Insider Trading and Motivations for Earnings Management

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We develop and test three possible hypotheses to explain motivations for earnings management. These hypotheses are opportunism, signaling and smoothing. We examine the patterns of insider trading associated with earnings management. Our main findings are: (1) the buying trades of insiders decrease in frequency relative to selling trades as earnings are managed upwards, (2) after controlling for size, the trading pattern of insiders still holds and (3) when partitioning the sample on past returns, the trading pattern is still present within categories of past returns. These results are consistent with opportunism.

INTRODUCTION

Recent studies in accounting and finance have focused on the extent to which managers alter reported earnings for their own benefit. Prior studies present evidence of a relation between managers' contractual agreements and earnings patterns. These patterns are often consistent with earnings being reported in a fashion beneficial to managers.[1] However, when the interests of managers are aligned with those of shareholders, earnings management can be viewed as an efficient signaling mechanism; either as a means of communicating future prospects to shareholders or for the purpose of maintaining shareholder value.[2] These alternative motivations for exercising earnings discretion may make it difficult for investors to make an ex-ante assessment of the implication that earnings management has for future stock price performance. The purpose of this study is to provide evidence of the motivation behind earnings management. We do this by assessing the trading pattern that occurs for insiders during the period of time around their recognition of discretionary accruals in the financial statements.

Generally Accepted Accounting Principles allow managers flexibility in recognizing the accrual portion of earnings. In turn, managers may have the opportunity to adjust reported earnings to some predetermined benchmark as they are exercising their discretion. Since alternative motivations for earnings management exist with each having a different implication for future earnings, it may be difficult for investors to comprehend the relation between managers' current-period earnings discretion and future earnings. Accordingly, Sloan (1996) finds that investors do not fully understand the implications of current-period accruals for future earnings while Xie (2001) finds that this is largely due to the managed or discretionary portion of accruals. In fact, Beneish and Vargus (2002) find that when upward earnings management is followed by insider selling, on average, there are future stock price declines. Yet even when income increasing earnings management is accompanied by insider selling, Beneish and Vargus

(2002) find that investors do not fully understand the implications of the income increasing earnings management for future stock performance.

The findings of Beneish and Vargus (2002) further suggest that when managers exercise their discretion over accruals, they may possess private information regarding the nature and persistence of those reported accruals. As such, managers could use this information to profitably trade in their own stocks. Prior evidence also suggests that managers act as informed traders; buying (selling) in advance of stock price increases (decreases) [Seyhun (1986), Rozeff and Zaman (1988)].

In this study we investigate the relation between earnings discretion and patterns of insider trading as a means to provide insight about the various motivations for earnings management. Consistent with prior literature we use discretionary accruals to measure managers' discretion in reported earnings.[3] We rank stocks each year into deciles based on discretionary accruals where the lowest (highest) decile represents firms with the greatest income decreasing (increasing) discretionary accruals. We then examine the direction of insider trading across the discretionary accrual deciles.

Our main findings are: (1) cross-sectionally, on average the buying trades of insiders decrease in frequency relative to selling trades as firms manage earnings upwards and these results are more pronounced for extreme earnings management, (2) the size of the firm is related to discretionary accruals, (3) after controlling for size, the trading pattern of insiders still holds and (4) when partitioning the sample on past returns, the trading pattern is still present within categories of past returns. These results are consistent with an opportunistic hypothesis of earnings management.

The remainder of the paper is organized as follows. The next section provides further background and formulates the hypotheses of the study followed by the data and methodology. Then, the findings and concluding remarks are given.

BACKGROUND AND HYPOTHESES

We discuss background, three alternative motivations for earnings management and the patterns of insider trading that would be consistent with those motivations.

Background

There is a long stream of literature showing an association between some (predetermined) earnings benchmark and earnings management. This literature decomposes earnings into two parts, discretionary and nondiscretionary earnings where discretionary accruals proxy for the discretionary or managed portion of earnings. Discretionary accruals have been shown to be related to benchmarks based on bonus compensation schemes (Gaver, Gaver & Austin, 1995 and Holthausen, Larker & Sloan, 1995), analyst and/or market expectations (DeFond & Park, 1997 and Payne & Robb, 2001), and managers' assessment of permanent earnings (Chaney, Jeter & Lewis, 1998).

A firm's discretionary accruals must sum to zero over time; implying that managing earnings in the current period will impact future periods' earnings in the opposite direction when those discretionary accruals reverse.[4] For example, assume that nondiscretionary earnings fall short of the current periods' benchmark and that management opts to meet the current benchmark via income-increasing discretionary accruals. Ceteris paribus and assuming no subsequent earnings management, future periods' bottom-line earnings will now deviate from the benchmark by the sum of the shortfall of that period's nondiscretionary earnings plus the reversal of prior periods' income-increasing discretionary accruals.[5]

Of course managers may expect nondiscretionary earnings to change in future periods. If subsequent nondiscretionary earnings are expected to increase (decrease), the impact from the reversal of previous income increasing (decreasing) discretionary accruals on the deviation of subsequent earnings from a given benchmark would be partially or fully mitigated by the change in nondiscretionary earnings. Thus the effect of managing earnings toward a benchmark in a given period can either enhance or inhibit the firm's ability to meet a benchmark in future periods.

