

**Insiders' Informative Trading:  
Evidence from Multi-company Directors**

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**ABSTRACT**

This paper examines the “relative” information contained in insider director transactions. We find that insider transactions of multi-company directors reflect superior information about future relative returns; that is, directors are more likely to buy (sell) stocks of firms they direct that have better (worse) future returns. Examining related issues, we find weak support that December tax loss selling reduces the informativeness of directors' sales, that directors' private information includes but exceeds their superior knowledge of a company's future earnings realizations, and that the busyness of directors affects their informativeness, especially in regards to selling.

*JEL classifications:* G11; G14; G34

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Since corporate insiders are only required to disclose the stock trading activities of companies in which they function as insiders while the trading activities of other stocks in their portfolio are not available to the public, prior studies on insider trading, which rely on a single stock perspective, may yield a partial picture of the real motives behind insiders' stock trading decisions. This paper utilizes the insider transactions of directors serving multiple companies, whom we refer to as "multi-company directors", to evaluate insider trading motives.

For multi-company directors who are privy to private information on multiple companies, certain questions emerge, which have been largely unaddressed in the previous literature. How do directors select stocks to buy or sell among all the stocks for which they have private information? Do transactions of traded stocks also contain information about untraded stocks? This paper addresses these questions, jointly considering traded and untraded stocks.

Specifically, we use a fixed-effect logit framework to model directors' trading decisions among all the directed stocks as the dependent variable. We find that private information plays an important role in directors' selection of stocks to trade. That is, directors are more likely to buy (sell) stocks of directed firms that have better (worse) future returns. We confirm the conclusions of previous papers concerning the preferences of directors to purchase smaller value stocks that have experienced previous price declines and to sell larger growth stocks that have experienced previous price appreciations. We find that company-level insider-trading restrictions depress both director sales and purchases while stocks with earnings announced within one month are

more likely to be traded. Finally, we show that directors' rebalancing and diversification motives do not affect either director purchases or sales.

Our results are robust to various horizon selections. Using an alternative specification, we find that the direction of insider trading partially explains future stock returns. Examining related issues, we find some support for December tax loss selling reducing the informativeness of directors' sales. We find that directors' private information includes but exceeds their superior knowledge of companies' future earnings realizations. We document that busyness reduces directors' informativeness.

Unlike previous studies, our empirical approach explicitly considers the joint trading decisions of insiders, enabling us to provide a cleaner test of the motives behind insider trading, including the use of private information. For example, since the trading decisions of multi-company directors reflect the joint information set spanning all the directed companies, we are better able to capture private information incorporated in insider transactions.

Our approach allows us to also control more effectively for factors that affect trading. Although insiders' trading can be motivated by factors other than information advantages, it is not easy to control for all of these factors. For example, although insiders' current stock holdings, their recent receipt of stock and option grants, and their stock option exercising can proxy for rebalancing and diversification needs, it is more difficult to proxy for personal liquidity needs. However, in our setting, we can ignore individual-level attributes such as liquidity needs because we examine the joint and contemporaneous trading decisions of a given director. Thus, even if insiders sell stocks

to raise liquidity, their trades, if informative, should still reflect the relative future performance of the stocks they sell relative to the stocks they choose not to sell.

Our study contributes to the literature in several ways. First, we approach insider informativeness from a different perspective. Unlike previous studies that analyze the “absolute” information contained in insider transactions, we examine “relative” information contained in insider transactions. We find that the insider transactions of directors serving multiple companies reflect their information advantage concerning future relative returns. Putting it differently, multi-company director transactions provide significant value-relevant information regarding the relative future performance of several stocks.

Our results also have significant implications for the corporate director literature. In order for corporate directors to be effective monitors, they need to be informed monitors. However, it is an open question whether board directors, especially independent board directors, are sufficiently informed. In practice, directors often claim to have been poorly informed or misled by managers in the wake of exposures of corporate frauds or governance failures.<sup>1</sup> Ravina and Sapienza (2006) are among the first to study the informativeness of independent directors in a systematic manner using insider transactions. They report that independent directors are informative, earning positive and substantial abnormal returns when they purchase their own company’s stock. Using independent directors serving multiple companies, we offer additional evidence that multi-company independent directors, on average, are informative.

We organize the remainder of this paper as follows. Section I explores the literature and develops our hypotheses. Section II describes our data and sample characteristics.

Section III contains our main empirical results on directors' use of private information in trading. Section IV examines three related issues and Section V concludes.

## **I. Hypotheses Development**

Directors have various motives to trade the stock of companies in which they function as insiders. In this section, we discuss insider trading motives and factors that may affect director trading decisions.

### *A. Private Information*

Whether insiders trade on the basis of superior inside information is the subject of many studies. Early studies generally conclude that insider trades outperform market benchmarks. For example, Jaffe (1974) reports a larger than five-percent cumulative residual return<sup>2</sup> eight months following intensive insider trading months. Finnerty (1976) documents a significantly positive (negative) monthly excess return for insider-purchase (sell) portfolios for up to 11 months following insider transitions during the sample period 1969 to 1972. Using a sample of insider transactions over the period from 1975 to 1981, Seyhun (1986) shows that the average risk-adjusted gain is 4.3 percent for insider purchases and -2.2 percent for insider sales over 300 days subsequent to trades and that most of the gains occur during the first 100 days.

More recent studies document mixed results about the informativeness of insider trades, especially insider sales. Due to the complicating effects of various motives such as insiders' diversification and liquidity needs, many recent studies find insignificant or

only marginally significant results for insider sales. For example, Jeng, Metrick, and Zeckhauser (2003) find a one-year holding period return of 40 basis points per month for insider purchases between 1975 and 1996, but an insignificant one-year holding period return for sales. Lakonishok and Lee (2001) also document that there is informativeness in insider purchases, while insider selling appears to have no predictive ability. Jenter (2005) finds little evidence that managers use valid inside information in their trades. Specifically, he documents that the excess returns to insider trades after controlling for size and book-to-market effects are indistinguishable from zero.

Prior studies indicate that independent directors may not be as informed as executives. For example, Seyhun (1998) suggests an “information hierarchy” among insiders, with top executives at the top, other officials in the middle, and directors at the bottom. Ravina and Sapienza (2006) document that when independent directors purchase their company’s stock, the difference in abnormal returns between independent directors and the same firm’s officers is relatively small at most horizons. However, they show that the gap between executive officers and independent directors widens in firms with weaker governance.

In this paper, we analyze directors’ decisions to purchase and sell certain stocks they direct relative to other stocks they also direct. Multi-company directors, explicitly or implicitly, make trading decisions based on private information concerning the set of companies they direct. In other words, viewing other stocks as potential alternatives, multi-company directors will bear substantial opportunity costs if these stocks turn out to be better choices to buy or sell. Therefore, we hypothesize that directors will utilize

superior private information to purchase (sell) stocks that will experience higher (lower) future excess returns.

### *B. Other Motives and Factors*

While, as noted above, the multi-company director framework enables us to bypass some individual-specific attributes such as liquidity needs and personal wealth, we still need to include many choice-specific factors that contribute to a director's trading decision.

#### *B.1. Rebalancing and Diversification Needs*

Diversification motivates multi-company directors to sell (purchase) shares in firms in which they hold a large (small) amount of stock. Thus, we expect current stock holdings to be positively (negatively) related to directors' selling (buying) decisions.

