M.E. "Optimists, Pessimists, and Realists." In S.L. Schneider and J. Shanteau, eds., *Emerging Perspectives on Judgment and Decision Research*. New York: Cambridge University Press, 2003.
- Doran, D.T., T.R. Smaby, and J.L. Fize. "A Methodological Note on Earnings Forecast Evaluation: The Case of Value Line." *American Business Review*, June, (1995), pp. 65–71.
- Dorfman, J.R. "Analysts Devote More Time to Selling as Firms Keep Scorecard on Performance." *Wall Street Journal*, October 29, (1991), pp. C1–2.
- Dreman, D., and M. Berry. "Overreaction, Underreaction, and the Low-P/E Effect." *Financial Analysts Journal*, 51, 4, July–August, (1995), pp. 21–30.
- Dugar, A., and S. Nathan. "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Forecasts and Investment Recommendations." *Contemporary Accounting Research*, 12, 1, Fall, (1995), pp. 131–160.
- Dweck, C.S., C. Chiu, and Y. Hong. "Implicit Theories: Elaboration and Extension of the Model." *Psychological Inquiry*, 6, 4, (1995), pp. 322–333.
- Easterwood, J.C., and S.R. Nutt. "Inefficiency in Analysts' Earnings Forecasts: Systematic Misreaction or Systematic Optimism?" *Journal of Finance*, 54, 5, (1999), pp. 1777–1797.

- Elgers, P.T., and M.H. Lo. "Reductions in Analysts' Annual Earnings Forecast Errors Using Information in Prior Earnings and Security Returns." *Journal of Accounting Research*, 32, 2, Autumn, (1994), pp. 290–303.
- Erdley, C.A., and C. Dweck. "Children's Implicit Personality Theories as Predictors of Their Social Judgments." *Child Development*, 64, 3, June, (1993), pp. 863–878.
- Fischhoff, B. "Debiasing." In D. Kahneman, P. Slovic, and A. Tversky, eds., *Judgment and Uncertainty: Heuristics and Biases*. New York: Cambridge University Press, 1982.
- Fogarty, T.J., and R.K. Rogers. "Financial Analysts' Reports: An Extended Institutional Theory Evaluation." *Accounting, Organizations and Society*, 30, (2005), pp. 331–356.
- Francis, J., and D. Philbrick. "Analysts' Decisions as Products of a Multi-Task Environment." *Journal of Accounting Research*, 31, 2, Autumn, (1993), pp. 216–230.
- Frederickson, J.R., and J.S. Miller. "The Effects of Pro Forma Earnings Disclosures on Analysts' and Nonprofessional Investors' Equity Valuation Judgments." *Accounting Review*, 79, 3, (2004), pp. 667–686.
- Fried, D., and D. Givoly. "Financial Analysts' Forecasts of Earnings: A Better Surrogate for Earnings Expectations." *Journal of Accounting and Economics*, 4, 2, October, (1982), pp. 85–107.
- Galant, D. "Far From the Madding Crowd." *Institutional Investor*, 25, 14, December, (1991), pp. 157–158.
- Givoly, D., and J. Lakonishok. "Properties of Analysts' Forecasts of Earnings: A Review and Analysis of the Research." *Journal of Accounting Literature*, 3, Spring, (1984), pp. 117–152.
- Harvey, N. "Why Are Judgments Less Consistent in Less Predictable Task Situations?" *Organizational Behavior and Human Decision Processes*, 63, 3, September, (1995), pp. 247–263.
- Hassell, J.M., R.H. Jennings, and D.J. Lasser. "Management Earnings Forecasts: Their Usefulness as a Source of Firm-Specific Information to Security Analysts." *Journal of Financial Research*, 11, 4, (1988), pp. 303–319.
- Hayes, R.M. "The Impact of Trading Commission Incentives on Analysts' Stock Coverage Decisions and Earnings Forecasts." *Journal of Accounting Research*, 36, 2, (1998), pp. 299–321.
- Higgins, H.N. "Analyst Forecasting Performance in Seven Countries." *Financial Analysts Journal*, 54, 3, May/June, (1998), pp. 58–62.
- Huberts, L.C., and R.J. Fuller. "Predictability Bias in the U.S. Equity Market." *Financial Analysts Journal*, 51, 2, March–April, (1995), pp. 12–28.
- Hunton, J.E., and R.A. McEwen. "An Assessment of the Relation Between Analysts' Earnings Forecast Accuracy, Motivational Incentives and Cognitive Information Search Strategy." *Accounting Review*, 72, 4, October, (1997), pp. 497–515.
- Hussain, S. "Over-Reaction by Security Market Analysts: The Impact of Broker Status and Firm Size." *Journal of Business Finance & Accounting*, 23, 9/10, December, (1996), pp. 1223–1244.