Given evidence which suggests systematic mispricing for discretionary accruals (Xie, 2001) and the extensive literature finding an association between changes in stock price and earnings surprises, the

impact of current-period discretionary accruals can be reflected in future returns. Evidence also suggests that managers have some notion about future (permanent) earnings when making their earnings management decisions (DeFond and Park, 1997 and Chaney, Jeter and Lewis, 1998). In addition, Rozeff and Zaman, (1988) show that insiders trade on their private information; buying ahead of price increases and selling prior to price declines.

Taken together, prior findings indicate that managers can make some assessment of the impact that their accrual management decisions will have on future returns and trade on this private information. Our research contributes to the existing literature by offering insight about motivations for earnings management. To accomplish this, we document the relation between insider trading behavior and earnings management decisions.[6] We categorize managers' potential motivations as opportunism, signaling and smoothing.

Hypotheses

In the following sections we discuss our three competing hypotheses; opportunism, signaling and smoothing.

Opportunism

We first define the opportunism hypothesis. Suppose that insider trades are motivated, at least in part, by private information and knowledge concerning equity values. Suppose also that outside investors do not fully understand the nature and persistence of accruals (Sloan, 1996). Under this hypothesis managerial discretion over accruals can be viewed as a means of either delaying information to, or misleading outside investors. For example, managers may manipulate earnings upwards to either avoid adverse contractual consequences or to conceal a firm's actual deteriorating performance. DeFond and Jiambalvo (1994) find evidence of upward earnings management when firms are close to debt covenant violations, and Teoh, Welch and Wong (1998) document instances of upward earnings management for initial public offerings, followed by poor performance.

Managers may also use their discretion to manage earnings downwards when future performance is expected to be good. This income decreasing earnings management can indicate a firm's strength, conveying the notion that the firm can withstand additional expenses and remain prosperous (Beneish, 2001, p.2). Other plausible motivations for managers to conceal or reduce the appearance of profitability are explored in the literature. Jones (1991) finds evidence of downward earnings management when firms are faced with an import relief investigation. She asserts income-decreasing earnings discretion could enhance future earnings by increasing the likelihood of import relief provisions through various avenues such as tariffs and quotas. Balsam, Chen and Sankaraguruswamy (2003) argue that managers have incentives to temporarily depress stock prices just prior to the date for granting stock options. The result could be to avoid or reduce compensation expense related to the difference between the exercise price and market price on the grant dates. As support, they find a negative relation between discretionary accruals and subsequent stock option grants.

Ceteris paribus, each of the described instances of downward earnings management implies that future earnings will increase relative to current-period earnings. Taken one step further, if current period discretionary accruals are mispriced (Xie, 2001), stock price would also be expected to increase as the firm's (more positive) future earnings are revealed. Thus assuming that insiders' motivation for earnings management decisions is to either delay current-period information to future periods or to maximize their personal benefits, the opportunism hypothesis predicts that insiders are more likely to sell stocks when they manipulate earnings upwards or buy when they manipulate earnings downwards.

Signaling

A second hypothesis is signaling. Under this hypothesis we posit that managers use discretionary accruals to communicate their expectations of future performance to outsiders. For instance Beneish (2001, p.3) states "…managerial discretion is a means for managers to reveal to investors their private expectations about the firm's future cash flows." This view is also reflected by Healy and Whalen (1998)

who assert that "…managers can also use accounting judgment to make financial reports more informative… if, for example, certain accounting choices or estimates are perceived to be costly and therefore credible signals of a firm's financial performance." In this scenario, downward earnings management can be viewed as a sign of deteriorating future performance; the notion here is that current period earnings are being saved for future periods when performance is expected to decline relative to the current period's unmanaged earnings. For example, suppose a firm's unmanaged earnings exceed the relevant earnings benchmark.[7] Management can signal that it is unlikely they can meet the current level of unmanaged earnings in the future by managing earnings downward. Thus future unmanaged earnings are expected to deteriorate relative to current-period unmanaged earnings. Setting aside reserves as a way to maintain future performance is also recognized in Beneish (2001), and Scott (p. 309). On the flipside, upward earnings management could be a signal of expected improvement in future unmanaged earnings. Accordingly, the signaling hypothesis predicts managers will buy more (less) if earnings are managed upwards (downwards).

Smoothing

A third plausible hypothesis is that earnings are managed for reasons other than opportunism or signaling; we call this the earnings smoothing hypothesis. Under this hypothesis, managerial discretion over accruals is presumed to be related to intertemporal smoothing of temporary earnings shocks to reduce variability in reported earnings. Consistent with this are the findings from Graham, Harvey and Rajgopal's (2005) survey of Chief Financial Officers which shows that 96.9% of respondents prefer smooth earnings and approximately78% of respondents would give up economic value in exchange for smooth earnings. Motivations for smoothing can vary. For example, Fudenberg and Tirole (1995) assert that managers may smooth earnings for job security reasons while DeFond and Park (1997) provide empirical support by documenting that managers consider both current and future earnings performance when exercising discretion over accruals. Income smoothing may also "enhance the informational value of the firm" (Wang and Williams, 1994) and result in higher market value and lower perceptions of market-related risk (Michelson, Jordan-Wagner, and Wootton, 1995). Goel and Thakor (2003) assert that more volatile earnings create a greater information advantage for informed investors. Thus uninformed investors may prefer that managers smooth earnings. Overall, evidence suggests managers have incentives to reduce the volatility in reported earnings by smoothing.[8]

If managers are simply smoothing earnings then ceteris paribus, managers would not expect future reported earnings to deviate greatly from current period reported earnings. As such, managers would not expect subsequent stock price changes related to their current period earnings discretion. In this scenario insider buying and selling is expected to be random across all discretionary accrual deciles. Accordingly, the smoothing hypothesis does not predict a systematic relation between insider trading and earnings management.