From a dynamic perspective, stock awards or the exercise of stock options might increase directors' holdings past the point of optimality, thereby, providing an incentive to sell stocks. Consistent with this notion, Ofek and Yermack (2000) report that although equity compensation increases incentives for lower-ownership managers, higher-ownership managers negate much of this impact by selling previously owned shares. In addition, when executives exercise options to acquire stock, they sell nearly all of their shares. Therefore, we control for the recent increases in directors' stock ownership that are beyond their influence.

#### *B.2. Insider Preferences and Mechanical Trading Rules*

Prior studies find that insider preferences for particular types of stocks or for particular types of mechanical trading rules can explain certain documented patterns of insider trading. First, firm size affects insiders' trading decisions. Seyhun (1986) and Rozeff and Zaman (1988) find that insiders prefer purchasing the stocks of small companies.

Second, other studies report that insiders prefer value stocks. For example, using the ratio of cash flow per share to earnings per share to differentiate value and growth companies, Rozeff and Zaman (1998) discover that insider buying increases as stocks change from growth to value categories. Lakonishok and Lee (2001) find that although they predict market movements better than simple contrarian strategies, insiders in aggregate are contrarian investors. Jenter (2005) also suggests that top managers have contrarian views on firm value. He finds that managers in firms with low market valuation relative to book equity, earnings or cash flow tend to view their firm as undervalued and actively purchase additional shares for their private accounts. In contrast, managers in high valuation firms sell a larger amount of equity than predicted by their level of equity ownership, compensation grants, and recent stock price history.

Finally, prior stock performance may also affect insider trading decisions. For example, Seyhun (1992) documents that insiders are more likely to sell (purchase) shares following periods of significant price appreciation (declines). Rozeff and Zaman (1998) also report that insider buying is greater after low stock returns, and lower after high stock returns. We expect these preferences to be reflected in multi-company directors' trading decisions.

### *B.3. Insider Trading Restriction Policies*

Corporations often implement policies and procedures to regulate the trading of stock by insiders. Bettis, Coles and Lemmon (2000) find that the blackout period, the period during which a company prohibits trading by its insiders, successfully suppresses insider trading for both purchases and sales. Following Roulstone (2003), we use a 30-day trading window to proxy for such insider trading restriction policies. The underlying assumption is that trading is more likely to occur during the 30-day period following earnings announcements for firms with insider trading restrictions. Similarly, firms without insider trading restrictions are more likely to exploit private information by trading outside the restricted window, especially before earnings disclosures.

## **II. Data and Sample Characteristics**

### *A. Data and Sample Collection*

We collect our sample from the Thompson Financial's TFN Ownership dataset. The sample collection process involves two steps: (1) collect the open market and private purchases and sales made by independent directors; (2) classify each transaction event as a transaction made by multi-company directors or single-company directors. Only transaction events associated with multi-company directors remain in the sample.

### *A.1. Director Transactions*

We collect the open market and private purchases and sales made by independent directors<sup>3</sup> reported on TFN Table 1 of Form 4<sup>4</sup> from 1996 to 2003.<sup>5</sup> We define independent directors as directors who are directors but not at the same time executives of the company. Following prior literature, we delete other types of insider trades such as those related to grants of stocks or options because they are not at the directors' discretion and are generally ignored by prior insider trading studies. For the sample period, there are 287,998 common stock transactions with a transaction value greater than \$1,000 made by all independent directors. After deleting problematic records<sup>6</sup> and filings that represent an amendment to a previous filing, 274,850 transactions remain. To avoid double counting the event date, we combine the multiple records representing trading in the same direction associated with the same person for the same stock on the same date into one record. We then delete records which indicate that a director buys and sells the same stock on the same day. The resulting sample includes 180,909 transaction events, including 81,509 purchase events and 99,400 sale events.

### *A.2. Insider Trading by Multi-company Directors*

Previous studies examining directors serving on multiple boards usually begin with a sub-sample of companies, such as those belonging to the Forbes 500 as in Fich and Shivdasani (2006), and identify such directors by reading a company's 10-K or proxy statements. To construct a sample from a broader pool of companies we adopt an

alternative approach using the TFN database.

Insiders are required by law to file Form 3 when they become officers, directors, or beneficial owners, and Form 4 when their ownership changes. Insiders must also file Form 5 to report any transactions that should have been reported earlier on Form 4 or were eligible for deferred reporting. TFN data includes all the records in these forms, and, more importantly, assigns a unique identifier to each individual insider. Therefore, we are able to use the TFN database to accurately identify our sample of multi-company directors.

Specifically, we first obtain all the unique director-company pairs over the 1986-2005 period<sup>7</sup> from TFN's Tables 1 and 2 insider trading files.<sup>8</sup> Then, we obtain the transaction dates for the first and last records associated with each director-company pair in the database, assuming that insiders remain as such during the period between these two dates. Starting with 14,203,699 records in the TFN insider files, we identify 149,060 unique directors associated with 21,813 unique companies. 34,860 of these unique directors are associated with multiple companies while the remaining 114,200 are associated with only one company.

Table I provides a rough illustration of the yearly distribution of insiders, multi-company insiders, directors, and multi-company directors.<sup>9</sup> The numbers of both insiders and directors increase until the late nineties, and then decline to their early-nineties levels. During 1996-2003, the percentage of multi-company insiders among all the insiders ranges from 11 percent to 15 percent, while the percentage of multi-company directors among all the directors is a little higher, varying from 16 percent to 18 percent.

**Insert Table I about here.**

After obtaining all the unique director-company pairs and their starting and ending dates, we revert to director transactions as collected in section 3.1.1. We compare the transaction date with the starting and ending dates of each company-director pair associated with the same director. Specifically, if the transaction date is between the starting and ending dates of at least two company-director pairs, we classify it as a multi-company director trade, and only transactions made by multi-company directors remain in our sample. Our preliminary sample regarding director purchases includes 68,348 observations: 23,656 are purchased stocks and 44,692 are control stocks.<sup>10</sup> Our preliminary sample regarding director sales contains 72,861 observations, including 26,257 sold stocks, and 46,604 control stocks. On average, the buying (selling) directors are directors on 2.89 (2.77) stocks. Over the same period, there are 57,853 purchases and 73,143 sales made by single-company directors.

## *B. Variables*

### *B.1. Informational Motives of Insider Trading*

We calculate the buy and hold Carhart (1997) four-factor adjusted abnormal returns over the six-month period following insider trades and designate this return as *Ret.*<sup>11</sup> We use a six-month horizon due to the short-swing rule of insider trading (Section 16b of the Securities Exchange Act), which prohibits insiders from selling (buying) within the six months after they buy (sell) the stock.

## *B.2. Other Control Variables*

Motivated by the discussion in Section I, we include the following control variables that affect director trading.

*Holdings*: the number of shares held by directors the day before director transactions, scaled by the total number of shares outstanding (in thousands). We obtain director holdings data from TFN, and the total number of shares outstanding from CRSP.

$\Delta$ *Holdings*: the total increase in director stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before directors' transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to transaction dates. We obtain directors' transaction records up to one year prior to the transaction dates from TFN and sum all the increases in stock ownership except those occurring through open market and private purchases and sales as the total increase in directors' stock holdings.

*Size*: the natural logarithm ( $\ln$ ) of the market value (Compustat annual item 199\*25) of the company at the end of the previous month.

*B/M*: the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat annual item 60) and market value (Compustat annual item 199\*25) from the Compustat database.

*PriorRet*: the raw buy and hold stock return over the six-month period prior to the director trades. *PriorRet* captures the price appreciation of the stock in the past six months.

