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# **UMI**

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Management Earnings Forecasts and Insider Trading Activity

by

Christopher Francis Noe

Submitted in Partial Fulfillment

of the

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DOCTOR OF PHILOSOPHY

Supervised by

Professor S.P. Kothari

William E. Simon Graduate School of Business Administration

University of Rochester  
Rochester, New York

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**DEDICATION**

I would like to dedicate this paper to my grandfather, Joseph T. Conrad, who passed away in 1988. He will always be a part of me.

## **CURRICULUM VITAE**

The author was born in Buffalo, New York on September 24, 1968. He attended Emory University between 1986-90 and graduated summa cum laude with a Bachelor of Arts in Economics degree. He came to the William E. Simon Graduate School of Business Administration at the University of Rochester in 1990 and began graduate studies in the fields of accounting and finance. He received a Masters of Science in Business Administration degree in 1993. He pursued his research under the direction of Professor S.P. Kothari and received a Doctor of Philosophy in Business Administration degree in 1996.

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## ABSTRACT

This paper investigates the association between management earnings forecasts and insider trading activity (i.e., transactions made by managers in their own firms' shares). The findings show that the incidence of insider trading activity decreases prior to management earnings forecasts and increases afterwards. Moreover, the findings show that the likelihood of an insider transaction occurring in the period following a management earnings forecast is related to empirical proxies for a manager being privately informed. Overall, these findings are consistent with managers utilizing the opportunity provided by corporate news events to bond themselves against exploiting private information for insider trading purposes. No support is found for hypotheses that link insider trading patterns around corporate news events to managerial opportunism.



## TABLE OF CONTENTS

| <b>Section</b>  | <b>Page</b> |
|---|-------------|
| Chapter 1 Introduction .....  | 1           |
| Chapter 2 Literature Review .....   |             |
| 2.1 Insider trading activity .....  | 4           |
| 2.2 Voluntary disclosures .....   | 7           |
| Chapter 3 Hypothesis Development .....  | 11          |
| Chapter 4 Sample Description .....  | 17          |
| Chapter 5 Research Design and Empirical Evidence .....                                  |             |
| 5.1 Incidence of insider trading activity around<br>management earnings forecasts ..... | 24          |
| 5.2 Characteristics of post-forecast<br>insider transactions .....                      | 34          |
| 5.3 Alternative hypothesis of managerial<br>opportunism .....                           | 42          |
| 5.4 Examining the issue of association<br>vs. causality .....                           | 47          |
| Chapter 6 Summary .....   | 53          |
| Appendix 1 Regulation Background .....  |             |
| A1.1 Insider trading activity .....   | 55          |
| A1.2 Voluntary disclosures .....  | 56          |
| Bibliography .....  | 58          |

**LIST OF TABLES**

| <b>Table</b> | <b>Title</b>  | <b>Page</b> |
|--------------|---|-------------|
| 1            | Summary statistics for 85 sample firms  | 70          |
| 2            | Summary statistics for 949 management earnings forecast dates of 85 sample firms between 7/1/79 and 12/31/87  | 71          |
| 3            | Summary statistics for 10,682 insider transactions of 85 sample firms between 4/1/79 and 3/31/88  | 73          |
| 4            | Changes in insider trading activity around 949 management earnings forecast dates   | 76          |
| 5            | Pearson correlation coefficients among characteristics of 10,102 insider transactions of 85 sample firms between 7/1/79 and 12/31/87  | 78          |
| 6            | Logit estimation of characteristics of insider transactions that occur closely after management earnings forecasts  | 80          |
| 7            | Ex-post errors for sub-set of 1,211 management earnings forecasts with predictions in either point or range formats categorized by post-forecast net insider trading activity | 82          |
| 8            | Differences in insider trading activity after quarterly earnings announcements based upon timing with respect to management earnings forecasts                                | 83          |

**LIST OF FIGURES**

| <b>Figure</b> | <b>Title</b>  | <b>Page</b> |
|---------------|---|-------------|
| 1             | Number of insider sales per week around 949 management earnings forecast dates  | 62          |
| 2             | Number of insider purchases per week around 949 management earnings forecast dates  | 63          |
| 3             | Number of insider acquisitions by exercise of options per week around 949 management earnings forecast dates  | 64          |
| 4             | Mean daily total trading volume around 949 management earnings forecast dates   | 65          |
| 5             | Mean cumulative abnormal return around 949 management earnings forecast dates categorized by pre-forecast net insider trading activity              | 66          |
| 6             | Mean cumulative abnormal return around sub-set of management earnings forecast dates with pre-forecast insider acquisitions by exercise of options  | 67          |
| 7             | Mean cumulative abnormal return around 949 management earnings forecast dates categorized by post-forecast net insider trading activity             | 68          |
| 8             | Mean cumulative abnormal return around sub-set of management earnings forecast dates with post-forecast insider acquisitions by exercise of options | 69          |