DATA AND METHODOLOGY

In this section we discuss our estimates of discretionary accruals and insider trading data. We also provide descriptive statistics for our sample.

Discretionary Accruals and Descriptive Statistics

The difference between actual and expected accounting accruals represents discretionary accruals and proxies for earnings management. DeChow, Sloan and Sweeney (1995) show that a modified version of the Jones (1991) model tends to outperform other models for detecting earnings management. The Jones (1991) model is used to estimate a firm's expected accruals while controlling for changes in a firm's economic conditions such as sales revenues. This model has been used extensively in the earnings management literature and is estimated in a firm-specific, time-series manner (Jones 1991) and in an annual cross-sectional fashion (DeFond and Jiambalvo, 1994).

Annual cross-sectional estimation of the modified Jones model offers several advantages over firm-specific estimation. First, it does not require a lengthy time-series for individual firms. This reduces the survivorship bias and potentially increases sample size. Second, annual cross-sectional estimation does not assume that parameters for estimating expected accruals are stationary over time. Third, the cross-sectional version has been shown to be better specified than the firm-specific time-series version (Subramanyam, 1996). Thus, we use the cross-sectional version of the modified Jones model to estimate expected accruals, and since managers have more discretion over short-term accruals (Teoh, Welch and Wong, 1998) we focus on short-term discretionary accruals.

To obtain *discretionary* short-term accruals, we first calculate *actual* short-term accruals as follows:

EQUATION 1
ESTIMATING ACTUAL SHORT-TERM ACCRUALS

$$STA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta CASH_{i,t} + \Delta STD_{i,t}$$

Where
$STA_{i,t}$ = Short Term Accruals; firm i, period t.
$\Delta CA_{i,t}$ = Change in Current Assets, Compustat item # 4; firm i, period t.
$\Delta CL_{i,t}$ = Change in Current Liabilities, Compustat item # 5; firm i, period t.
$\Delta CASH_{i,t}$ = Change in Cash, Compustat item # 1; firm i, period t.
$\Delta STD_{i,t}$ = Change in the Long-Term portion of Current Debt, Compustat item #34; firm i, period t.

Parameters used to estimate expected accruals are derived from the following equation which is estimated cross-sectionally for each two-digit SIC code, for each year. A SIC code must contain a minimum of 8 observations during a given year to allow sufficient degrees of freedom to estimate the model (Ghosh and Olsen, 2009).

Kothari, Leone and Wasley (2005) show that misspecification in the modified Jones model is reduced when including an intercept term and lagged return on assets when estimating the model parameters.[9] Thus, we estimate expected accruals using the following equation.

EQUATION 2
ESTIMATING DISCRETIONARY ACCRUALS

$$STA_{i,t} = \alpha_0 + \alpha_1 1/TA_{i,t-1} + \alpha_2(\Delta Sales_{i,t} - \Delta AR_{i,t}) + \alpha_3 ROA_{i,t-1} + e_{i,t}$$

Where
TA = Total Assets, Compustat item #6, firm i, period t-1.
$\Delta Sales_{i,t}$ = Change in Sales, Compustat item #12; firm i, period t.
$\Delta AR_{i,t}$ = Change in Accounts Receivable, Compustat item #2; firm i, period t.
$ROA_{i,t}$ = Return on Assets (net income/total assets); Compustat item #18/Compustat item #6 for firm i, period t.

Industry subscripts are excluded and $\Delta Sales_{i,t}$, $\Delta AR_{i,t}$, $STA_{i,t}$, and the intercept term are deflated by beginning of period assets (Compustat data item # 6). Parameters from equation (2) are used to yield a firm's expected accruals. Discretionary accruals represent the difference between a firm's total short-term accruals, deflated by lagged total assets and its expected accruals from equation (2). Accordingly, the sample mean discretionary accruals of 0.0004 can be interpreted as meaning that discretionary accruals are 0.04 percent of beginning of period total assets.

Table 1 provides descriptive statistics of our sample. The number of firm years in the discretionary accruals sample over the 22-year period is 33,030. The mean (median) discretionary accruals for the

TABLE 1
DESCRIPTIVE STATISTICS

N=33,030 Firm Years	Mean	Median	Minimum	Maximum
Discretionary Accruals	0.0004	-0.0027	-3.414	4.165
Market Value of Equity*	2,025.85	154.73	0.011	301,238.44

N=33,030 Firm Years	Mean (Median) Discretionary Accruals and Market Value of Equity Across Deciles; Years 1978-00								

Decile	1	2	3	4	5	6	7	8	9	10
Discr Accr	-.201 (-.152)	-.071 (-.069)	-.040 (-.039)	-.021 (-.021)	-.008 (-.008)	.003 (.003)	.016 (.015)	.035 (.034)	.070 (.067)	.223 (.163)
Market Value*	565.19 (36.99)	1866.59 (113.77)	2164.76 (213.39)	2661.19 (312.06)	3524.52 (425.47)	3340.23 (484.31)	2782.05 (354.08)	1849.02 (161.04)	1097.77 (88.63)	398.14 (47.81)