*Restrict*: the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003). Specifically, we gather all the open market transactions and option exercises of officers and directors in TFN,<sup>12</sup> and merge the trades with the quarterly earnings announcement dates in Compustat. If a trade occurs within the one-month period after the earnings announcement date, then we classify it as a trade within the allowed trading window. Following Roulstone (2003), we classify a company as having insider trading restriction policies and assign *Restrict* value one if the percentage of shares traded during the allowed trading window is greater than 75 percent<sup>13</sup>.

*Earnings*: a dummy variable indicating whether the trade is within 30 days following the quarterly earnings announcement date. We set *Earnings* to one if the trade is within 30 days of an earnings announcement, and zero otherwise.

### *B.3. Sample Characteristics and a Comparison with Single-company Directors*

To be in the final sample, observations must contain the variables described above. Since directors cannot short sell, we require them to hold shares of the unsold firms. We eliminate observations containing negative book values.

Table II presents our sample characteristics. Our final sample for 1996-2003 contains 48,804 observations, including 9,695 insider purchases with 14,168 corresponding controls, and 10,588 insider sales with 14,353 corresponding controls. There are 3,816 unique multi-company directors representing 3,931 unique companies including 3,004 unique companies that are actually traded by the directors. On average, directors in the purchase (sale) sample own 2.74 (2.56) stocks.

**Insert Table II about here.**

In Table II, we also compare multi-company directors with single-company directors along various dimensions such as company size and transaction value. In the TFN insider trading database over the same period, there are 20,602 unique single company directors representing 5,843 unique companies. Companies associated with multi-company directors are larger, with greater director transaction sizes and share values than those associated with single-company directors, and higher three-day and six-month buy and hold four-factor adjusted abnormal returns (Carhart (1997)) following director transactions. Therefore, we need to be cautious when generalizing our results to the informativeness of transactions made by single-company directors, especially those representing small companies and making small transactions.

### III. Director Trading Decisions

#### *A. Variable Comparisons for Traded and Untraded Stocks*

In this section, we test for differences between traded and untraded stocks for variables that explain directors' trades and report our results in Table III. When there is more than one corresponding untraded firm, we average the untraded firm values.<sup>14</sup>

**Insert Table III about here.**

Consistent with our hypothesis that directors' trades contain information about future stock performances, the average six-month buy and hold four-factor adjusted abnormal returns for traded stocks are 12.49 percent higher for director purchases, and 15.39 percent lower for director sales relative to non-traded stocks. We also find that directors' holding levels and recent increases in holdings are generally larger for traded stocks than for untraded stocks. As expected, the purchased (sold) stocks have a significantly higher (lower) B/M ratio than the not-purchased (not-sold) stocks, and the purchased (sold) stocks are smaller (larger)-sized. Prior returns are significantly lower for purchased stocks and significantly higher for sold stocks than for control stocks. *Restrict* is significantly lower, and *Earnings* is significantly higher for traded stocks than for untraded stocks.

#### *B. Fixed-effect Logit Model*

In this section, we examine the information content of directors' transactions in a multivariate framework using the fixed-effect logit model.<sup>15</sup> Specifically, we treat as exogenous the timing of insider transactions and analyze the insider trading decisions of

multi-company directors. In our setting, for each stock in portfolio, directors decide whether to sell or not to sell (to purchase or not to purchase). This empirical design provides a naturally matched sample of directors' decisions by observing the sell/purchase choice relative to the natural control of the not-sold/not-purchased stocks.

We let  $SELL_{i,t}$  equal one if stock  $t$  is sold by director  $i$ , and zero otherwise.

Similarly,  $BUY_{i,t}$  equals one if stock  $t$  is purchased by director  $i$ , and zero otherwise. We estimate the following model:

$$P_{i,t} = G(\alpha_i + \beta' X_{i,t}) + e_i \quad (1)$$

where  $P_i = SELL_{it}$  or  $BUY_{it}$ , that is, the trading decision made by director  $i$  for stock  $t$ ,

$\alpha_i$  is the unobserved individual-level heterogeneity,  $\beta' X_{i,t} = f(Ret, Holdings,$

$\Delta Holdings, B/M, Size, PriorRet, Restrict, Earnings, Restrict * Earnings)$ , and  $G$  is the

CDF of the logistic distribution such that  $G(\beta' X_{i,t}) = \frac{1}{1 + EXP(-\beta' X_{i,t})}$ .

We estimate the model using the conditional maximum likelihood estimator. In a nonlinear framework, it is not possible to sweep out the unobserved heterogeneity by taking differences or deviations from group means (see, e.g., Greene (2000) and Wooldridge (2001)). Thus, we use Chamberlain's method where the conditional maximum likelihood does not depend on the unobserved heterogeneity and we can produce both consistent and efficient estimates despite the presence of unobserved heterogeneity. However, the marginal effect is not available since one cannot plug in the individual unobserved heterogeneity, whose distribution is unrestricted.<sup>16</sup> Since our framework allows directors to enter the sample multiple times, introducing possible

clustering in the sample, we report clustering-robust standard errors to avoid potential overestimating of the z-statistics.

We summarize our empirical results in Table IV. Column 1 estimates Model (1) with the informational motive *Ret* along with other control variables as independent variables. Columns 2 and 3 report the estimated coefficients of the buy and hold four-factor adjusted abnormal returns over the nine-month and twelve-month period, respectively, following insider transaction dates as *Ret*. We report the estimated coefficients  $\hat{\beta}$ , whose sign indicates the expected direction of the effect of the independent variables on the director's trading choice.<sup>17</sup> Panel A reports results for purchase decisions, while Panel B reports results for selling decisions.

**Insert Table IV about here.**

We find evidence of the informational motive underlying director trades. Regardless of how *Ret* is specified, estimated coefficients on purchases are significantly positive, consistent with directors using private information about valuation to make purchasing decisions. Estimated coefficients of the *Ret* variables on sales are significantly negative for all specifications except the four-factor adjusted returns over the twelve-month window, indicating that director sales transactions also appear to be based on private valuation information.

The results for other motives and controls are largely consistent with previous literature. For example, we confirm the conclusions of previous papers concerning the preferences of directors to purchase smaller value stocks that have experienced previous price declines and to sell larger growth stocks that have experienced previous price appreciations.

We find that company-level insider-trading restrictions, designated by *Restrict*, depress both director sales and purchases while stocks with earnings announced within one month are more likely to be traded. The estimated coefficients of the interaction term between *Restrict* and *Earnings* is significantly positive for both purchase and sales, suggesting that directors in companies with insider trading restrictions are more likely to trade within the trading window after earnings announcements.

Directors' rebalancing and diversification motives do not affect director purchases or sales. This can be seen by observing that the coefficients on holdings and changes in holdings are both insignificant.

Our results concerning the effect of private information on directors' trading might be surprising from another perspective. Since large companies are usually more visible and followed by more analysts than small companies, one would expect insiders in these companies to have few information advantages. Many previous studies on insider trading confirm this perception and document little evidence of insider trading informativeness for large companies. For example, Lakonishok and Lee (2001) find that insiders' ability to predict cross-sectional stock returns is confined to smaller firms. Table 2 shows that our sample is mostly comprised of large companies but transactions by directors of these large firms are still informative. These results are consistent with Jeng, Metrick, and Zeckhauser (2003) who find, from a performance evaluation perspective, that abnormal returns to insider trades in small firms are not significantly different from those in large firms.

## *C. Robustness Checks*

### *C.1. Sub-period Evidence*

To determine whether our results are driven by a specific time period, we divide our sample period into three sub-periods: 1996-1997, 1998-2000, and 2001-2003, rerun Model (1) for each sub-period and present our results in Table V Panel A. Although market returns are quite different across these three sub-periods, our main results hold for each.