## Chapter 1 Introduction

Managers often are better informed than investors with respect to their firms' prospects. A way for managers to profit on this information is to use it when trading in the shares of their own firms. However, it is possible for other market participants to protect themselves against such self-serving behavior. Glosten and Milgrom (1985) and Barclay and Smith (1988) demonstrate that market-makers widen bid-ask spreads in response to facing an increased number of informed traders. Market-makers reduce losses on transactions with informed traders by establishing wider bid-ask spreads, but a consequence of this action is that the share-exchange process becomes more costly for all traders. Thus, insider trading activity can be detrimental to firms if investors discount stock prices for having to bear higher information-related transactions costs.<sup>1</sup>

Efforts to control the potential investor-manager conflict arising out of insider trading activity should take the form of contracting mechanisms that attempt to limit managers' profit opportunities. Some firms restrict insider trading activity to periods following mandatory disclosures. For example, Compaq Computer Corp. requires that all insider transactions take place in a two-month window after quarterly earnings announcements ["Heavy Insider Sales are Made at Compaq" *WSJ* 6/9/93]. Alternatively, other firms place no explicit restrictions on the timing of insider

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<sup>1</sup>In the context of this paper, insider trading activity is defined as all transactions made by managers in the shares of their own firms.

transactions but subject managers to government sanctions for the appearance of profiteering. Sivakumar and Waymire (1994) analyze insider trading activity around quarterly earnings announcements to determine whether corporate and/or regulatory restrictions produce a clustering of insider transactions in periods following the public release of information. Their findings show that the incidence of insider trading activity decreases prior to these announcements and increases afterwards.

This paper builds upon the analysis of insider trading activity in Sivakumar and Waymire (1994). It argues that the timing of insider transactions around corporate news events represents the outcome of a private contracting process between investors and managers to control managers' use of private information for insider trading purposes. By concentrating insider transactions in periods following the public release of information, managers pre-commit to engage in insider trading activity when information asymmetry is relatively low. However, mandatory disclosures are not the only channel through which investors can receive information from managers. If managers' statements are regarded as being credible, managers should be able to concentrate insider transactions after voluntary disclosures such as management earnings forecasts. This paper uses a sample of 949 management earnings forecast dates of 85 firms between July 1, 1979 and December 31, 1987 to test whether there is a clustering of insider transactions in the period following disclosures of this kind.

The findings show that the incidence of insider trading activity decreases prior to management earnings forecasts and increases afterwards. Moreover, the findings

show that the likelihood of an insider transaction occurring in the period following a management earnings forecast is related to empirical proxies for the possibility of a manager being privately informed. Post-forecast insider transactions are more frequent outside of the period following quarterly earnings announcements. These transactions are also made by managers with more day-to-day involvement in their firms' operations and in circumstances where transaction size is large relative to the number of shares outstanding. Overall, these findings are consistent with corporate news events providing managers with the opportunity to bond themselves against exploiting private information for insider trading purposes. No support is found for hypotheses that link insider trading patterns around corporate news events to managerial opportunism. Specifically, managers do not appear to use foreknowledge of information contained in management earnings forecasts to their own advantage, as reported in Penman (1982). In addition, managers do not appear to make deliberately misleading predictions in order to profit on the resulting information asymmetry.

The remainder of this paper is organized as follows. Chapter 2 summarizes existing research on insider trading activity and voluntary disclosures. Chapter 3 develops the hypotheses. Chapter 4 provides summary statistics for the samples of management earnings forecast dates and insider transactions. Chapter 5 discusses the empirical evidence in conjunction with providing information on the research design. Chapter 6 contains concluding remarks. Appendix 1 provides background on relevant regulatory issues.

## Chapter 2 Literature Review

This literature review describes the current state of research on insider trading activity and voluntary disclosures. As outlined in the introduction, this paper builds upon the analysis of insider trading activity in Sivakumar and Waymire (1994). However, the perspective taken in Sivakumar and Waymire (1994) differs from other work on insider trading activity. Primarily, opportunistic behavior by managers has been offered as the explanation for insider trading patterns around corporate news events. In contrast, this paper argues that the timing of insider transactions is a means to limit managerial opportunism.

With respect to existing research on voluntary disclosures, several explanations have been proposed for why firms might want to make such disclosures. These explanations are discussed with particular emphasis placed on work done within the agency framework. This framework argues that voluntary disclosures are made to facilitate contracting arrangements among different constituencies of a firm. Applying this perspective to a specific situation, this paper argues that voluntary disclosures provide an opportunity to control the potential investor-manager conflict arising out of insider trading activity.

### *2.1 Insider trading activity*

Insider trading activity is associated with abnormal profits [e.g., Jaffe (1974), Finnerty (1976a, 1976b), Seyhun (1986, 1988)]. As a result, much of the existing research in this subject area focuses on documenting situations where managers appear to be using private information for insider trading purposes.

Several studies investigate insider trading activity around announcements of changes in organizational structure. Hirschey and Zaima (1989) document a positive association between net insider trading activity and the stock price reaction to subsequent announcements of sell-offs. Seyhun (1990) finds that the magnitude of insider purchases by managers of bidder firms prior to takeover announcements is greater when the stock price reaction to these announcements is large and positive than when it is large and negative. Meulbroek (1992) reports that the average stock price run-up in target firms before takeover announcements is over twice as large on insider trading days than on days without any insider trading activity. However, Loderer and Sheehan (1989) find no evidence of increased insider sales prior to declarations of bankruptcy.

