

Insider Trading Behavior Following Analyst Earnings Forecast Revisions

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In this paper, I study insider trading behavior following analyst earnings forecast revisions. Contrary to the notion that insiders trade consistent with analyst earnings forecast revisions in order to take advantage of the post forecast revision drift, I find that insiders react opposite to analyst earnings forecast revisions and are more likely to sell stock after upwards earnings forecasts revisions and are more likely to purchase stock after downwards earnings forecast revisions. My findings are consistent with insiders trading opportunistically following analyst earnings forecasts revisions.

Keywords: Insider Trading, Analyst Earnings Forecast Revisions, Financial Analysts

INTRODUCTION

Corporate insiders are generally perceived by regulators, academics, and the business press to have superior information about the value of their own firms. Accordingly, prior research documents that trades by insiders of their own companies' stock (hereafter, "insider trades") are useful for predicting future stock returns and firm performance (Keown & Pinkerton, 1981; Piotroski & Roulstone, 2005; Cohen et al., 2012). Nonetheless, while insiders are generally assumed to have the highest quality and quantity of firm-specific information useful for determining their firms' value, prior empirical research also suggests that outsiders such as financial analysts provide incremental information about firm value and researchers speculate that this is due to broader knowledge of how industry-wide trends impact firm operations (Hutton et al., 2013). Thus, when analyst forecasts revise their estimates of future earnings, they provide incremental information useful for both capital markets and insiders. In this study I empirically examine insider trades that are preceded by analyst earnings forecast revisions (hereafter, "post forecast revision trades").

Insiders could agree with or learn from analysts and trade in a manner that is consistent with the information signaled by analyst earnings forecast revisions. Purchasing after an upward earnings forecast revision or selling after a downward earnings forecast revision signals to external capital market participants that their information is consistent with the information contained in analyst earnings forecast revisions and also allows insiders to take advantage of the subsequent drift that follows analyst earnings forecast revisions documented by Givoly and Lakonishok (1980). Alternatively, insiders could disagree with analysts and trade in the opposite direction of prior analyst forecast revisions due to private knowledge about firm value that differs from the information known by financial analysts and which is revealed through their earnings forecasts revisions. Since both insiders and analysts hold useful incremental information about firm value, I believe market participants and academic researchers will be interested in examining whether insider trading behavior is related to analyst earnings forecast revisions. Specifically, my study opens up a broad avenue of research allowing for the examination of circumstances in which the information in post forecast revision trades aligns with or differs from the information in analyst earnings forecast revisions.

Using a sample of 244,511 firm trade-days, I study the information content of insider trades and analyst forecast revisions. I obtain insider trades for all insiders required to file their trading activity with the SEC, including executives, directors, and large shareholders, and aggregate insider purchases and sales separately to single trade-days while removing days which have both purchases and sales. I obtain the mean analyst earnings forecast from the Institutional Brokers' Estimate System (I/B/E/S) summary file and measure the consensus analyst forecast revision as the difference between the most recent consensus analyst forecast before the trade date and the consensus analyst forecast one month prior. I find that insiders are more likely to trade in a manner that contradicts the information contained in analyst earnings forecast revisions. Specifically, I find strong evidence that insiders have a greater propensity to purchase their own companies' own stock following downwards earnings forecast revisions and sell their own companies' stock following upwards earnings forecast revisions. My finding is inconsistent with the notion that insiders seek to benefit from the post forecast revision drift that follows analyst earnings forecast revisions. My finding is consistent with insiders opportunistically trading on private information that differs from the information known by financial analysts and revealed by their earnings forecast revisions.