**Insert Table V about here.**

### *C.2. Directors' Trading Information Set*

In this section, we test whether directors' informative trading is based solely on public information. To measure public information release, we construct an additional variable *Turnover*, the daily trading volume less the number of shares traded by directors scaled by the total number of shares outstanding. Table V Panel B shows that directors are more likely to sell but not to purchase stocks with higher *Turnover*. Since outsiders are unaware of the timing of directors' trades, there is little chance of directors' trades causing selling volume. Therefore, these results are consistent with public information influencing directors' sales. Nevertheless, other independent variables including *Ret* remain unchanged after the inclusion of *Turnover*, suggesting that public information is not the sole source for directors' informative sales.

### *C.3. Director Trading as a Predictor of Future Stock Returns*

In this section, we modify the empirical model to determine whether director trading predicts future stock returns. Specifically, we adopt a fixed-effect model with director effect fixed, long-term abnormal returns as the dependent variable, and directors' trading decisions along with other control variables as independent variables. Our inferences are based on the cluster-robust standard errors. We report these results in Panel C of Table V. We document that the direction of insider trading can provide additional information about future stock returns. For example, stocks that are bought (sold) by directors experience a seven (seven) percent higher (lower) four-factor adjusted return over the six-month period following insider trading.

## **IV. Related Issues**

In this section, we examine three related issues: (A) the effect of December tax loss selling on the informativeness of director trading, (B) future accounting earnings realizations as the source of directors' private information, and (C) the busyness effect on director informativeness.

### *A. December Tax Loss Selling*

When there is December tax loss selling, we expect some selling to result from private information about lower returns and some due to the fact that there are lower prior returns. We do not expect purchases to be impacted by a December effect.

To formally test our tax loss selling hypothesis, we introduce a set of dummy variables to interact with our return variables:

If the trade occurs in December,  $Dec=1$  and  $NotDec=0$ ;

If the trade does not occur in December,  $Dec=0$  and  $NotDec=1$ .<sup>18</sup>

To confirm the loss of informativeness, we expect that relative to sales the interaction of  $Ret$  and  $Dec$  will be less negative and the interaction of  $Priorret$  and  $Dec$  to be less positive. Table VI reports mixed and weak evidence of a tax loss effect since  $Ret*Dec$  is insignificant (consistent with tax loss effect) but  $Priorret*Dec$  continues to be positive (inconsistent with tax loss effect) for director sales and the interactive coefficients involving  $Dec$  and  $NotDec$  are not statistically different from each other.

**Insert Table VI about here.**

#### *B. Future Accounting Earnings Realizations as the Source of Private Information*

Directors' informativeness regarding valuation may be obtained from a variety of sources. There is a large body of literature relating insider trades and future earnings. For example, Elliott, Morse, and Richardson (1984) find that insiders increase (decrease) purchases (sales) in the twelve months before extreme earnings increases but find little evidence that insiders sell in advance of extreme earnings decreases, dividend changes, or bond rating changes. Ke, Huddart, and Petroni (2003) document that insider sales increase in the year before a firm experiences a break in consecutive quarterly earnings increases. Piotroski and Roulstone (2005) also find that insider trades are positively associated with future earnings performances and conclude that insiders' trade on both transitory security misvaluation and private information about future cash flow payoffs.

In this section, we examine the relation between directors' trades and future earnings innovations. We hypothesize that if directors exploit any superior information about a company's future earnings, they will sell the stock with the worst future earnings innovations and purchase the stock with the best future earnings innovations. Further, if directors' informativeness derive mainly from superior knowledge about future earnings innovations, we would expect future stock returns to lose explanatory power to explain purchase and sell decisions after controlling for companies' future earnings innovations in our regressions.

We follow the methodology of Piotroski and Roulstone (2005) in constructing two future earnings innovation variables. First,  $\Delta ROA1$  is the next fiscal year's annual earnings innovation:  $\Delta ROA1 = ROA_{t+1} - ROA_t$ , where  $ROA_t$  equals the net income before extraordinary items (Compustat annual item 20) scaled by total assets in year  $t$  (Compustat annual item 6). Second, contemporaneous annual earnings innovation ( $\Delta ROA2$ ) is defined as  $\Delta ROA2 = ROA_t - ROA_{t-1}$ . Year  $t-1$  refers to the most recent fiscal year that has ended prior to director transactions. Both  $ROA_t$  and  $ROA_{t+1}$  are unknown at the time of director transaction.

We use a fixed-effect logit to estimate this model and report results in Table VII.<sup>19</sup> The estimated coefficient of  $\Delta ROA2$  is significantly positive at the one percent level for director purchases, indicating that directors' informativeness concerning contemporaneous annual earnings innovations impacts purchasing decisions. The variable  $Ret$  continues to be significantly positive but  $\Delta ROA1$ , next fiscal year's annual earnings innovations, is not. Neither  $\Delta ROA1$  nor  $\Delta ROA2$  is a factor in director sales although  $Ret$  continues to be significantly negative. The fact that  $Ret$  continues to be a

significant factor in explaining both director sales and purchases after controlling for earnings innovations suggests that directors' informativeness incorporates more than just future accounting innovations.

**Insert Table VII about here.**

### *C. Busyness Effect on Directors' Informativeness*

There is a growing body of literature regarding the effect of multiple directorships on corporate governance. "Busy" directors may be too busy to do their jobs adequately, thereby, lowering the effectiveness of board monitoring. However, considering that the appointments of directorships are positively correlated with directors' reputation capital in the labor market (Fama and Jensen (1983)), busy directors might be more capable directors. The empirical evidence on whether busy directors are effective monitors is mixed. For example, Fich and Shivdasani (2006) find that busy outside directors are associated with weak corporate governance. On the other hand, Ferris, Jagannathan, and Pritchard (2003) find no evidence that multiple directors shirk their responsibilities to serve on board committees.<sup>20</sup>

To compare the informativeness of busy directors with other multi-company directors, we introduce a set of dummy variables to interact with our return variables:

If a director holds more than two stocks at the time of the transaction,

*Busy*=1 and *Notbusy*=0;

If a director does not hold more than two stocks at the time of the transaction,

*Busy*=0 and *Notbusy*=1;

Forty percent of our sample is associated with transactions made by busy directors.

We test the difference between busy and nonbusy directors by introducing the interaction terms *Ret\*Busy* and *Ret\*Notbusy* and report results in Table VIII. The coefficient of *Ret\*NotBusy* is significantly negative for director sales, but the coefficient of *Ret\*Busy* is not significant, indicating that director sales by busy directors are not informative. However, the two coefficients are not significantly different from each other.

**Insert Table VIII about here.**

The asymmetry between director sales and purchases is also present. The coefficients of *Ret\*Busy* and *Ret\*Notbusy* are both significantly positive at the 1% level for director purchases. The asymmetry between the informativeness of director sales and director purchases by busy directors is not surprising given that managers are more likely to voluntarily share with directors good news than bad news. With binding time constraints, busy directors are less likely to uncover bad news for themselves.