- Jegadeesh, N., J. Kim, S.D. Krische, and C.M. Lee. "Analyzing the Analysts: When Do Recommendations Add Value?" *Journal of Finance*, 59, 3, (2004), pp. 1083–1124.
- Klein, A. "A Direct-Test of the Cognitive Bias Theory of Share Price Reversals." *Journal of Accounting and Economics*, 13, 2, July, (1990), pp. 155–166.
- Levy, S.R., S.J. Stroessner, and C.S. Dweck. "Stereotype Formation and Endorsement: The Role of Implicit Theories." *Journal of Personality and Social Psychology*, 74, 6, (1998), pp. 1421–1436.
- Lin, H.-W., and M. McNichols. "Underwriting Relationships, Analysts' Earnings Forecasts and Investment Recommendations." *Journal of Accounting and Economics*, 25, 1, February, (1998), pp. 101–127.
- Maines, L.A., and J.R.M. Hand. "Individuals' Perceptions and Misperceptions of Time Series Properties of Quarterly Earnings." *Accounting Review*, 71, 3, (1996), pp. 317–337.
- Matsumoto, D.A. "Management's Incentive to Avoid Negative Earnings Surprises." *Accounting Review*, 77, 3, (2002), pp. 483–514.
- McNichols, M., and P.C. O'Brien. "Self-Selection and Analyst Coverage." *Journal of Accounting Research*, 35, Supplement, (1997), pp. 167–199.
- Mikhail, M.B., B.R. Walther, and R.H. Willis. "Do Security Analysts Improve their Performance with Experience?" *Journal of Accounting Research*, 35, Supplement, (1997), pp. 131–157.
- Morlock, H. "The Effect of Outcome Desirability on Information Required for Decisions." *Behavioral Science*, 12, 4, July, (1967), pp. 296–300.
- Moses, O.D. "On Analysts' Earnings Forecasts for Failing Firms." *Journal of Business Finance & Accounting*, 17, 1, Spring, (1990), pp. 101–118.
- O'Brien, P.C. "Analysts' Forecasts as Earnings Expectations." *CFA Digest*, 18, 3, Summer, (1988), pp. 3–4.
- Peterson, D.K., and G.F. Pitz. "Effects of Amount of Information on Predictions of Uncertain Quantities." *Acta Psychologica*, 61, 3, April, (1986), pp. 229–241.
- Schipper, K. "Analysts' Forecasts." *Accounting Horizons*, 5, 4, December, (1991), pp. 105–121.
- Sears, D.O. "The Person-Positivity Bias." *Journal of Personality and Social Psychology*, 44, 2, (1983), pp. 233–250.
- Sedor, L.M. "An Explanation for Unintentional Optimism in Analysts' Earnings Forecasts." *Accounting Review*, 77, 4, (2002), pp. 731–753.
- Shah, J., E.T. Higgins, and R.S. Friedman. "Performance Incentives and Means: How Regulatory Focus Influences Goal Attainment." *Journal of Personality and Social Psychology*, 74, 2, February, (1998), pp. 285–293.
- Sonoda, A. "Optimistic Bias and Pessimistic Realism in Judgments of Contingency with Aversive or Rewarding Outcomes." *Psychological Reports*, 91, 2, (2002), pp. 445–456.
- SRI International. *Investor Information Needs and the Annual Report*. Morristown, NJ: Financial Executive Research Institute, 1987.
- Stickel, S.E. "Reputation and Performance Among Security Analysts." *Journal of Finance*, 47, (1992), pp. 1811–1836.
- Tamura, H. "Individual Analyst Characteristics and Forecast Error." *Financial Analysts Journal*, 58, 4, (2002), pp. 28–36.
- Weinstein, N.D. "Unrealistic Optimism about Future Life Events." *Journal of Personality and Social Psychology*, 39, 5, (1980), pp. 806–820.
- Whitcotton, S.M. "The Effects of Experience and a Decision Aid on the Slope, Scatter, and Bias of Earnings Forecasts." *Organizational Behavior and Human Decision Processes*, 66, 1, April, (1996), pp. 111–121.
- Williams, P.A., G.D. Moyes, and K. Park. "Factors Affecting Earnings Forecast Revisions for the Buy-Side and Sell-Side Analyst." *Accounting Horizons*, 10, 3, (1996), pp. 112–121.
- Willis, R.H. "Mutual Fund Manager Forecasting Behavior." *Journal of Accounting Research*, 39, 3, (2001), pp. 707–725.
- Womack, K.L. "Do Brokerage Analysts' Recommendations Have Investment Value?" *Journal of Finance*, 51, 1, March, (1996), pp. 137–165.

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