Other studies investigate insider trading activity around announcements of financing decisions or releases of financial information. Penman (1982) reports that net insider trading activity before management forecasts of annual earnings is related to whether the information about future earnings is favorable. Karpov and Lee (1991) find evidence of increased insider sales prior to secondary offerings of common stock and convertible debt. John and Lang (1991) document a positive association between net insider trading activity and the stock price reaction to subsequent announcements of initial dividend payments. Lee, Mikkelsen, and Partch (1992) find evidence of increased insider purchases and decreased insider sales before announcements of stock repurchases by tender offer.



Still other studies take a broader approach by investigating insider trading activity around many types of corporate news events. Elliott, Morse, and Richardson (1984) analyze insider trading activity in conjunction with the public release of information about large earnings changes, dividend changes, bond rating changes, mergers, and bankruptcies. Their findings are weakly consistent with some use of private information by managers but do not suggest a concerted effort to earn abnormal profits through the timing of insider transactions. Givoly and Palmon (1985) propose that insider trading activity reveals long-term information to securities markets and produces a wave of trading by investors in the same direction. Their findings provide support for this argument as no association is detected between net insider trading activity and the stock price reaction to subsequent corporate news events.

Sivakumar and Waymire (1994) move away from testing for a link between insider trading activity and opportunistic behavior by managers. They abandon the notion that the timing of insider transactions around corporate news events is motivated by managerial opportunism. Instead, they analyze insider trading activity around quarterly earnings announcements to determine whether regulatory and/or corporate restrictions produce a clustering of insider transactions in periods following the public release of information. Their findings show that the incidence of insider trading activity decreases prior to these announcements and increases afterwards. The pattern also holds for the magnitude of shares traded. This paper takes a perspective similar to that in Sivakumar and Waymire (1994). In direct contrast to the findings in

Penman (1982), it proposes that the timing of insider transactions relative to management earnings forecasts represents the outcome of a process to control managers' use of private information for insider trading purposes. By having to concentrate insider transactions in the post-forecast period, managers pre-commit to engage in insider trading activity when information asymmetry is relatively low. This action reduces the possibility of managers using private information to their own advantage.

## 2.2 *Voluntary disclosures*

Various explanations exist for why firms make voluntary disclosures. The driving force behind all of them is to reduce a cost arising from asymmetric information between managers and investors. However, only a few studies in this subject area have been successful in explaining time-series and cross-sectional variation in voluntary disclosures.

The signaling literature proposes that voluntary disclosures are made to provide securities markets with favorable information about firm performance [e.g., Verrecchia (1983, 1990)]. Lang and Lundholm (1993) and Healy, Palepu, and Sweeney (1995) find evidence that firms with strong current and historical financial performance experience an increase in Financial Analysts Federation (FAF) ratings of disclosure practices. Patell (1976), Penman (1980), Waymire (1984), and Lev and Penman (1990) report that the average stock price reaction to management earnings forecasts is positive and that "good news" forecasts outnumber "bad news" forecasts. However, Ajinkya and Gift (1984) and McNichols (1989) use samples of

management earnings forecasts from later periods and document a more symmetric disclosure pattern with respect to news content. Trueman (1986) proposes a variation of the usual signaling hypothesis. He argues that voluntary disclosures enable investors to observe the superior ability of managers to anticipate economic environment changes. This line of reasoning would suggest a positive stock price reaction to the act of making voluntary disclosures, but Pownall and Waymire (1989a) find that the act of issuing management earnings forecasts, by itself, does not convey favorable information to securities markets.

Other studies are concerned with the role of voluntary disclosures in limiting exposure to securities-fraud lawsuits [e.g., Kellogg (1984), Alexander (1991)]. Skinner (1994a) and Lev and Kasznik (1995) contend that securities law provides firms with an incentive to release unfavorable information before being required to do so in an earnings report. In support of this argument, they find that the incidence of management earnings forecasts and other voluntary disclosures are relatively high before announcements of large negative earnings surprises. However, Skinner (1994b) and Francis, Philbrick, and Schipper (1994a) report that management earnings forecasts and other voluntary disclosures often are cited by plaintiffs as initiating events for litigation. These findings suggest that the early release of adverse earnings news does not necessarily reduce the probability of avoiding securities-fraud lawsuits. In addition, Alexander (1991) finds that settlement amounts do not vary by much across different cases as most of them are settled before going to trial. Thus,

voluntary disclosures also appear to not be very useful in reducing litigation costs conditional on a securities-fraud suit being filed.