## **V. Conclusion**

This paper utilizes the insider transactions of directors serving multiple companies, whom we refer to as “multi-company directors”, to evaluate insider trading motives. We find that private information plays an important role in directors’ selection of stocks to trade: directors are more likely to buy (sell) stocks of firms they direct that have better (worse) future returns. We also confirm the conclusions of previous papers concerning the preferences of directors to purchase smaller growth stocks that have experienced previous price declines and to sell larger growth stocks that have experienced previous price appreciations. We find that company-level insider-trading restrictions depress both director sales and purchases while stocks with earnings announced within one month are

more likely to be traded. However, we show that directors' rebalancing and diversification motives do not affect director purchases or sales,

Our results are robust to various horizon selections. Using an alternative specification, we find that the direction of insider trading partially explains future stock returns. Examining related issues, we find some support for December tax loss selling reducing the informativeness of directors' sales. We find that directors' private information includes but exceeds their superior knowledge of a company's future earnings realizations. We document that busyness reduces directors' informativeness.

Our study provides a new perspective on the issue of insider informativeness by documenting the "relative" information contained in insider transactions made by multi-company directors, which may have significant value-relevant implications for investors. In addition, we show that independent directors serving multiple companies, on average, are informative, complementing Ravina and Sapienza (2006)'s finding about independent directors informativeness.

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<sup>1</sup> For example, in 2004, several Hollinger directors claimed that they were misled by executives in the wake of the exposure of some controversial transactions benefiting management at the expenses of shareholders. Indeed, according to the company's investigation overseen by former Securities and Exchange Commission Chairman Richard Breeden, the board "wasn't fully and accurately" informed about a range of issues. (See "Paper Tigers -- Lord Black's Board: A-List Cast Played Acquiescent Role; Hollinger's Directors Blessed Fees Now Under Scrutiny; Some Say They Feel Misled; Kissinger Tries Negotiating", The Wall Street Journal, Robert Frank and Elena Cherney, Sep. 27, 2004, pg. A.1)

<sup>2</sup> Jaffe defines the mean cumulative residual return over all securities in the sample as the sum of residual returns following insider purchases minus the sum of residual returns following insider sales.

<sup>3</sup> Since prior literature generally documents that information is not distributed uniformly across different types of insiders, we limit our sample to insiders that serve as directors but not as officials at the same time to control for the different roles of insiders. That is, our sample directors consist of independent director, but may also include grey directors.

<sup>4</sup> Insiders report their changes in ownership to the SEC on Form 4. On Table 1 of this form, insiders report non-derivative securities acquired, disposed of, or beneficially owned. On Table 2, insiders report derivative securities acquired, disposed of, or beneficially owned, such as puts, calls, warrants, and convertible securities.

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<sup>5</sup> We start our sample period from 1996 because we can retrieve few insider transactions made by independent directors before 1996. For example, our initial data collection process yields 11 purchases in 1990, 10 in 1991, 20 in 1992, 39 in 1993, 112 in 1994, 1,002 in 1995, but as many as 9,890 in 1996. The number of purchases is then stable within the 9,217-17,279 range after 1996. Thomson as a company did not begin collecting data internally previous to 1997. To supply a more robust historical data set Thomson purchased data from 1986-1997 and then backfilled and loaded the database. Although transactions in 1996 and 1997 are also backfilled, we keep them in our sample since starting from 1996 the distribution of insider transactions is already even. In a later robustness check, we examine year 1996 and 1997 separately, and the results are similar to those obtained from other period.

<sup>6</sup> Specifically, we delete records with cleanse code “A” or “S”. TFN makes systematic interpretations on the accuracy of as-reported data. The cleanse code denotes the overall level of confidence of TFN in each record. Records with cleanse code “A” have numerous missing or invalid data elements. The attempt to cleanse was not completed for these records due to the fact that the data could not be fixed under reasonable assumptions. Cleanse code “S” indicates that no cleansing was attempted and the security does not meet TFN’s collection requirements.

<sup>7</sup> We use the TFN internal company number to identify each company, and the TFN person ID to identify each insider. Although the sample period for our formal tests is from 1996 to 2003, we use the insider filings from a much longer period to capture more insider-company relations.

<sup>8</sup> Forms 3, 4, and 5 each contain two tables: Tables 1 and 2. The Table 1 file starts in 1986 and contains the holdings and tradings of non-derivative securities beneficially owned while the Table

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2 file starts in 1996 and contains open market derivatives transactions as well as information on the award, exercise, and expiration of stock options.

<sup>9</sup> Directors may be associated with multiple companies consecutively rather than simultaneously. In Table 1, we count the number of companies an insider holds or trades each calendar year to address this issue and to more accurately represent the occurrence of multi-company directors in the sample.

<sup>10</sup> For example, assume a director serving on boards of company A, company B, and company C then buys stock A on April 10, 1999. This purchase transaction would add 3 observations to the sample, which share the same event date: April 10, 1999. Stock A would be the purchased stock, while Stock B and Stock C would be the control stocks.

<sup>11</sup> We include day 0, the insider transaction date, in our main analyses. In unreported tests excluding day 0, the results are not changed.

<sup>12</sup> Roulstone (2003) uses the CDA/Investnet database, another database that contains insider trading data.

<sup>13</sup> See Roulstone (2003) (p.532) for the rationale of choosing 75 percent as the cut-off point.

<sup>14</sup> For a robustness check, we compare the traded firm with each untraded firm and find similar results.

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<sup>15</sup> The fixed-effect logit model is similar to a conditional logit model although with multiple cases matched with multiple controls.

<sup>16</sup> See Wooldridge (2001) (p.490) for a detailed discussion concerning the fixed-effect logit model.

<sup>17</sup> While marginal effects are not available in fixed-effect logit models, to provide a feel for the magnitude of the marginal effects, we adopt the logit model with the same dependent and independent variables and obtain the estimated coefficients and marginal effects. We find that a one percent increase in Ret from the mean (four percent) is associated with a .07 percent decrease in the probability to sell, and a one percent increase in Ret from the mean (nine percent) is associated with a .09 percent increase in the probability to buy, when all the other variables are at their mean.

<sup>18</sup> It is important to remember that the traded and untraded firms share the same time stamp due to the way we created the sample. For example, suppose Director A is a director for companies X, Y, and Z. If she sells X in December, then we compare X, Y, and Z in December and there would be no variation with regards to a December dummy variable.

<sup>19</sup> Since the insiders in our sample are restricted to non-official directors who cannot manipulate earnings as can executives, our results are less likely to be driven by potential earnings management.

<sup>20</sup> See Fich and Shivdasani (2006) for a through literature review on this issue.

**Table I**  
**Occurrences of Multi-company Insiders and Directors by Year**

This table identifies insiders' multi-company associations using the Table 1 and Table 2 insider trading files of the Thomson Financial Database (TFN) over the 1986-2005 period. Column (1) contains the number of unique insiders each calendar year, and column (2) contains the number of insiders who are associated with multiple companies each year. Column (2)/(1) reports the percentage of multi-company insiders each year. Column (3) contains the number of unique non-official directors each year. Column (3)/(1) reports the percentage of directors among all types of insiders. Column (4) contains the number of multi-company directors and column (4)/(3) reports the percentage of multi-company directors among all the directors. The shaded area represents the sample period (1996-2003) for our formal analyses.