The remainder of the paper is organized as follows. Section 2 summarizes the literature and presents my formal hypothesis. Section 3 describes the data and empirical design. Section 4 describes the empirical results. Section 5 concludes the paper.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Insider Trading

Despite regulations such as the Securities and Exchange Act of 1934 that prohibit corporate insiders from benefiting from private information by trading their company's own stock, prior research documents that insider trades contain relevant information about the value of insiders' firms. Specifically, insider trades are associated with future earnings, the firms' market-to-book ratio, and are often contrary to prior changes in the firm's stock price (Piotroski & Roulstone, 2005). Insider trades are also associated with positive abnormal returns, particularly when they are diverge from a normal trading routine (Cohen et al., 2012) or when information asymmetry is high (Aboody & Lev, 2000; Huddart & Ke, 2007). There are two primary explanations as to why insider trades have information about firm value. First, despite the apparent illegality of trading on private information, insiders could still benefit from trading in their company's own stock because they believe they will be able to shield themselves from future litigation by carefully timing their trades using their superior information (Ke et al., 2003). Second, the information in insider trades could be caused by insiders attempting to credibly signal information about firm value (Fidrmuc et al., 2006).

Despite the opportunity for managers to use their control over voluntary disclosure to benefit from insider trading, the empirical evidence is mixed regarding whether managers actually seize such opportunities. Noe (1999) finds that insiders do not appear to use their influence over discretionary disclosure in order to benefit from insider trades. Cheng and Lo (2006) further investigate the finding by Noe (1999) and find that managers tend to increase purchases following management forecasts that are negative in nature. However, they find no evidence that managers adjust the amount of selling they undertake following similar news disclosures. Their finding provides support for the notion that sales by insiders are given much greater scrutiny by regulatory authorities and so are less likely to be driven by managerial opportunism. In addition, capital market participants are able to assess the truthfulness of management guidance as it relates to insider trades and identify that management's willingness to misrepresent information varies with the capital market participants' ability to assess that bias (Rogers and Stocken, 2005).

Financial Analysts and Earnings Forecasts

Financial analysts discover and analyze information about the firms they follow in order to create financial reports used by capital market participants in order to make investing decisions. Lang and Lundholm (1996) find evidence most consistent with the notion that analysts act as intermediaries of information released by firm management. This notion is supported by other prior research which indicates

that analysts' strongest source of information is information given to them by managers at the firm they cover (Lees, 1981; Knutson, 1992) and that an analysts' decisions to follow firms are strongly related to the amount of information generated by a firm's management (Byrd et al., 1993; Lang & Lundholm, 1996). Other research further documents that analysts incorporate the information in management guidance into their forecasts (Jennings, 1987; Baginski & Hassell, 1990), particularly when management has established itself as having a strong forecasting reputation (Williams, 1996). However, analysts also play an important role as information discoverers (Livnat & Zhang, 2012). This is particularly true immediately prior to releases of information by firms and when firm disclosure is scarce (Chen et al., 2010). Analysts also appear to have an advantage in incorporating the effect of industry-wide information compared to managers (Hutton et al., 2012). Analyst earnings forecasts in particular are demonstrated to be useful to market participants and are superior to alternative time series forecasts for predicting earnings (Fried & Givoly, 1982; Brown & Hagerman, 1987), particularly in the short term (Bradshaw et al., 2012) and that the market responds strongly to whether companies are able to meet expectations formed by these forecasts (Kasznik & McNichols, 2002). The response of capital market participants to analyst forecast revisions is ultimately consistent with the notion that investors use analyst earnings forecasts to predict companies' future cash flows and, thus, fundamentally incorporate the information in them into their pricing of firms' common stock (Francis & Soffer, 1997; Gleason & Lee, 2003).

Hypothesis Development

There is considerable prior literature that studies the information content of insider trades and the motivations of insiders to purchase or sell stock in their own firms. There is also considerable prior literature that studies the information content of analyst forecasts and how the market processes the information in forecast revisions. When examining insider trading behavior following analyst earnings forecasts revisions, insiders could trade in a manner consistent with the information provided by the earnings forecast revision. In this case, insiders have information consistent with the information that they wish to profit from or alternatively seek to benefit from the post forecast revision drift that follows analyst earnings forecast revisions (Givoly & Lakonishok, 1980). Alternatively, insiders could trade in a manner inconsistent with the information provided by analyst earnings forecast revisions. If this is the case, insiders have information opposite to the information analysts have and reveal through their earnings forecast revisions and seek either to profit from this information, to credibly signal their private information to the market (Fidrmuc et al., 2006) or to mislead the market regarding future prospect for their firms (Benabou & Laroque, 1992). Since it is initially unclear how insider trading behavior change following analyst forecast revisions, I pose my hypothesis in the null form:

H1: The likelihood of an insider to trade in the stock in their own firm is unrelated to analyst forecast revisions.