The agency literature proposes that voluntary disclosures are made to facilitate contracting arrangements by alleviating moral hazard and/or adverse selection problems [e.g., Jensen and Meckling (1976), Leftwich, Watts, and Zimmerman (1981), Ajinkya and Gift (1984), King, Pownall, and Waymire (1990)]. Cox (1985), Waymire (1985), and Lev and Penman (1990) document a positive association between firm size and management earnings forecasts reported in the financial press. Ruland, Tung, and George (1990) find that firms with a higher proportion of outside ownership are more likely to issue management earnings forecasts. Although it is plausible that large firms simply receive better press coverage, these findings are also consistent with more communication being required of managers as it becomes more difficult for investors to monitor their behavior. Healy et al. (1995) report that an increase in firms' FAF ratings is followed by narrower bid-ask spreads. Lang and Lundholm (1993) find evidence of firms that are involved in securities offerings experiencing an increase in FAF ratings. Ruland et al. (1990) and Frankel, McNichols, and Wilson (1995) find that the incidence of management earnings forecasts is relatively high before securities offerings. These findings are consistent with voluntary disclosures being used to mitigate adverse selection problems inherent in securities exchange processes.

On the whole, empirical studies in this subject area that draw upon agency theory have had the most success in explaining firms' voluntary disclosure patterns.

It is also the area of the voluntary disclosure literature that is most closely related to this paper. This paper acknowledges the potential moral hazard problem associated with managers being allowed to trade in their own firms' shares. Furthermore, it argues that voluntary disclosures provide an opportunity to control the investor-manager conflict arising out of this situation.

### **Chapter 3 Hypothesis Development**

There are many possible non-information explanations for managers wanting to trade in the shares of their own firms, including changes in wealth, preferences, or consumption opportunities. In addition, some fraction of insider holdings could be sold-off periodically in an effort to avoid being under-diversified, especially if executive pay packages include various forms of stock-based compensation. Although these explanations are not information-related, managers are often better informed than investors with respect to their firms' prospects. Insider trading activity gives managers the means to earn abnormal profits on this information. This situation represents a potential source of conflict with investors.

There are economic reasons to expect that the presence of informed traders in securities markets is likely to affect the behavior of market-makers to the detriment of all traders. Glosten and Milgrom (1985) develop a model in which market-makers lose in transactions with informed traders who trade only if it is profitable to do so. Their analysis suggests that bid-ask spreads are set to recoup these losses in transactions with uninformed traders and that an increase in the proportionate number of informed traders causes market-makers to widen quoted spreads. Barclay and Smith (1988) extend this model for the purpose of investigating corporate payout policy by specifically characterizing informed traders as managers.

Ultimately, the information-related cost of insider trading activity is borne by all traders as the share-exchange process becomes more costly. However, investors are aware of this potential problem and rationally anticipate managerial behavior

when they value firms. That is, they are able to price protect themselves. Thus, firms have an incentive to develop contracting mechanisms that attempt to control this potential investor-manager conflict arising out of insider trading activity. One way to accomplish this is for investors to invest resources in monitoring insider trading activity. Alternatively, managers can impose restrictions on their own behavior through bonding arrangements. The intent of either of these mechanisms is to limit managers' ability to exploit private information for insider trading purposes. These responses represent an alternative to investors lowering managers' total compensation and/or discounting stock prices to protect themselves from the expected level of opportunistic behavior by managers in an unconstrained environment.

Sivakumar and Waymire (1994) find evidence of managers adjusting the timing of insider transactions in a way that has the potential to reduce their profiteering opportunities. However, using mandatory disclosures is not the only way for managers to bond themselves against exploiting private information for insider trading purposes. If managers' statements are regarded as being credible, they should be able to concentrate insider transactions after voluntary disclosures. Voluntary disclosures, such as management earnings forecasts, represent a possible alternative to mandatory disclosures in terms of communicating managers' information to investors. The first hypothesis of this paper is stated as follows:

*H1: The incidence of insider trading activity decreases in the period before management earnings forecasts and increases afterward.*

The expected loss by market-makers to dealing with managers increases as the information advantage of managers increases. Viewed from a transactions-cost perspective, the benefit of having insider transactions concentrated in periods following the public release of information is greater as managers are more likely to be privately informed. Thus, managers who have a greater chance of being privately informed should be observed to concentrate insider transactions after corporate news events more frequently than other managers. For example, officers have more day-to-day involvement in their firms' operations as opposed to directors. As a result, these individuals are expected to have a relatively higher level of post-forecast insider trading activity. The second hypothesis of this paper is stated as follows:

H2: *The likelihood of an insider transaction occurring in the period following a management earnings forecast is related to empirical proxies for a manager being privately informed.*

Although this paper argues that changes in the incidence of insider trading activity around voluntary disclosures are the result of a control mechanism for managers, it is also plausible that these changes are driven by managerial opportunism. Indeed, much of the existing research on insider trading activity takes the position that managers use foreknowledge of information about corporate news events to their own advantage. If management earnings forecasts are viewed in this context, increased insider purchases and/or decreased insider sales should be observed in the period preceding "good news" forecasts. Conversely, decreased insider



purchases and/or increased insider sales should be observed in the period preceding “bad news” forecasts. The predictions are equivalent to those in Penman (1982). The third hypothesis of this paper attempts to replicate the findings in Penman (1982) and is stated as follows:

H3: *Increased insider purchases and/or decreased insider sales are observed in the period preceding “good news” forecasts, and decreased insider purchases and/or increased insider sales are observed in the period preceding “bad news” forecasts.*