Year	Number of Insiders (1)	Number of Multi-company Insiders (2)	(2)/(1)	Number of Directors (3)	(3)/(1)	Number of Multi-company Directors (4)	(4)/(3)
1986	29433	1542	5%	12602	43%	896	7%
1987	59058	5653	10%	25547	43%	3229	13%
1988	63503	6594	10%	27418	43%	3615	13%
1989	67240	7181	11%	29329	44%	3973	14%
1990	69952	7584	11%	31414	45%	4388	14%
1991	68460	7614	11%	30714	45%	4341	14%
1992	75316	8938	12%	34005	45%	5164	15%
1993	86155	10406	12%	38859	45%	5949	15%
1994	100308	13141	13%	44514	44%	7226	16%
1995	105032	14800	14%	46564	44%	8113	17%
1996	110052	16263	15%	48682	44%	8912	18%
1997	110998	16045	14%	47868	43%	8828	18%
1998	111286	15826	14%	47590	43%	8735	18%
1999	99959	13131	13%	43902	44%	7716	18%
2000	99659	12553	13%	43690	44%	7427	17%
2001	89998	10525	12%	40089	45%	6507	16%
2002	85495	9551	11%	38516	45%	6011	16%
2003	79721	8840	11%	35995	45%	5671	16%
2004	77030	9023	12%	34525	45%	5798	17%
2005	69319	8040	12%	30851	45%	5183	17%

**Table II**  
**Sample Characteristics and a Comparison with Single-company Directors**

This table presents our sample characteristics for 1996-2003. Columns labeled as “P” contain statistics of director purchases, and columns labeled as “S” contain statistics of director sales. In the column labeled as “Dif (1)-(2)”, we report the t-statistics from the t-test for the difference in means for two independent samples with unequal variances, and z statistics from the Wilcoxon rank-sum test for the difference in medians. We measure company size as the ln of the market value of the company at the end of the previous month. We also report the firm’s CRSP stock file market capitalization decile. CRSP ranks all the NYSE companies by capitalization, divides them into 10 equally populated portfolios, and then places Amex and Nasdaq stocks into each NYSE cap decile. Stocks with the largest capitalizations are in decile 10, and those with the smallest are in decile 1. BHAR is the buy and hold return adjusted for the four-factor model.

	<u>Multi-company Directors</u>			<u>Single-company Directors</u>			<u>Dif.</u>	
	ALL	<u>(1)</u>		ALL	<u>(2)</u>		<u>(1)-(2)</u>	
		P	S		P	S	P	S
Sample size:								
Traded	20,283	9,695	10,588	86,236	32,918	53,318		
Controls	28,521	14,168	14,353	0	0	0		
# of unique directors	3,816	2,730	2,048	20,602	11,562	11,522		
# of unique companies traded	3,004	2,239	1,654	5,843	4,524	4,380		
# of unique companies (traded and control combined)	3,931	3,302	2,709	5,843	4,524	4,380		
Company size (mean)		13.29	13.99		11.85	13.09	80.17	59.43
Capitalization decile (median)		7	9		5	8	75.78	60.47
# of stocks owned per insider (mean)		2.74	2.56		1	1		
# of shares traded in one transaction event (median)		2,625	10,000		2,000	8,125	30.43	24.88
Value of shares traded in one transaction event (median)		24,130	215,560		13,750	125,000	44.26	46.79
3-day BHAR (mean)		0.77	-0.20		0.73	-0.10	7.31	1.20
3-day BHAR (median)		0.07	-0.33		0.06	-0.37	5.79	2.29
6-month BHAR (mean)		4.48	-25.34		-1.26	-27.30	2.45	18.88
6-month BHAR (median)		-0.29	-16.03		-2.28	-16.85	6.14	22.01

### Table III

#### Comparisons of Variables Explaining Director Trades

This table tests for differences between traded and untraded stocks for variables that explain director trades. When there is more than one corresponding untraded firm, we average the untraded firm values. The sample includes purchases and sales performed by multi-company directors between 1996 and 2003. *Ret* is the buy and hold Carhart four-factor abnormal return over the six-month period following insider trades. *Holdings* represents the number of shares held by the director the day before the transactions scaled by the total number of shares outstanding (in thousands).  $\Delta Holdings$  equals the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before the insider transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date. *B/M* is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure *Size* as the ln of the market value of the company at the end of the previous month. *PriorRet* equals the raw buy and hold stock return over the six-month period prior to the trades. *Restrict* represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003). *Earnings* is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. We report the mean and median of the variables for the traded and untraded firms separately. P-values are based on t-statistics for means and an approximate z-statistic for a sum of ranks test under the hypothesis that the distributions are equal.

	Mean			Median		
	Traded	Untraded	Difference	Traded	Untraded	Difference
<u>Panel A: Purchases</u>						
<i>Ret (%)</i>	4.48	-8.01	12.49 <sup>***</sup>	-0.29	-6.63	6.34 <sup>***</sup>
<i>Holdings</i>	22.26	12.31	9.95 <sup>**</sup>	0.29	0.32	-0.03 <sup>***</sup>
$\Delta$ <i>Holdings</i>	1.45	1.24	0.21	0	0	0 <sup>***</sup>
<i>B/M</i>	0.68	0.56	0.12 <sup>***</sup>	0.51	0.46	0.05 <sup>***</sup>
<i>Size</i>	12.81	13.62	-0.81 <sup>***</sup>	12.54	13.51	-0.97 <sup>***</sup>
<i>PriorRet (%)</i>	-4.38	5.94	-10.32 <sup>***</sup>	-7.69	2.70	-10.39 <sup>***</sup>
<i>Restrict</i>	0.31	0.38	-0.07 <sup>***</sup>	0	0	0 <sup>***</sup>
<i>Earnings</i>	0.54	0.35	0.19 <sup>***</sup>	1	0	1 <sup>***</sup>
Number of observations	9695	9695		10100	10100	
<u>Panel B: Sales</u>						
<i>Ret (%)</i>	-25.34	-9.95	-15.39 <sup>***</sup>	-16.03	-6.61	-9.42 <sup>***</sup>
<i>Holdings</i>	19.05	9.28	9.77 <sup>***</sup>	1.29	0.42	0.87 <sup>***</sup>
$\Delta$ <i>Holdings</i>	2.66	0.89	1.76 <sup>***</sup>	0.06	0	0.06 <sup>***</sup>
<i>B/M</i>	0.39	0.53	-0.15 <sup>***</sup>	0.30	0.45	-0.14 <sup>***</sup>
<i>Size</i>	14.27	13.76	0.51 <sup>***</sup>	14.05	13.78	0.27 <sup>***</sup>
<i>PriorRet (%)</i>	35.48	14.07	21.42 <sup>***</sup>	18.65	6.12	12.53 <sup>***</sup>
<i>Restrict</i>	0.35	0.40	-0.05 <sup>***</sup>	0	0	0 <sup>***</sup>
<i>Earnings</i>	0.58	0.37	0.21 <sup>***</sup>	1	0	1 <sup>***</sup>
Number of observations	10588	10588		10899	10899	

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

**Table IV**  
**Private Information Effect on Trading**

This table reports estimates for the trading choice of insiders using Model (1) in a fixed effect logit model framework. The sample includes purchases (tested in Panel A) and sales (tested in Panel B) performed by multi-company directors between 1996 and 2003. Column 1 estimates Model (1) with both the informational motives and the control variables as the independent variables. *Ret* is the buy and hold Carhart four-factor abnormal return over the six-month period following insider trades. *Holdings* represents the number of shares held by the director the day before the transactions scaled by the total number of shares outstanding (in thousands).  $\Delta Holdings$  the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before the insider transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date. *B/M* is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure *Size* as the ln of the market value of the company at the end of the previous month. *PriorRet* equals the raw buy and hold stock return over the six-month period prior to the trades. *Restrict* represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003). *Earnings* is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. We test the robustness of Model (1) by varying the investment horizon in Column 2 and 3. Column 2 and Column 3 report the estimated coefficients of buy and hold four-factor adjusted abnormal returns (Carhart (1997)) over the nine-month and twelve-month period following insider transaction dates as *Ret*. We make inferences based on the cluster-robust standard errors.