DATA AND SAMPLE

Data

I gather data on insider trades from the Thomson Reuters Insiders Data Table 1 and consensus analyst forecast data from the I/B/E/S Summary File.¹ I gather financial statement information from Compustat and daily stock price data from the Center for Research in Securities Prices (CRSP). I restrict my analysis to only trades occurring from 2003 onward because of the substantial change in the regulatory environment caused by passage of the Sarbanes-Oxley Act of 2002 and Regulation FD. Finally, I winsorize all data at the 1 and 99% levels to mitigate the influence of outliers on my results.

I aggregate insider purchases and sales separately across all insiders by firm-day (hereafter, 'firm trade-day'). I do not net sales and purchases on a given trade-day in order to examine the asymmetric behavior that insider purchases and sales represent. Sales reflect an immediate payout or loss to the insider but purchases result in exposure to future changes in the company's stock price. Thus, I believe that there are considerable differences in the incentives between buying and selling and so I do not treat purchases as

‘negative sales’ and vice-versa. To control for any potentially confounding effects of days which have both a sale and a purchase, I delete any firm trade-days in which there are both purchases and sales.²

I measure analyst earnings forecast revisions ($Revision_{i,t}$) as the change in the consensus analyst forecast, measured as the change in the median analyst forecast as of each firm (i) trade-day (t) from 30 days prior to the firm trade-day until the trade-day, scaled by stock price (P) on the trade day, such that $Revision_{i,t} = (ConsenFC_{i,t} - ConsenFC_{i,t-30})/P_{i,t}$. This generates a signed change in the analyst forecast preceding each insider trade-day. Consistent with prior literature, I eliminate all firms with a stock price of one dollar in order to avoid the influence of penny stocks and in order to avoid the confounding effects of fractional denominators in the revision calculation.

To build my sample I first start with all insider purchases and sales available in Thomson Reuters beginning in January 2003.³ Aggregating total insider trades (2,711,266 trades) to firm trade-days results in a sample of 642,263 firm trade-days. In order to create my analyst earnings forecast revision measure, I gather consensus analyst forecasts from the I/B/E/S Summary file.⁴ Since my consensus analyst forecast revision variables are scaled by stock price, I eliminate all firms with a stock price of less than one dollar. This results in a sample of 338,594 total firm trade-day observations which I can associate with a prior consensus analyst forecast revision. I gather annual financial statement data from Compustat to create my control variables and calculate abnormal returns using daily stock price data from CRSP. This results in a final sample of 244,511 firm trade-day observations for my primary empirical tests. I present the details of my sample selection in Table 1:

TABLE 1
SAMPLE SELECTION

All insider purchases and sales from Thomson Reuters from 2003-2012 with transaction value data	2,711,266
Aggregated to firm trade-day	642,263
Less: Observations without analyst earnings forecast data	(269,740)
Less: Missing stock price data from CRSP	(30,056)
Less: Firms with stock price less than one dollar	(3,873)
Total firm trade-day observations for which measure can be created:	338,594
Data missing for control variables:	
Less: Missing returns data from CRSP	(41,280)
Less: Missing financial statement data from Compustat	(49,506)
Less: Trade-days with both purchase and sale	(3,297)
Final Sample (firm trade-days)	244,511

EMPIRICAL ANALYSIS

Univariate Analysis

I first examine how insider trading behavior changes following analyst forecasts using univariate analysis. In Table 2 below I sort insider trade-days into six different classifications according to the analyst forecast revision and whether insiders purchase or sell stock on that day. In order to simplify visual examination of univariate differences across each group, I present the table in two ways: in Panel A each group is presented in percentage terms of total insider trade-days, whereas in Panel B each group is presented in percentage terms of days in which insiders only purchase or sell stock.