The available sample consists of 33,030 firm-year observations over the years 1978 – 2000. Market value of equity is the beginning of period market value computed as Compustat data items #199 (common shares outstanding) * #25 (price per share). Discretionary accruals are defined as short-term discretionary accruals represented by the firm-specific error from a cross-sectional version of the modified Jones model (equation 2). Discretionary accrual deciles consist of observations sorted on discretionary accruals from equation 2, by year. Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Observations are ranked over the years 1978 - 2000.
*Market Value of Equity is in Millions of Dollars

entire sample are 0.0004 (-0.0027) while the minimum (maximum) values are -3.414 (4.165). The range for mean (median) discretionary accruals is from -0.201 (-0.152) for the most negative decile to 0.223 (0.163) for the most positive decile. Discretionary accruals vary between years, within deciles. For example, mean discretionary accruals for decile 1 ranges from -0.106 in 1978 to -0.256 in 1996. Because there is a wide inter-temporal range in discretionary accrual values, within deciles, we use a decile indicator variable when obtaining estimates in regression analyses. Over all years, average market value of equity across deciles of our sample ranges from a high of 3.524 billion dollars in decile 5 to a low of 398 million dollars in decile 10. We also note that the average market value of equity is smaller for the extreme discretionary accrual deciles, decile 1 and decile 10.

Insider Trading

We find the insider trading transactions of companies in the discretionary accrual deciles using data compiled by the Securities and Exchange Commission (SEC) and made available through the National Archives and Records Administration. We restrict the transactions to open-market purchases and sales. Option related and other transactions are ignored. In addition we categorize insiders into three separate groups based on their involvement with the day-to-day activities of the firm. The categories are Chairman, Officers and Officer Directors, and Other Directors and Beneficial Owners.

Discretionary accruals proxy for earnings management and although discretionary accruals are recognized at year end, this year-end measurement represents the cumulation of events over the prior twelve months. So that we can investigate insiders' assessments of the conditions giving rise to earnings management we examine insider trading for the six months prior and subsequent to the recognition of discretionary accruals. Thus, first we form discretionary accrual deciles at the end of each year. Second, we designate each of the six months prior and subsequent to the formation of the discretionary accrual

TABLE 2
PERCENTAGE OF BUY TRANSACTIONS IN THREE CATEGORIES OF INSIDERS
1978 - 2000

	Percent Buys (#Buys / All Transactions)			
Discr Accrual Decile	Chairman	Officers and Officer Directors	Directors and Beneficial Owners	All Insiders
1	80.95 (34/42)	47.79 (205/429)	56.16 (333/593)	53.76 (572/1064)
2	60.42 (29/48)	41.24 (200/485)	57.82 (403/697)	51.38 (632/1230)
3	55.81 (24/43)	34.35 (180/524)	60.28 (513/851)	50.56 (717/1418)
4	51.28 (20/39)	38.48 (202/525)	61.28 (519/847)	52.52 (741/1411)
5	67.74 (21/31)	38.95 (201/516)	63.09 (535/848)	54.27 (757/1395)
6	57.14 (28/49)	39.53 (238/602)	61.28 (614/1002)	53.24 (880/1653)
7	64.91 (37/57)	34.45 (237/688)	62.69 (719/1147)	52.48 (993/1892)
8	66.00 (33/50)	35.92 (273/760)	59.51 (707/1188)	50.70 (1013/1998)
9	49.15 (29/59)	35.14 (273/777)	56.58 (722/1276)	48.48 (1024/2112)
10	55.56 (35/63)	38.96 (330/847)	46.77 (587/1255)	43.97 (952/2165)
Column Mean	60.29 (290/481)	38.01 (2339/6153)	58.24 (5652/9704)	50.69 (8281/16338)
Chi. Sq.	14.93	31.52	97.18	63.19
Prob.	0.093	0.0002	<0.0001	<0.0001

Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Percent buys represent the proportion of months where the number of open-market buy transactions exceeds the number of open-market sell transactions, relative to months containing either a buy or a sell transaction. The category 'Chairman' includes chairman of the board, where 'Officers and Officer Directors' represents officers and officer directors and 'Directors and Beneficial Owners' are other directors and beneficial owners. The category 'All Insiders' is the aggregate of all three categories. The chi-square test statistic tests for differences across all deciles and the probability is the probability of obtaining the chi-square value.

deciles as an insider buy (sell) month if the number of insiders buying (selling) is greater than insiders selling (buying) in that month. Table 2 shows that total firm-months across all three categories of insiders is 45,012 over the 22-year sample period and total firm-years across all three categories of insiders is 16,338.

FINDINGS

During the six months before and after the formation of discretionary accrual deciles, for each month and for each stock in each decile, we count the number of insider buys and sells. We then sum the total number of buys and sells over all firm years within each discretionary accrual decile. Table 2 reports the percentage and proportion of open market purchases to open market purchases plus sales by discretionary accrual deciles and categories of insiders; chairman, officers and officer directors, and other directors and beneficial owners. The trends shown in this table are supported by regression analyses presented in Tables 3 through 5.