	Predicted Sign	6-month (1)	9-month (2)	12-month (3)
<u>Panel A: Purchases</u>				
<i>Ret</i>	+	0.21***	0.09***	0.04**
<i>Holdings</i>	-	0.00	0.00	0.00
$\Delta$ <i>Holdings</i>	-	0.00	0.00	0.00
<i>B/M</i>	+	0.17**	0.18**	0.18**
<i>Size</i>	-	-0.22***	-0.22***	-0.22***
<i>PriorRet1</i>	-	-0.63***	-0.64***	-0.65***
<i>Restrict</i>	-	-1.16***	-1.16***	-1.16***
<i>Earnings</i>	?	0.52***	0.52***	0.52***
<i>Restrict*Earnings</i>	+	1.43***	1.43***	1.43***
# of obs	23863			
Pseudo R2		0.1580	0.1562	0.1554
log likelihood		-7006	-7020	-7027

Panel B: Sales

<i>Ret</i>	-	-0.20***	-0.07*	-0.01
<i>Holdings</i>	+	0.00	0.00	0.01
$\Delta$ <i>Holdings</i>	+	0.04	0.04	0.04
<i>B/M</i>	-	-0.85***	-0.87***	-0.89***
<i>Size</i>	+	0.22***	0.23***	0.23***
<i>PriorRet1</i>	+	0.67***	0.68***	0.71***
<i>Restrict</i>	-	-1.12***	-1.11***	-1.11***
<i>Earnings</i>	?	0.55***	0.55***	0.55***
<i>Restrict*Earnings</i>	+	1.43***	1.43***	1.42***
# of obs	24941			
Pseudo R2		0.2226	0.2211	0.2199
log likelihood		-6787	-6800	-6811

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

## Table V

### Robustness Checks

We test the robustness of Model (1) by partitioning the data into three sub-periods in Panel A. In Panel B, we control for public information release by adding an additional variable *Turnover*, the daily trading volume less the number of shares traded by directors scaled by the total number of shares outstanding. In Panel C, we use a fixed-effect framework with director-effect fixed to test whether the direction of insider transactions can explain future stock returns. The sample includes purchases and sales performed by multi-company directors between 1996 and 2003. *Ret* is the buy and hold four-factor adjusted abnormal return over the six-month period following insider trades. *Holdings* represents the number of shares held by a director the day before the transaction scaled by the total number of shares outstanding (in thousands).  $\Delta Holdings$  equals the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before the insider transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date. *B/M* is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure *Size* as the ln of the market value of the company at the end of the previous month. *PriorRet* equals the raw buy and hold stock return over the six-month period prior to the trades. *Restrict* represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003). *Earnings* is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. For all the models, we make our inferences based on the cluster-robust standard errors.

Panel A: Sub-period Results

	Predicted Sign	1996-1997	1998-2000	2001-2003
<u>Purchases</u>				
<i>Ret</i>	+	0.21*	0.15**	0.31***
<i>Holdings</i>	-	-0.00	0.00*	0.00*
$\Delta$ <i>Holdings</i>	-	-0.00	0.00	-0.01
<i>B/M</i>	+	-0.24	0.13	0.20**
<i>Size</i>	-	-0.23***	-0.24***	-0.16***
<i>PriorRet1</i>	-	-0.81***	-0.88***	-0.27*
<i>Restrict</i>	-	-1.15***	-1.27***	-1.00***
<i>Earnings</i>	?	0.55***	0.43***	0.65***
<i>Restrict*Earnings</i>	+	1.24***	1.57***	1.43***
# of obs		5439	11128	7296
Pseudo R2		0.1337	0.1744	0.1781
Log likelihood		-1640	-3205	-2092
<u>Sales</u>				
<i>Ret</i>	-	-0.29*	-0.15*	-0.24*
<i>Holdings</i>	+	-0.00	0.00	0.01***
$\Delta$ <i>Holdings</i>	+	0.02	0.05*	0.18**
<i>B/M</i>	-	-0.73**	-0.96***	-0.69***
<i>Size</i>	+	0.12**	0.28***	0.28***
<i>PriorRet1</i>	+	1.31***	0.51***	0.63***
<i>Restrict</i>	-	-1.30***	-0.81***	-1.09***
<i>Earnings</i>	?	0.48***	0.65***	0.58***
<i>Restrict*Earnings</i>	+	1.60***	1.48***	1.27***
# of obs		5029	8408	11504
Pseudo R2		0.1997	0.2815	0.2649
Log likelihood		-1409	-2117	-2958

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

Panel B: Directors' Trading Information Set

	Purchases		Sales	
	Predicted Sign	Coefficient	Predicted Sign	Coefficient
<i>Ret</i>	+	0.22 <sup>***</sup>	-	-0.17 <sup>**</sup>
<i>Holdings</i>	-	0.00	+	0.00
$\Delta$ <i>Holdings</i>	-	0.00	+	0.03
<i>B/M</i>	+	0.18 <sup>**</sup>	-	-0.84 <sup>***</sup>
<i>Size</i>	-	-0.22 <sup>***</sup>	+	0.22 <sup>***</sup>
<i>PriorRet1</i>	-	-0.64 <sup>***</sup>	+	0.65 <sup>***</sup>
<i>Restrict</i>	-	-1.16 <sup>***</sup>	-	-1.11 <sup>***</sup>
<i>Earnings</i>	?	0.52 <sup>***</sup>	?	0.56 <sup>***</sup>
<i>Restrict*Earnings</i>	+	1.43 <sup>***</sup>	+	1.43 <sup>***</sup>
<i>Turnover</i>	?	0.01	?	0.01 <sup>**</sup>
# of obs		6861		24941
log likelihood		-6969		-6746
Pseudo R2		0.1624		0.2273

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

Panel C: Director Trading as a Predictor of Future Stock Returns

	6-month (1)	9-month (2)	12-month (3)
<u>Purchases</u>			
<i>Trade</i>	0.069***	0.080***	0.098***
<i>Holdings</i>	-0.000	0.000	-0.000
$\Delta$ <i>Holdings</i>	-0.001**	-0.001*	-0.000
<i>B/M</i>	0.166***	0.266***	0.418***
<i>Size</i>	-0.016***	-0.011*	0.025***
<i>PriorRet1</i>	-0.259***	-0.554***	-1.003***
<i>Restrict</i>	-0.003	-0.016	-0.033
<i>Earnings</i>	-0.015	-0.012	-0.043
<i>Restrict*Earnings</i>	0.013	0.028	0.043
<i>Constant</i>	0.076**	-0.113	-0.762***
R-square	0.0502	0.0601	0.0672
<u>Sales</u>			
<i>Trade</i>	-0.072***	-0.102***	-0.102***
<i>Holdings</i>	-0.000	-0.000	-0.000
$\Delta$ <i>Holdings</i>	-0.003***	-0.008***	-0.014***
<i>B/M</i>	0.215***	0.384***	0.673***
<i>Size</i>	-0.004	0.011*	0.043***
<i>PriorRet1</i>	-0.230***	-0.473***	-0.966***
<i>Restrict</i>	-0.058***	-0.062**	-0.041
<i>Earnings</i>	-0.004	-0.009	-0.029
<i>Restrict*Earnings</i>	0.051**	0.077**	0.099
<i>Constant</i>	-0.103**	-0.472***	-1.180***
R-square	0.0832	0.1006	0.1020

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

**Table VI**  
**Tax Loss Selling**

In this table we test the effect of December tax loss selling on the informativeness of director trading by introducing a set of dummy variables to interact with our return variables where if the trade occurs in December:  $Dec=1$  and  $NotDec=0$  and if the trade does not occur in December:  $Dec=0$  and  $NotDec=1$ . The sample includes purchases and sales performed by multi-company directors between 1996 and 2003.  $Ret$  is the buy and hold four-factor adjusted abnormal return over the six-month period following insider trades.  $Holdings$  represents the number of shares held by the director the day before the transactions scaled by the total number of shares outstanding (in thousands).  $\Delta Holdings$  equals the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before the insider transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date.  $B/M$  is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure  $Size$  as the ln of the market value of the company at the end of the previous month.  $PriorRet$  equals the raw buy and hold stock return over the six-month period prior to the trades.  $Restrict$  represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003).  $Earnings$  is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. We make inferences based on the cluster-robust standard errors.