TABLE 2
UNIVARIATE ANALYSIS OF POST FORECAST REVISION TRADING

PANEL A - PERCENT OF TOTAL INSIDER TRADES			
	<u>Purchase</u>	<u>Sale</u>	<u>Total</u>
Upward Revision	4.78%	32.07%	36.85%
No Revision	6.93%	31.95%	38.89%
Downward Revision	<u>6.76%</u>	<u>17.51%</u>	<u>24.27%</u>
Total	18.47%	81.53%	100.00 %
Difference between Upward Revision and Downward Revision	1.98%*** (<.0001)	14.56%** * (<.0001)	
PANEL B - PERCENT OF TOTAL INSIDER PURCHASES OR SALES			
	<u>% of Purchases</u>	<u>% of Sales</u>	
Upward Revision	25.88%	39.33%	
No Revision	37.52%	39.20%	
Downward Revision	<u>36.60%</u>	<u>21.47%</u>	
Total	100.00%	100.00%	
Difference between Upward Revision and Downward Revision	10.72%*** (<.0001)	17.86%** * (<.0001)	

P-values are presented in parentheses and are based on two-tailed tests. ***, **, and * represents significance at the 1%, 5%, and 10% levels, respectively. Purchases Only is the subset of trade-days in which one or more insider purchases occur. Sales Only is the subset of trade-days in which one or more insider sales occur. Upward Revision equals 1 if the consensus analyst forecast rose prior to the insider trade. No Revision equals 1 if the consensus analyst forecast stayed the same prior to the insider trade. Downward Revision equals 1 if the consensus analyst forecast fell prior to the insider trade.

Insider purchases following downward analyst forecast revisions account for 6.76 percent of total insider trade-days and 36.60 percent of total purchase-days. Insider sales following upward revisions account for 32.07 percent of total insider trade-days and 39.33 percent of total sale-days. I find that insiders are significantly more likely to purchase following downwards analyst forecast revisions than after upwards analyst forecast revisions (p-value <0.0001) and that insiders are significantly more likely to sell following upwards analyst forecast revisions compared to after downwards forecast revisions (p-value <0.0001). Thus, I find univariate evidence that insiders change their trading behavior following analyst forecast revisions. Nonetheless, there are other factors that influence both insider trading behavior and analyst forecast revisions and so in the next section I adopt a multivariate regression approach to examine how insider trading behavior changes following analyst forecast revisions.

Multivariate Regression Design

In order to examine the impact of analyst forecast revisions on insider trading behavior, I estimate the following logistic regression with standard errors clustered by firm:

$$\begin{aligned} \text{Purchase}_{i,t} = & \alpha_1 \text{UpwardRevision}_{i,t} + \alpha_2 \text{NoRevision}_{i,t} + \alpha_3 \text{DownwardRevision}_{i,t} \\ & + \alpha_4 \text{Earnings}_{i,t} + \alpha_5 \text{Loss}_{i,t} + \alpha_6 (\text{Earnings}_{i,t} * \text{Loss}_{i,t}) + \alpha_7 \text{Market Value}_{i,t} + \alpha_8 \text{Book to Market}_{i,t} \\ & + \alpha_9 \text{Dividends}_{i,t} + \text{Industry Fixed Effects} + \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

I present variable definitions for each variable in equation (1) in Table 3. Note that all firm-specific variables are formed as of firm (i) trade-day (t):

TABLE 3
VARIABLE DEFINITIONS

<u>Variable Name:</u>	<u>Definition:</u>
Purchase _{i,t}	Dummy variable which equals 1 if there is one or more purchases by insiders, and 0 if there is one or more sales by insiders.
Upward Revision _{i,t}	Dummy variable which equals 1 if the consensus analyst forecast increased, and equals 0 otherwise.
No Revision _{i,t}	Dummy variable which equals 1 if the consensus analyst forecast does not change, and equals 0 otherwise.
Downward Revision _{i,t}	Dummy variable which equals 1 if the consensus analyst forecast decreased, and equals 0 otherwise.
Earnings _{i,t}	Earnings for the prior fiscal year (Compustat item OIADP)
Loss _{i,t}	Dummy variable which equals 1 if earnings is negative, and 0 otherwise.
Market Value _{i,t}	Market value, measured as common shared outstanding (Compustat item CSHO) times per share closing price at the end of the prior fiscal year (Compustat item PRCC_F).
Book to Market _{i,t}	Book to market ratio, measured as the book value of equity (Compustat item AT minus compustat item LT) divided by market value (Compustat item CSHO times Compustat item PRCC_F).
Dividends _{i,t}	Dividends paid in the prior fiscal year (Compustat item DVC)
Industry Fixed Effects	Industry dummy variables, based on Fama-French 48 industries.
Year Fixed Effects	Year dummy variables, based on calendar years.