The average percentages of buy transactions across all discretionary accrual deciles are quite different for the three types of insiders. Table 2 shows that the overall percentages of buy transactions are 60.29, 38.01 and 58.24 for chairman, officers and officer directors, and other directors and beneficial owners,

respectively. Even though the percentage of buy transactions is different across categories of insiders, the trend for the percentage of buys within categories and across discretionary accrual deciles is consistent. The fraction of buys generally tends to decrease as we move from income decreasing to income increasing discretionary accrual deciles. Among chairmen, the fraction of insider trading transactions that are purchases falls from 80.95 percent to 55.56 percent between deciles 1 and 10. For officers and officer directors, the percentage of transactions that are buys decrease from 47.79 percent in the extreme income decreasing category to 38.96 in the extreme income increasing accrual category. For other directors and beneficial owners the buys decrease from 56.16 percent to 46.77 percent as you go from the extreme income decreasing to the extreme income increasing discretionary accrual decile.

Chi-square statistics show that the differences across deciles are significant for all three categories. Although the difference in the percentage of buys across discretionary accrual deciles appears greatest for the chairman category, this difference is only marginally significant. This may be related to the low number of observations available for the chairman category. When combining the three categories of insiders, the percentage of buys decreases significantly from 53.76 percent in decile 1 to 43.97 percent in decile 10. These results suggest systematic insider trading behavior that is related to extreme earnings management.

To obtain significance tests for the patterns reported in Table 2, we conduct regressions and use dichotomous variables to represent the discretionary accrual deciles. Table 3 reports the results for a cross-sectional regression where the dependent variable is the firm-specific proportion of all insider open-market buy transactions for that year. The independent variables are the dichotomous variables for discretionary accrual deciles 2 through 10 where the dichotomous variable is 'one' if the firm-year falls into that discretionary accrual decile and is 'zero' otherwise. The intercept term represents the coefficient to the dichotomous variable representing discretionary accrual decile 1.

The estimate of the average fraction of purchases in discretionary accruals decile 1 (DA1) for all insider categories is 0.536. The coefficient to the dichotomous variable representing decile 10 is –0.085 and significant (t = -4.92). The coefficient implies that the proportion of buys to total transactions in decile 10 is 45.1 percent. Most coefficients to the dichotomous variables for discretionary accrual deciles 2 through 10 have negative signs implying that the proportion of buys is less for all discretionary accrual deciles relative to decile 1, where earnings discretion is most income decreasing. However, the coefficients to the dichotomous variables representing deciles 9 and 10 are the only coefficients that are significantly negative. Overall, the evidence shows that as income increasing earnings management becomes more extreme, the proportion of insiders buying decreases significantly.

The middle decile rankings for discretionary accruals exhibit virtually no earnings management. Referring to table 1 we can see that mean and median discretionary accruals in deciles 5 and 6 are close to zero. Although discretionary accruals in decile 4 (7) are negative (positive), their relative magnitude is much less than the magnitude of discretionary accruals in the more extreme deciles. Recall from Table 1 that discretionary accruals range from 0.016 in decile 7 to -0.021 in decile 4 compared to 0.070 and -0.071 in deciles 9 and 2, respectively. Relatively speaking, earnings management in these middle deciles is either absent or small in magnitude. Our hypotheses are based on earnings management. Accordingly, we do not expect to observe systematic trading patterns related to earnings discretion in the middle deciles since earnings management is either absent or negligible.

Inside information about the relation between current earnings management decisions and future prospects of the firm may vary among our categories of insiders. The availability of (or lack of) inside information about the circumstances surrounding earnings management decisions directly influences insiders' ability to profit from inside information. Thus the trading patterns across categories of insiders may differ if those insiders are privy to a different information set. Officers and officer directors tend to be more involved in the day-to-day running of the firm and may have better information about the implications of earnings management. Thus, we run similar regressions for each of the three insider groups and focus our attention on the officers and officer director group.

The second column of table 3 provides estimates of the regression coefficients. In this case, the estimated intercept is 47.6 percent which represents the percentage of buying in the lowest or most income decreasing decile of discretionary accruals. The highest discretionary accruals decile has an

TABLE 3
DIFFERENCES IN PROPORTION OF BUYS ACROSS DECILES

Model: $PBUY = \alpha_0 + \beta_1 DA2 + \beta_2 DA3 + \beta_3 DA4 + \beta_4 DA5 + \beta_5 DA6 + \beta_6 DA7 + \beta_7 DA8 + \beta_8 DA9 + \beta_9 DA10$			
Insider Categories			
	Chairman	*Officers and Officer Directors*	*Directors and Beneficial Owners*	*All Insiders*
α_0	0.81	0.476	0.560	0.536
t-stat	11.17	21.66	30.66	37.96
p-value	<0.0001	<0.0001	<0.0001	<0.0001
β_1	-0.216	-0.061	0.018	-0.022
t-stat	-2.18	-2.02	0.70	-1.14
p-value	0.03	0.0434	0.4823	0.2551
β_2	-0.236	-0.128	0.047	-0.026
t-stat	-2.31	-4.31	1.97	-1.37
p-value	0.021	<0.0001	0.0487	0.1701
β_3	-0.277	-0.085	0.052	-0.009
t-stat	-2.65.	-2.87	2.17	-0.46
p-value	0.008	0.0041	0.0304	0.6426
β_4	-0.131	-0.078	0.074	0.012
t-stat	-1.18	-2.63	3.12	0.62
p-value	0.239	0.0084	0.0018	0.5333
β_5	-0.247	-0.081	0.058	-0.0004
t-stat	-2.50	-2.80	2.53	-0.02
p-value	0.013	0.005	0.0113	0.9812
β_6	-0.178	-0.122	0.074	-0.004
t-stat	-1.86	-4.36	3.27	-0.24
p-value	0.063	<0.0001	0.0011	0.8133
β_7	-0.147	-0.106	0.037	-0.024
t-stat	-1.49	-3.83	1.64	-1.35
p-value	0.136	0.0001	0.1008	0.1772
β_8	-0.349	-0.104	0.037	-0.043
t-stat	-3.69	-3.81	1.64	-2.46
p-value	0.0003	.0001	0.6832	0.0138
β_9	-0.264	-0.073	-0.082	-0.085
t-stat	-2.83	-2.69	-3.68	-4.92
p-value	0.0049	0.0072	0.0002	<0.0001
Discretionary accrual decile (DA) represents observations sorted on discretionary accruals (equation 2), by year. Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Observations are ranked over the years 1978 - 2000. A dichotomous variable is created which takes on the value of '1' if the observation is contained within that decile and '0' otherwise. The Intercept term in the regression equation represents the coefficient for the lowest discretionary accrual decile (DA1). PBUY represents the proportion of buy transactions over total transactions for each firm-year.			