The argument underlying the previous hypothesis is that managers earn abnormal profits from insider trading activity despite truthfully communicating information to investors. However, managers can also exhibit self-serving behavior by deliberately using voluntary disclosures to mislead investors. If management earnings forecasts are viewed in this context, increased insider sales should be observed in the period following “good news” forecasts, and increased insider purchases should be observed in the period following “bad news” forecasts. In addition, subsequent reversals in share prices should be observed when investors ultimately become aware of misstatements on the part of managers. The fourth hypothesis of this paper is stated as follows:

H4: *Increased insider sales are observed in the period following “good news” forecasts, and increased insider purchases are observed in the period following “bad news” forecasts.*

The argument underlying the first two hypotheses in this paper does not necessarily imply that voluntary disclosures are the result of managers wanting to trade in the shares of their own firms. Rather, voluntary disclosures are taken as exogenous events. Hypotheses are then generated regarding how insider transactions would be timed around these corporate news events to mitigate the information-related cost of insider trading activity. However, managers wanting to trade in their own firms' shares is a potential motivation for making voluntary disclosures. The findings from Sivakumar and Waymire (1994) are used to provide some evidence on this issue of causality.

Recall that the findings from Sivakumar and Waymire (1994) show that the incidence of insider trading activity is relatively high after quarterly earnings announcements. The amount of insider trading activity in the post-announcement period is used in this paper as a benchmark for managers' demand to trade in their own firms' shares. On a firm-by-firm basis, the level of post-announcement insider trading activity for those quarterly earnings announcements that occur near management earnings forecasts is compared to the level for all other quarterly earnings announcements. Increased use of what appears to be widely regarded as an acceptable insider trading “window” would provide indirect evidence on whether

management earnings forecasts are issued at times when the demand for insider trading activity is relatively high. However, it should be emphasized that the fifth hypothesis of this paper is purely descriptive with inferences then being made regarding the empirical findings. It is stated as follows:

H5: *The relative incidence of insider trading activity is higher in the period following those quarterly earnings announcements that occur near management earnings forecasts.*

#### Chapter 4 Sample Description

Pownall et al. (1993) is the source of the management earnings forecast data used in this paper. The sampling procedure from Pownall et al. (1993) is designed to provide a sufficiently broad sample of management earnings forecasts at low cost. It consists of two stages. In the first stage, a calendar quarter is selected without replacement for each year between 1980-83. Next, the sequence of selected quarters for each year between 1980-83 is reversed and assigned to each year between 1984-87. A full five-trading-day week is randomly selected for each quarter, and all management earnings forecasts are collected in these periods that meet two criteria: 1.) found by searching *The Wall Street Journal Index* or *Dow Jones News Retrieval Service* and 2.) expressed in a point, range, minimum, or maximum format. The size of the stage-one sample is 444 observations. In the second stage, 91 forecasting firms with available CRSP and COMPUSTAT data are randomly selected from the stage-one sample. A time-series record of management earnings forecasts is produced for each of these firms by repeating the previous search over the whole interval between July 1, 1979 and December 31, 1987. The size of the stage-two sample is 1,252 observations.

Six forecasting firms from the stage-two sample in Pownall et al. (1993) cannot be used in this paper because of difficulty in obtaining insider trading data for them. This reduces the size of the stage-two sample to 1,211 observations. Table 1 describes summary statistics for the resulting sample of 85 forecasting firms. Consistent with the findings in Cox (1985), Waymire (1985), and Lev and Penman

(1990), the sample firms tend to be relatively large. Their median market value of equity for fiscal years between 1978-86 is \$456 million. The sampling procedure does not appear to be systematically biased towards including better-than-average performers. Without adjusting for differences in systematic risk, the average annual stock return of 21.8% on these firms between 1979-87 is roughly equivalent to the 17.1% average annual return (not including dividends) on the Standard & Poor's 500 Stock Price Index over the same interval. Other financial information reveals that these firms have an average beta near one, an average leverage ratio of just under 20%, and an average market-to-book ratio of 1.48.

**[Table 1]**

Management earnings forecasts issued by the same sample firm on the same calendar day are treated as a single rather than separate observations. These predictions are typically contained in the same press release. Classifying these predictions as separate observations would disproportionately weight their impact on the findings. Table 2 describes summary statistics for the resulting sample of 949 management earnings forecast dates. Panel A provides information on forecast horizon for the sample dates. *Horizon1* is the number of trading days between the management earnings forecast date and the final day of the reporting period to which the prediction applies. If there is more than one prediction on the management earnings forecast date, this variable is calculated separately for each of them and is set equal to the maximum of these values. The mean of *Horizon1* is 116.3 trading days, indicating that these predictions have a lead time of almost six months. *Horizon2* is

the number of trading days between the management earnings forecast date and the date of the next quarterly earnings announcement. These forecasts are skewed towards the end of fiscal quarters as the mean of this variable is 19.7 trading days.