Descriptive Statistics

Table 4 below lists the variables used in my univariate and multivariate regression analysis and presents descriptive statistics for each.

Sales by insiders are substantially greater in magnitude and frequency compared to purchases by insiders for the firms in my sample. Specifically, 81.53 percent of the trade-days in my sample are due to sales whereas 18.47 percent of the trade-days in my sample are due to purchases. This is due to most companies offering employees stock in the companies they manage in order to align their incentives with shareholders. Thus, by definition, insiders will need to sell their own companies' stock much more often and in much greater amounts than how much they purchase. Nonetheless, the mean insider purchase is 13,440 shares of stock, representing a substantial increase in the investment in their own firms when insiders decide to purchase their own companies' stock. Next, I present multivariate regression results.

TABLE 4
DESCRIPTIVE STATISTICS

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>1Q</u>	<u>Median</u>	<u>3Q</u>	<u>Std. Dev.</u>
Earnings	244,511	0.0668	0.0280	0.0730	0.1184	0.1143
Loss (Dummy)	244,511	0.1539	0.0000	0.0000	0.0000	0.3608
Size	244,511	5.3259	0.3102	0.8539	2.8112	15.5970
Market to Book	244,511	0.5006	0.2466	0.4116	0.6497	0.3850
Dividends	244,511	58.0181	0.0000	0.0000	14.4860	207.2793
Purchase Days (Dummy)	244,511	0.1847	0.0000	0.0000	0.0000	38.8100
Shares Purchased (in thousands)	244,511	13.4398	0.0000	0.0000	0.0000	1200.2372
Sales (Dummy)	244,511	0.8153	1.0000	1.0000	1.0000	0.3881
Shares Sold (in thousands)	244,511	70.6300	1.0000	6.3460	22.8500	1402.3488
Upward Forecast Revision (Dummy)	244,511	0.3685	0.0000	0.0000	100.0000	0.04824
No Forecast Revision (Dummy)	244,511	0.3889	0.0000	0.0000	100.0000	0.4875
Downward Forecast Revision (Dummy)	244,511	0.2427	0.0000	0.0000	0.0000	0.4287

Regression Results

I present results of estimating equation (1) using logistic regression with robust standard errors clustered by firm below in Table 5:

TABLE 5
MULTIVARIATE ANALYSIS OF POST FORECAST REVISION TRADES

Dependent Variable = 1 if Insider Purchase, 0 if Insider Sale	
Revision Variables:	
Upward Revision	-4.3720*** ($<.0001$)
No Revision	-4.0073*** ($<.0001$)
Downward Revision	-3.6285*** ($<.0001$)
F-Test of Coefficients:	
Upward Revision - Downward Revision	-0.7435*** ($<.0001$)
Control Variables:	
Earnings	0.7568 (0.1131)
Loss	0.6267*** ($<.0001$)
Earnings*Loss	-2.6076*** (0.0003)
Market Value	-0.0254*** ($<.0001$)
Book to Market	0.8578*** ($<.0001$)
Dividends	0.0007*** (0.0066)
Industry Fixed Effects	Included

Year Fixed Effects	Included
Observations	244511
Wald Chi-Squared Statistic	3565.53***

P-values are presented in parentheses and are based on two-tailed tests based on robust standard errors clustered by firm. *** represents statistical significance at the 1 percent level. Upward Revision is a dummy variable which equals 1 if the consensus analyst forecast rose prior to the insider trade, and equals 0 otherwise. No Revision is a dummy variable which equals 1 if the consensus analyst forecast stayed the same prior to the insider trade, and equals 0 otherwise. Downward Revision is a dummy variable which equals 1 if the consensus analyst forecast fell prior to the insider trade, and equals 0 otherwise. Control variables are as previously defined.