estimate that is a significant 7.3 percent lower, or indicates a 40.3 percent proportion of buys to total transactions. All coefficients to the discretionary accrual dichotomous variables are likewise significant,

and negative. These results suggest that officers are more likely to reduce their buying when earnings discretion is more income increasing and increase buying when earnings discretion is most income decreasing. Overall, our findings provide evidence in support of the opportunism hypothesis.

Controlling for Firm Size

There is some evidence that insiders tend to buy more heavily the shares of small companies and sell more shares of large companies (Seyhun (1986), Rozeff and Zaman (1998)). Our sample exhibits a systematic relation between size and the discretionary accruals deciles. From Table 1 it is evident that firms in the lowest and highest discretionary accruals deciles are more likely to be smaller firms while the middle deciles are likely to be larger firms. It is therefore possible that our observations of insiders' trading behavior could be partially or fully explained by the size of the firm. To obtain a more powerful test, we control for this source of variation. Table 4 shows regressions that include the firm year's natural log of beginning of year market value of equity as an additional explanatory variable.

For all insiders, the estimate of the intercept is 0.794 and represents the size-adjusted percentage of buys in the lowest or most income decreasing decile for discretionary accruals. The estimated coefficient to the size variable is –0.040 which is highly significant (t=9.65) indicating that the larger the firm, the less likely that insiders will buy. The coefficient to the dichotomous variable for decile 10 is –0.168 and is also significant (t=3.30). Hence, the evidence shows significantly lower buying in decile 10 even after controlling for the size effect. These tests in conjunction with the earlier tests provide evidence in support of the opportunism hypothesis and clearly reject both the signaling hypothesis and the earnings smoothing hypothesis in the more extreme discretionary accrual deciles.

Past Returns

Seyhun (1986) documents that insiders are more likely to buy after stock price declines and to sell after stock price increases. The underlying notion is that if prices have risen in the past via higher returns, future returns are expected to be lower. Recall that the opportunism hypothesis predicts that positive (negative) discretionary accruals would indicate lower (higher) future returns. Thus, the question remains; is insiders' buying behavior influenced by past returns, discretionary accruals, or both?

To address this issue, we partition firm years into three categories based on the past 12-month returns. Returns are the buy and hold returns cumulated over the 12-month period just prior to the recognition period for discretionary accruals. Thus, if the financial statement period is January through December of 1990, we cumulate past returns over January through December of 1989. If one of the monthly returns is missing, we eliminate that firm year. Further, if the monthly return just prior to the return cumulation period is missing, we eliminate that firm year because the subsequent monthly return may include two month's returns. Consequently, the 12-month buy and hold return could represent returns for 13 months. We then rank firms on past returns, by year. Using this ranking, we partition firm years into high, medium and low past returns categories. Using this returns ranking and the original ranking for discretionary accruals, for all firms having insider trading data, we first partition by returns and within each returns partition we have decile rankings for discretionary accruals where decile 1 (10) has the most income decreasing (increasing) values for discretionary accruals.

Model: PBUY= α_0 + β_1DA2 + β_2DA3 + β_3DA4 + β_4DA5 + β_5DA6 + β_6DA7 + β_7DA8 + β_8DA9 + β_9DA10 + β_{10}lnsize			
Insider Categories			
	Chairman	*Officers and Officer Directors*	*Directors and Beneficial Owners*	*All Insiders*
α_0 t-stat p-value	1.08 4.67 <0.0001	0.728 8.43 <0.0001	0.793 14.37 <0.0001	0.794 16.56 <0.0001
β_1 t-stat p-value	-0.262 -1.11 0.2684	0.02 0.21 0.8309	0.016 0.25 0.8028	-0.013 -0.24 0.8126
β_2 t-stat p-value	-0.468 -1.97 0.0514	-0.005 -0.06 0.9552	0.040 0.68 0.4975	0.003 0.05 0.9600
β_3 t-stat p-value	-0.407 -1.67 0.0972	-0.014 -0.16 0.8756	0.061 1.01 0.3104	0.011 0.22 0.8268
β_4 t-stat p-value	-0.260 -1.09 0.2761	0.066 0.71 0.4776	0.087 1.45 0.1465	0.064 1.23 0.2174
β_5 t-stat p-value	-0.282 -1.28 0.2029	0.009 0.10 0.9165	0.088 1.51 0.1313	0.042 0.83 0.4052
β_6 t-stat p-value	-0.155 -0.71 0.4778	-0.054 -0.61 0.5422	0.094 1.64 0.1020	0.037 0.75 0.4537
β_7 t-stat p-value	-0.113 -0.48 0.6313	-0.061 -0.70 0.4842	0.061 1.07 0.2852	0.001 0.02 0.9812
β_8 t-stat p-value	-0.354 -1.53 0.1288	-0.046 -0.52 .6020	0.006 0.10 0.9185	-0.036 -0.72 0.4745
β_9 t-stat p-value	-0.473 -1.98 0.0496	-0.177 -1.96 0.0499	-0.127 -2.15 0.0317	-0.168 -3.30 0.0010
B_{10} t-stat p-value	-0.039 -1.96 0.0518	-0.058 -8.21 <0.0001	-0.032 -6.53 <0.0001	-0.040 -9.65 <0.0001
Lnsize is the natural log of the beginning of period market value of equity, computed as Compustat data items #199 (common shares outstanding) * #25 (price per share). Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Observations are ranked over the years 1978 - 2000. A dichotomous variable is created which takes on the value of '1' if the observation is contained within that decile and '0' otherwise. The Intercept term in the regression equation represents the coefficient for the lowest discretionary accrual decile.			