Panel A of Table 2 also provides information on the three-day cumulative abnormal return for the sample dates. Because corporate news events frequently occur outside of exchange trading hours and disclosure times are unavailable, changes in share prices are measured from event days -1 through +1 centered around the sample dates. A daily abnormal return is defined as the difference between a firm's stock return and the return on the CRSP value-weighted NYSE/AMEX index. A three-day cumulative abnormal return is calculated by summing daily abnormal returns. The statistical significance of the mean of this variable is assessed with a time-series *t*-statistic:

$$t(\overline{CAR}) = \frac{\overline{CAR}}{\sqrt{n\sigma^2}} \quad (1)$$

where  $n$  is the number of days in the return accumulation period and  $\sigma^2$  is the variance of daily portfolio abnormal returns measured between event days -100 through -51 and +50 through +99 around the sample dates. The mean of  $CAR(-1,+1)$  is -0.66% ( $t$ -statistic = -6.88), which contradicts the argument that management earnings forecasts are issued to provide securities markets with favorable information about firm performance.

Panel B of Table 2 describes the distribution of the sample dates across firms. The median number of these predictions per firm over the sampling interval is nine. Because one of the criteria for entering the stage-two sample in Pownall et al. (1993) is having issued at least one management earnings forecast, a concern about their sampling procedure is that it is biased towards including habitual forecasters. The median disclosure frequency of the sample firms is roughly ten times higher than what is obtained from the unconditional sampling procedure in Lev and Penman (1990). However, Lev and Penman (1990) focus exclusively on point or range predictions of annual earnings, which represent only 20% of the stage-two sample in Pownall et al. (1993). In addition, the sampling procedure from Lev and Penman (1990) involves searching *The Wall Street Journal*, which detects about one-half of the stage-two sample in Pownall et al. (1993). Thus, it appears that the relatively high disclosure frequency of the sample firms can be attributed to an expanded definition of management earnings forecasts instead of sample selection bias.

**[Table 2]**

Panel C of Table 2 describes the distribution of the sample dates across time. The years with the highest mean number of these predictions per month are 1980 and 1983 at 10.6. The year with the lowest mean number of these predictions per month is 1987 at 7.8. A chi-square goodness-of-fit test is used to compare the actual number of predictions in each year between 1979-87 to the number of predictions based upon a uniform distribution across the sampling interval. The resulting test statistic is 14.0, which is distributed chi-square with eight degrees of freedom. The value of the test

statistic required for rejection at the 10% level is 13.4. Thus, the null of no yearly variation in management earnings forecast dates can be weakly rejected.

Variation in the sample dates across calendar months is also discernible. April and October have the highest mean number of these predictions at 15.0. August and November have the lowest mean number of these predictions at 5.8 and 6.0. A chi-square goodness-of-fit test is used to compare the actual number of predictions in each month to the number of predictions based upon a uniform distribution across the sampling interval. The resulting test statistic is 109.9, which is distributed chi-square with 11 degrees of freedom. The value of the test statistic required for rejection at the 1% level is 24.7. Thus, the null of no monthly variation in management earnings forecast dates is rejected. The large number of sample dates in April is likely related to the fact that many annual shareholder meetings are held in this month. After adjusting for different fiscal year ends, the large number of these predictions in October and December provide support for the finding in McNichols (1989) that management earnings forecasts tend to be issued late in the fiscal year. In addition, October is a month when firms with December fiscal year ends typically have budget meetings for which earnings projections are prepared for planning purposes. Some firms could simply decide to release these internal estimates.

Information on insider trading activity for the sample firms was collected over the whole interval between April 1, 1979 and March 31, 1988 from the SEC *Official Summary of Security Transactions and Holdings*. Insider transactions were required to be open market sales, open market purchases, or acquisitions by exercise of options



made by either an officer or director. These criteria broadly follow existing research on insider trading activity and allow for the bulk of all insider transactions to be analyzed. Table 3 describes summary statistics for the resulting sample of 10,682 insider transactions. Panel A provides information on transaction size for the sample transactions in terms of number of shares, broken down by type of transaction. The mean transaction size of insider purchases is 2,274 shares. The mean transaction size of insider sales is 3,740 shares, and insider selling activity outweighs insider buying activity by a factor of five. However, when insider acquisitions by exercise of options are considered, net insider trading activity roughly amounts to zero.

Panel B of Table 3 provides information on transaction size for the sample transactions in terms of number of shares, broken down by corporate affiliation. Consistent with the findings in Seyhun (1986), the position of officer has the lowest mean transaction size, equaling 2,549 shares, and the position of chairman has the highest mean transaction size, equaling 8,174 shares. Also consistent with the findings in Seyhun (1986), officers tend to engage in insider trading activity most frequently. This finding is attributed to firms having many officers versus a single chairman and officers generally receiving a larger amount of stock-based compensation than directors.

**[Table 3]**

Panel C of Table 3 describes the distribution of the sample transactions across time, broken down by type of transaction. The mean number of insider sales and purchases change across calendar years between 1979-87 but display no apparent

trend. In contrast, insider acquisitions by exercise of options almost double over the same interval, reflecting the increased popularity of stock-based compensation. Consistent with these findings, Sloan (1993) finds that the percentage of firms using stock option plans increased from 60% in 1980 to 80% in 1988.