Consistent with results from my univariate analysis of the relation between analyst earnings forecast revisions and insider trading behavior, I find using multivariate regression results that insider trading behavior is contrary to the information provided by analyst earnings' forecasts. Specifically, I find that insiders are substantially less likely to sell their companies' own stock (and, thus, more likely to buy their companies' own stock) following downward earnings forecast revisions compared to upwards earnings forecasts revisions. My findings are consistent with the notion that insiders behave opportunistically following analyst earnings forecasts revision and insider trades reflect private information about the value of the firm and these trades can be perceived as a signal to the capital markets regarding this private information.

CONCLUSION

Insider trading poses a curious problem to academic research in accounting and finance. Specifically, insider trading is a heavily regulated activity with potentially massive consequences to insiders who are identified as taking advantage of private information to further their own personal wealth at the cost of outside investors. Insider trading is a fundamentally necessary activity due to many corporations choosing to compensate their managers using their own companies' stock in order to align their incentives with shareholders. Nonetheless, even though insider trading is highly regulated, insider trades are consistently documented to have incremental information about firm value. My paper seeks to examine the problem in a new light by examining insider trading behavior following major information events, analyst earnings forecast revisions. I find that insider trading behavior differs according to whether analyst earnings forecasts are revised upwards or downwards. My findings are inconsistent with the notion that insider trades are purely random or rhythmic. Instead, insiders are systematically responding to these external information events. My findings also provides evidence that insider trades are a valuable source of information to capital market participants and that insider trades are particularly useful information events when considered in the context of other events such as analyst earnings forecast revisions. Accordingly, my paper should be of interest to capital market participants who seek to identify information events relevant to determining firm value.

My paper should also be of interest to regulators and academics who are interested in identifying the information content of insider trades. My empirical findings are consistent with the notion that insider trades are responding to an important information event, analyst earnings forecast revisions, in a systematic way. Specifically, I find that insiders are more likely to sell following upward earnings forecast revisions and more likely to buy following downward earnings forecast revisions. Surprisingly, my findings are inconsistent with insiders seeking to benefit from the post forecast revision drift documented by Givoly and Lakonishok (1980). These insider trades will, in expectation, be unprofitable unless there is information known by insiders that is inconsistent with the changes in analysts' earnings forecasts. Accordingly, post forecast revision trades may be a means by which insiders signal to the capital markets beliefs that their firms are undervalued following downward earnings forecast revisions or overvalued following upward earnings forecast revisions while also serving to benefit themselves from this private contrarian information. My paper opens an avenue of research examining post forecast revision insider trades and

whether insider trades that are either consistent or inconsistent with prior earnings forecast changes provide unique information to the capital markets.

ENDNOTES

1. My findings remain similar if I use data from the I/B/E/S Analyst Detail File to generate consensus analyst forecasts.
2. My findings remain similar if I keep firm trade-days in which I allow both purchases and sales to occur on a given trade-day.
3. I begin my sample in 2003 due to the passage of the Sarbanes Oxley Act and Regulation Fair Disclosure in 2002. Both regulations substantially changed the role of managerial insiders in corporations and provided stricter limitations on the way that financial analysts can interact with corporate insiders.
4. I use the median analyst forecast in my reported results. My results remain similar when I use the mean analyst forecast instead.