Table 5 gives the proportion of insider buying across these categories. When prior returns are high, 38.62 percent of transactions are buys yet when prior returns are low, 53.97 percent of transactions are

buys. This is consistent with the idea that when prices are high, insiders buy less and vice versa. When examining the proportion of buys across discretionary accrual deciles and within return categories, the proportion of buys is less for the highest discretionary accrual decile than for the lowest discretionary accrual decile for each prior returns category. For instance, when past returns are high, the proportion of buys is 38.20 (31.20) percent for the most income decreasing (increasing) discretionary accrual decile. The gap in proportion of buys appears greater for the medium and low past return categories. In the medium past return category, the proportion of buys is 51.88 (39.47) percent for the most income decreasing (increasing) discretionary accrual decile and in the low past return category the proportion of buys is 56.85 (46.72) for the most income decreasing (increasing) discretionary accrual decile. Consistent with Seyhun (1986) our data shows that the overall proportion of buys is negatively related to past returns. Chi-square statistics and associated p-values also indicate that there is a significant difference in proportion of buys across discretionary accrual deciles within each of the prior return categories. Taken together, evidence suggests that insider trading is related to both past returns and the level of discretionary accruals.

TABLE 5
PERCENTAGE OF BUY TRANSACTIONS 1978 - 2000
SORTING ON PAST RETURNS

Discr Accrual Decile	High Returns	Medium Returns	Low Returns
1	38.20 (68/178)	51.88 (83/160)	56.85 (137/241)
2	37.50 (102/272)	45.21 (99/219)	52.55 (165/314)
3	38.58 (130/337)	45.05 (141/313)	58.02 (188/324)
4	39.81 (123/309)	48.01 (169/352)	57.96 (142/245)
5	45.24 (133/294)	54.12 (184/340)	58.75 (141/240)
6	40.93 (149/364)	53.86 (251/466)	56.88 (153/269)
7	41.01 (162/395)	56.10 (285/508)	51.61 (176/341)
8	42.70 (196/459)	49.02 (250/510)	52.36 (211/403)
9	36.63 (189/516)	42.48 (178/419)	53.88 (257/477)
10	31.05 (186/599)	39.47 (135/342)	46.72 (192/411)
Column Mean	38.62 (1438/3723)	48.91 (1775/3629)	53.97 (1762/3265)
Chi. Sq.	26.11	41.65	17.79
Prob.	0.002	<0.0001	0.0377

Discretionary accrual decile represent observations sorted on discretionary accruals (equation 2), by year. Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Firms are categorized into High, Medium and Low Returns partitions based on prior year's returns. The chi-square test statistic tests for differences across all deciles and the probability is the probability of obtaining the chi-square value.

To assess whether there is a significant difference in the proportion of buys across discretionary accrual deciles and within prior returns category, we estimate a regression where the dependent variable is the proportion of insider buys relative to all insider open-market transactions. The independent variable is '1' if the observation is included in that discretionary accrual decile and '0' otherwise, and where the intercept term represents discretionary accrual decile '1.'

Table 6 shows that within the medium and low past returns categories, the proportion of buys is significantly less for the most income increasing than for the most income decreasing discretionary accruals decile at $p < 0.05$. When examining the high past returns category, the same pattern exists however, results are not significant at conventional levels. Overall, evidence in table 6 suggest that the proportion of buys is significantly less in the most income increasing discretionary accrual decile for both the medium and low prior returns category, providing support for the opportunism hypothesis for these returns categories.