As for variation in insider trading activity across calendar months, the timing of insider sales appears to be related to the timing of insider acquisitions by exercise of options with their levels being particularly high in February and August. The mean number of insider sales in February and August are 70.6 and 67.9. The mean number of insider acquisitions by exercise of options in February and August are 56.8 and 41.8. February is the month when firms with December fiscal year ends typically announce annual earnings numbers. As a result, this finding could reflect a corporate policy of setting the expiration dates of executive stock options on an annual or semi-annual basis relative to the

## Chapter 5 Research Design and Empirical Evidence

This chapter discusses the empirical evidence in this paper as well as providing information on its research design. First, findings are presented regarding the incidence of insider trading activity around management earnings forecasts. The findings are broadly consistent with managers adjusting the timing of transactions in their own firms' shares until after these forecasts. Various robustness checks on these findings do not diminish their statistical significance. Second, characteristics of post-forecast insider transactions are examined. The findings support the hypothesis that insider transactions made by a manager with a greater possibility of being privately informed are more likely to be concentrated in periods after corporate news events. Third, an alternative hypothesis of managerial opportunism is tested to see whether it can explain insider trading patterns around corporate news events. Measures of stock price changes around the sample of management earnings forecast dates do not reveal insider trading patterns consistent with managers using information contained in these forecasts to their own advantage. Lastly, the issue of insider trading activity being the motivation behind the making of voluntary disclosures is addressed.

### *5.1 Incidence of insider trading activity around management earnings forecasts*

Insider trading activity is analyzed for 100 trading days around the sample of management earnings forecast dates. The choice of 100 trading days as the event period corresponds closely to the event period from Sivakumar and Waymire (1994). Daily data on insider trading activity between event days -50 through +49 are

summed into 20 five-trading-day intervals. Figures 1-3 describe the total number of insider transactions per week around the sample dates for insider sales, purchases, and acquisitions by exercise of options.

Theory is unable to predict the exact weekly pattern of insider trading activity around management earnings forecasts. However, the patterns in Figures 1-3 are similar to the ones for earnings announcements in Sivakumar and Waymire (1994). Figure 1 shows that the incidence of insider sales goes down in the four weeks leading up to management earnings forecasts. This figure also shows that the incidence of insider sales goes up after management earnings forecasts to a level that is slightly higher than all other weeks in the event period, even after excluding the four weeks of declining pre-forecast insider sales. The four-week average of the total number of insider sales per week for event weeks +1 through +4 is 13.2. The corresponding average for all other weeks in the event period, excluding the four weeks before the management earnings forecasts, is 12.5.

The pattern in Figure 3 for insider acquisitions by exercise of options is very similar to that for insider sales, but one difference between these two figures is in the level of post-forecast insider trading activity. The concentration of insider acquisitions by exercise of options in the post-forecast period is greater than insider sales. The four-week average of the total number of insider acquisitions by exercise of options per week for event weeks +1 through +4 is 11.5. The corresponding average for all other weeks in the event period, excluding the four weeks before the management earnings forecasts, is 9.0. The pattern in Figure 2 for insider purchases

also shows a high concentration of post-forecast insider trading activity. The four-week average of the total number of insider purchases per week for event weeks +1 through +4 is 4.8. The corresponding average for all other weeks in the event period, excluding the four weeks before the management earnings forecasts, is 3.0. However, unlike insider sales or acquisitions by exercise of options, the incidence of insider purchases does not decline in the weeks leading up to management earnings forecasts.

**[Figures 1-3]**

The first hypothesis of this paper predicts that the incidence of insider trading activity will decrease before management earnings forecasts and increase afterwards. Overall, Figures 1-3 provide preliminary evidence to support this hypothesis, but the statistical significance of changes in insider trading activity around management earnings forecasts has not yet been ascertained. More importantly, the presence of quarterly earnings announcements in the event period has not been taken into account. Quarterly earnings announcements have been shown by Sivakumar and Waymire (1994) to affect insider trading activity in the same way that is predicted for management earnings forecasts in this paper. Thus, it is essential to control for the presence of these announcements in the event period. Otherwise, changes in insider trading activity around quarterly earnings announcements could be incorrectly attributed to management earnings forecasts. This correlated omitted variables problem is of particular concern for insider sales and acquisitions by exercise of options. Panel C of Table 3 documents that the level of insider sales and acquisitions by exercise of options are relatively high during February and August, and these two

months are where firms with December fiscal year-ends typically make annual and semi-annual earnings announcements.

Table 4 describes the findings of an OLS regression model that is used to assess the statistical significance of changes in insider trading activity around the sample of management earnings forecast dates. Three time-series OLS regressions are estimated for every management earnings forecast date. The dependent variables are the daily number of insider sales, purchases, and acquisitions by exercise of options. The independent variables consist of a series of dummy variables that correspond to event weeks around the sample dates. In addition, another set of dummy variables is included in these regressions to take into account the presence of quarterly earnings announcements in the event period. The model takes the following form:

$$\begin{aligned}
 \text{InsSales}_t, \text{InsPurchases}_t, \text{ or } \text{InsOptions}_t = & \alpha + \beta_1 D_{\text{PreMF2}} + \beta_2 D_{\text{PreMF1}} \\
 & + \beta_3 D_{\text{PostMF1}} + \beta_4 D_{\text{PostMF2}} \\
 & + \gamma_1 D_{\text{PreEA}} + \gamma_2 D_{\text{PostEA}} + \varepsilon_t \quad (2)
 \end{aligned}$$

where day  $t$  is between event days -50 and +49 relative to the management earnings forecast date

Variable descriptions:

*InsSales*, *InsPurchases*, and *InsOptions* are the daily number of insider sales, purchases, and acquisitions by exercise of options.