REFERENCES

- Aboody, D., & Lev, B.I. (2000). Information asymmetry, R&D, and insider gains. *Journal of Finance*, 55(6), 315-346.
- Baginski, S.P., & Hassell, J.M. (1990). The market interpretation of management earnings forecasts as a predictor of subsequent financial analyst forecast revision. *The Accounting Review*, 65(1), 175-190.
- Benabou, R., & Laroque, G.R. (1992). Using privileged information to manipulate markets; Insiders, Gurus, and Credibility. *The Quarterly Journal of Economics*, 107(3), 921-958.
- Bradshaw, M.T., Drake, M.S., Myers, J.N., & Myers, L.A. (2012). A re-examination of analysts' superiority over time-series forecasts of annual earnings. *Review of Accounting Studies*, 17(4), 944-968.
- Brown, L.D., Hagerman, R.L., Griffin, P.A., & Zmijewski, M.E. (1987). Security analyst superiority relative to univariate time-series models in forecasting quarterly earnings. *Journal of Accounting and Economics*, 9(1), 61-87.
- Byrd, J.W., Johnson, M., & Johnson, M.S. (1993). *Investor relations and the cost of capital*. Working paper, University of Michigan, Ann Arbor, MI.
- 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.
- Cheng, Q., & Lo, K. (2006). Insider trading and voluntary disclosures. *Journal of Accounting Research*, 44(5), 815-848.
- Cohen, L.H., Malloy, C.J., & Pomorski, L. (2012). Decoding insider information. *Journal of Finance*, 67(3), 1009-1043.
- Fidrmuc, J.P., Goergen, M., & Renneboog, L. (2006). Insider trading, news releases, and ownership concentration. *Journal of Finance*, 61(6), 2931-2973.
- Francis, J.R., & Soffer, L.C. (1997). The relative informativeness of analysts' stock recommendations and earnings forecast revisions. *Journal of Accounting Research*, 35(2), 193-211.
- Fried, D., & Givoly, D. (1982). Financial analysts' forecasts of earnings: A better surrogate for market expectations. *Journal of Accounting and Economics*, 4(2), 85-107.
- Gleason, C.A., & Lee, C.M.C. (2003). Analyst forecast revisions and market price discovery. *The Accounting Review*, 78(1), 193-225.
- Givoly, D., & Lakonishok, J. (1980). Financial analysts' forecasts of earnings. *Journal of Banking and Finance*, 4(2), 221-233.
- Huddart, S.J., & Ke, B. (2007). Information asymmetry and cross-sectional variation in insider trading. *Contemporary Accounting Research*, 24(1), 195-232.

- Hutton, A.P., Lee, L.F., & Shu, S.Z. (2012). Do managers always know better? The relative accuracy of management and analyst forecasts. *Journal of Accounting Research*, 50(5), 1217-1244.
- Jennings, R.H. (1987). Unsystematic security price movements, managerial earnings forecasts, and revisions in analyst earnings forecasts. *Journal of Accounting Research*, 25(1), 90-110.
- Ke, B., Huddart, S.J., & Petroni, K.R. (2003). What insiders know about future earnings and how they use it: Evidence from insider trades. *Journal of Accounting and Economics*, 35(3), 315-346.
- Kaszniak, R., & McNichols, M.F. (2002). Does meeting earnings expectations matter? Evidence from analyst forecast revisions and share prices. *Journal of Accounting Research*, 40(3), 727-759.
- Keown, A.J., & Pinkerton, J.M. (1981). Merger announcements and insider trading activity: An empirical investigation. *Journal of Finance*, 36(4), 855-869.
- Knutson, P.H. (1992). *Financial reporting in the 1990s and beyond: A position paper of the Association for Investment Management and Research*. Working paper, University of Pennsylvania, Philadelphia, PA.
- Lang, M.H., & Lundholm, R.J. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review*, 71(4), 467-492.
- Lees, F.A. (1981). *Public Disclosure of Corporate Earnings Forecasts*. New York, NY: The Conference Board.
- Livnat, J., & Zhang, Y. (2012). Information interpretation or information discovery: Which role of analysts do investors value more? *Review of Accounting Studies*, 17, 612-641.
- Noe, C.F. (1999). Voluntary disclosures and insider transactions. *Journal of Accounting and Economics*, 27(3), 305-326.
- Piotroski, J.D., & Roulstone, D.T. (2005). Do insider trades reflect both contrarian beliefs and superior knowledge about future cash flow realizations? *Journal of Accounting and Economics*, 39(1), 55-81.
- Rogers, J.L., & Stocken, P.C. (2005). Credibility of management forecasts. *The Accounting Review*, 80(4), 1233-1260.
- Williams, P.A. (1996). The relation between a prior earnings forecast by management and analyst response to a current management forecast. *The Accounting Review*, 71(1), 103-113.