TABLE 6
ASSESSING PROPORTION OF BUYS ACROSS DECILES FOR PAST RETURNS CATEGORIES

Model: $PBUY = \alpha_0 + \beta_1 DA2 + \beta_2 DA3 + \beta_3 DA4 + \beta_4 DA5 + \beta_5 DA6 + \beta_6 DA7 + \beta_7 DA8 + \beta_8 DA9 + \beta_9 DA10$			
	High Returns	*Medium Returns*	*Low Returns*
α_0	0.386	0.5222	0.563
t-stat	11.70	14.40	19.06
p-value	<0.0001	<0.0001	<0.0001
β_1	-0.006	-0.064	-0.033
t-stat	-0.14	-1.34	-0.83
p-value	0.8905	0.176	0.4053
β_2	0.013	-0.058	0.009
t-stat	0.32	-1.30	0.23
p-value	0.7481	0.195	0.818
β_3	0.026	-0.037	0.018
t-stat	0.63	-0.84	0.44
p-value	0.5263	0.403	0.658
β_4	0.0751	0.032	0.014
t-stat	1.80	0.73	0.34
p-value	0.0721	0.464	0.7346
β_5	0.0386	0.021	0.009
t-stat	0.96	0.49	0.23
p-value	0.3372	0.624	0.817
β_6	0.0445	0.044	-0.033
t-stat	1.12	1.07	-0.85
p-value	0.2627	0.286	0.396
β_7	0.055	-0.026	-0.033
t-stat	1.42	-0.63	-0.89
p-value	0.1563	0.526	0.3748
β_8	-0.003	-0.080	-0.024
t-stat	-0.09	-1.87	-0.67
p-value	0.9285	0.061	0.5017
β_9	-0.056	-0.110	-0.082
t-stat	-1.49	-2.49	-2.19
p-value	0.1372	0.0127	0.0285

Discretionary accrual decile (DA) represents observations sorted on discretionary accruals (equation 2), by year. Decile 1 (10) represents observations with the lowest (highest) value of discretionary accruals. Observations are ranked over the years 1978 - 2000. A dichotomous variable is created which takes on the value of '1' if the observation is contained within that decile and '0' otherwise. The Intercept term in the regression equation represents the coefficient for the lowest discretionary accrual decile (DA1). PBUY represents the proportion of buy transactions over total transactions for each firm-year.

SUMMARY AND CONCLUSIONS

We examine the relation between insider trading and discretionary accruals, which proxy for earnings management. Three alternative motivations for earnings management are discussed. The first is opportunism, whereby managers are more likely to use discretionary accruals to delay current information or to mislead outside investors. Opportunism predicts that insiders will buy (sell) more when discretionary accruals are used to decrease (increase) current-period earnings. The second motivation is signaling which implies managers use discretionary accruals to communicate their private information about the firm's future prospects. This motivation predicts that insiders will buy (sell) more when discretionary accruals are used to increase (decrease) current-period earnings. Finally, the third motivation is smoothing. If managers use discretionary accruals to smooth temporary earnings shocks, there should be no systematic relation between discretionary accruals and insider's trading behavior.

The evidence presented is consistent with the opportunism hypothesis as defined in this paper. Overall, we find that as discretionary accruals become more income increasing, the proportion of buy transactions relative to all insider transactions is decreasing. Because of the documented relation between discretionary accruals and firm size, we control for firm size and still find that the proportion of buy transactions is significantly less for extreme income-increasing discretionary accruals. Prior evidence also shows that insiders are more likely to buy after stock price declines and to sell after stock price increases. Hence, if stock prices have increased future returns are expected to be lower and vice versa. This prediction regarding future returns is also true of the opportunism hypothesis, if income-increasing discretionary accruals are used to delay bad news then, stock prices are expected to decline in the future. To assess whether past returns, discretionary accruals or both are related to insider trading behavior, we partition observations on past returns and examine insider trading within those partitions. Again, when there are extreme income-increasing discretionary accruals, insider buying is less. Thus, the overall evidence supports the opportunism hypothesis.

ENDNOTES

1. See for instance Healy (1985), Gaver, Gaver and Austin (1995) and Hothausen, Larker and Sloan (1995) for evidence of an association between earnings management activities and maximizing potential bonus awards.
2. One example of maintaining shareholder value is income smoothing. Payne and Robb (2000) discuss the negative stock price implications for firms that do not meet analyst earnings expectations. They show that earnings are managed upwards (downwards) when unmanaged earnings are below (above) analyst expectations. In a similar vein, Chaney, Jeter and Lewis (1998) assert that managers use discretionary accruals to smooth earnings around their assessment of the firm's permanent earnings.
3. Some examples are Gaver, Gaver and Austin (1995), Xie (2001), DeFond and Jiambalvo (1994), DeFond and Park (1997), Payne and Robb (2000), Teoh, Welch and Wong (1998), and Jones (1991). Cites are not intended to be exhaustive.
4. For example, current period earnings can be increased by reducing current period bad debt expense. Yet this does not change the economic substance of accounts receivable and at some point in the future these accounts will increase bad debt expense as they are not collected. The end result is simply to defer the decrease in earnings to a later period.
5. For ease of explanation we assume the earnings benchmark is stable across time. However, we also recognize that this may not be the case and our hypotheses are not dependent on such an assumption.
6. One advantage of our research design, directly examining the relation between earnings management and insider trading activity, is that results are not subject to the shortcomings of CAPM or some other benchmark model for estimating abnormal returns.
7. We do not explicitly define a benchmark but do recognize that a number of proxies could represent managements' benchmark. Some examples are management forecasts, analyst forecasts, market expectations and prior periods' reported earnings.
8. These incentives are not intended to be exhaustive.

9. Although Kothari, Leone and Wasley (2005) show that using a control sample and matching on ROA reduces misspecification, the model used in this paper performs better than most models presented in Kothari, Loene and Wasley (2005). We use the current model because using a control sample to match on ROA inherently assumes that the control sample does not engage in earnings management. It is unclear that this is an accurate assumption.

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