	Purchases		Sales	
	Predicted Signs	Coefficients	Predicted Signs	Coefficients
$Ret*Dec$	+	0.31**	?	-0.13
$Ret*NotDec$	+	0.20***	-	-0.20***
$Holdings$	-	0.00	+	0.00
$\Delta Holdings$	-	0.00	+	0.04
$B/M$	+	0.17**	-	-0.85***
$Size$	-	-0.22***	+	0.22***
$Priorret*Dec$	-	-0.73***	?	0.68**
$Priorret*NotDec$	-	-0.62***	+	0.66***
$Restrict$	-	-1.16***	-	-1.12***
$Earnings$	?	0.52***	?	0.55***
$Restrict*Earnings$	+	1.43***	+	1.43***
log likelihood		-7005		-6769
Pseudo R2		0.1581		0.2246
Coefficients:				
$Ret*Dec=Ret*NotDec$				
P-value		0.4243		0.6478
$Priorret*Dec=Priorret*NotDec$				
P-value		0.6216		0.9521

## Table VII

### Nature of Private Information

This table examines whether directors' information advantages derive mainly from superior knowledge about future earnings realizations. The sample includes purchases and sales performed by multi-company directors between 1996 and 2003. We add two additional explanatory variables,  $\Delta ROA1$  and  $\Delta ROA2$ .  $\Delta ROA1$  is the next fiscal year's annual earnings innovation, and it is defined as  $\Delta ROA1 = ROA_{t+1} - ROA_t$ , where  $ROA_t$  equals the net income before extraordinary items (Compustat annual item 20) scaled by total assets in year  $t$  (Compustat annual item 6).  $\Delta ROA2$  is the contemporaneous annual earnings innovation defined similarly as  $\Delta ROA2 = ROA_t - ROA_{t-1}$ .  $Ret$  is the buy and hold four-factor adjusted abnormal return over the six-month period following insider trades.  $Holdings$  represents the number of shares held by the director the day before the transactions scaled by the total number of shares outstanding (in thousands).  $\Delta Holdings$  equals the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before directors' transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date.  $B/M$  is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure  $Size$  as the  $\ln$  of the market value of the company at the end of the previous month.  $PriorRet$  equals the raw buy and hold stock return over the six-month period prior to the trades.  $Restrict$  represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003).  $Earnings$  is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. Column 1 estimates model (1) with only the informational motives as the independent variables. Column 2 estimates model (1) with both the informational motives and the control variables as the independent variables. We report the estimated coefficients and the  $z$ -statistics based on the cluster-robust standard errors.

	Predicted Sign	1		2	
		Coefficient	Z	Coefficient.	Z
Panel A: Purchases					
<i>Ret</i>	+	0.37***	7.49	0.20***	4.06
$\Delta ROA1$	+	-0.17	-1.07	0.07	0.49
$\Delta ROA2$	+	0.28**	2.24	0.35***	3.21
<i>Holdings</i>	-			0.00	1.57
$\Delta Holding$	-			0.00	0.39
<i>B/M</i>	+			0.16*	1.97
<i>Size</i>	-			-0.22***	-7.38
<i>PriorRet1</i>	-			-0.64***	-4.35
<i>Restrict</i>	-			-1.16***	-13.24
<i>Earnings</i>	?			0.52***	9.20
<i>Restrict*Earnings</i>	+			1.43***	15.65
log likelihood		-8174		-6990	
Pseudo R2		0.0176		0.1599	
Panel B: Sales					
<i>Ret</i>	-	-0.43***	-6.89	-0.20***	-2.97
$\Delta ROA1$	-	0.59	2.95	0.23	1.36
$\Delta ROA2$	-	-0.01*	-0.06	-0.05	-0.47
<i>Holdings</i>	+			0.00	0.62
$\Delta Holding$	+			0.04	1.61
<i>B/M</i>	-			-0.84***	-4.20
<i>Size</i>	+			0.23***	5.16
<i>PriorRet1</i>	+			0.65***	6.42
<i>Restrict</i>	-			-1.12***	-7.15
<i>Earnings</i>	?			0.55***	8.18
<i>Restrict*Earnings</i>	+			1.44***	10.89
log likelihood		-8514		-6782	
Pseudo R2		0.0248		0.2231	

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.

**Table VIII**  
**Are the Insider Trades of Busy Directors Less Informative?**

In this table we test the effect of director busyness on the informativeness of director trading by introducing a set of dummy variables to interact with our return variables where if the director holds more than two stocks at the time of transaction, *Busy*=1 and *Notbusy*=0; and if the director does not hold more than two stocks at the time of transaction, *Busy*=0 and *Notbusy*=1. *Ret* is the buy and hold four-factor adjusted abnormal return over the six-month period following insider trades. *Holdings* represents the number of shares held by the director the day before the transactions scaled by the total number of shares outstanding (in thousands).  $\Delta$ *Holdings* equals the total increase in a director's stock holdings of the company scaled by the total number of shares outstanding (in thousands) on the day before the insider transactions. This increase could occur as a result of factors such as the receipt of stock or option grants in the one-year period prior to the transaction date. *B/M* is the ratio of the company's book value (Compustat annual item 60) to market value (Compustat annual item 199\*25) at the end of the most recent fiscal year. We measure *Size* as the ln of the market value of the company at the end of the previous month. *PriorRet* equals the raw buy and hold stock return over the six-month period prior to the trades. *Restrict* represents the trading window proxy for the existence of insider trading restriction policies as in Roulstone (2003). *Earnings* is a dummy variable that takes the value one if the timing of the trading decision coincides with the 30-day period following an earnings announcement, and zero otherwise. We make inferences based on the cluster-robust standard errors.

	Purchases		Sales	
	Predicted Sign	Coefficient	Predicted Sign	Coefficient
<i>Ret*Busy</i>	+	0.19***	-	-0.14
<i>Ret*Notbusy</i>	-	0.22***	+	-0.22***
<i>Holdings</i>	-	0.00	+	0.00
$\Delta$ <i>Holding</i>	-	0.00	+	0.04
<i>B/M</i>	+	0.17**	-	-0.85***
<i>Size</i>	-	-0.22***	+	0.22***
<i>PriorRet</i>	-	-0.63***	+	0.67***
<i>Restrict</i>	-	-1.16***	-	-1.12***
<i>Earnings</i>	?	0.52***	?	0.55***
<i>Restrict*Earnings</i>	+	1.43***	+	1.44***
# of obs		23863		24941
Coefficients:				
<i>Ret*busy=Ret*Notbusy</i>				
P-value		0.7074		0.5818
Log likelihood		-7006		-6786
Pseudo R2		0.1580		0.2227

Significant at 1% (\*\*\*), 5% (\*\*), and 10% (\*) levels.