$D\_PreMF2$  takes on the value of one (zero otherwise) if day  $t$  is between event days -20 and -11 relative to the management earnings forecast date;  $D\_PreMF1$  takes on the value of one (zero otherwise) if day  $t$  is between event days -10 and -1 relative to the management earnings forecast date.

$D\_PostMF1$  takes on the value of one (zero otherwise) if day  $t$  is between event days +1 and +10 relative to the management earnings forecast date;  $D\_PostMF2$  takes on the value of one (zero otherwise) if day  $t$  is between event days +11 and +21 relative to the management earnings forecast date.

$D\_PreEA$  takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window before a quarterly earnings announcement;  $D\_PostEA$  takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window after a quarterly earnings announcement.

Cross-sectional averages of the estimated coefficients from the three separate sets of 949 time-series regressions as described in eq. (2) are reported in Table 4. A  $t$ -statistic is used to assess their statistical significance. The  $t$ -statistic is formed by dividing the cross-sectional averages of the estimated coefficients by the sample standard deviation and the square root of the sample size. An example of the implementation of this technique can be seen in Lee, Mucklow, and Ready (1993). It is particularly useful for avoiding problems having to do with interpreting significance levels on independent variables in regressions with extremely large sample sizes.

**[Table 4]**

Generally, the findings from Table 4 are consistent with Figures 1-3. The mean number of daily insider transactions decreases significantly out to event week -4 for insider acquisitions by exercise of options and out to event week -2 for insider sales. The coefficients on  $D\_PreMF2$  and  $D\_PreMF1$  for insider acquisitions by exercise of options are -0.0069 (one-sided  $p$ -value of 0.01) and -0.0048 (one-sided  $p$ -value of 0.01). These coefficients represent an average decline of 33% from the unconditional mean of daily insider acquisitions by exercise of options in the event period, which is measured by the intercept term in the regression. The coefficient on  $D\_PreMF1$  for insider sales is -0.0062 (one-sided  $p$ -value of 0.01). This coefficient represents a decline of 25% from the unconditional mean of daily insider sales in the event period. No pre-forecast decline is measured for insider purchases. In fact, the mean daily level of insider purchases between event weeks -1 through -4 relative to the management earnings forecast dates is higher than the unconditional mean in the event period.

The mean number of daily insider transactions increases significantly out to event week +4 for all types of transactions. The coefficients on  $D\_PostMF1$  and  $D\_PostMF2$  for insider sales are 0.0059 (one-sided  $p$ -value of 0.01) and 0.0039 (one-sided  $p$ -value of 0.05). These coefficients represent an average increase of 20% over the unconditional mean daily level of insider sales in the event period. The coefficients on  $D\_PostMF1$  and  $D\_PostMF2$  for insider purchases are 0.0039 (one-sided  $p$ -value of 0.01) and 0.0032 (one-sided  $p$ -value of 0.01). These coefficients



represent an average increase of 75% over the unconditional mean daily level of insider purchases in the event period. The coefficients on  $D\_PostMF1$  and  $D\_PostMF2$  for insider acquisitions by exercise of options are 0.0002 ( $p$ -value of 0.47) and 0.0039 ( $p$ -value of 0.04). These coefficients represent an average increase of 10% over the unconditional mean daily level of insider acquisitions by exercise of options in the event period.

With respect to the intercept terms in the regressions from Table 4, these coefficients appear to be very small upon initial inspection. However, the intercept terms in these regressions measure the daily number of insider transactions per firm over the sampling interval. Existing literature on insider trading activity as well as the insider transactions data from Table 3 reveals that managers do not trade in their firms' shares on a daily basis. In fact, for the 85 sample firms in this paper, the average number of insider transactions per firm year is approximately 15. This number is similar to what other studies on insider trading activity have documented regarding trading frequency. Moreover, dividing this number by 250 trading days, which is roughly the number in a year, gives daily averages that are of similar magnitude to the coefficients from the regressions in Table 4.

Confirming the findings from Sivakumar and Waymire (1994), the mean daily number of insider sales and purchases are significantly higher after quarterly earnings announcements. The coefficient on  $D\_PostEA$  is 0.0067 (one-sided  $p$ -value of 0.01) for insider sales and 0.0027 (one-sided  $p$ -value of 0.01) for insider purchases. Insider acquisitions by exercise of options display a similar pattern with a coefficient on

$D\_PostEA$  of 0.0099 (one-sided  $p$ -value of 0.01). Also consistent with the findings from Sivakumar and Waymire (1994), the incidence of insider sales is significantly lower before quarterly earnings announcements. The coefficient on  $D\_PreEA$  is -0.0091 for insider sales (one-sided  $p$ -value of 0.01). However, the coefficient on  $D\_PreEA$  for insider purchases is not statistically different from zero. This finding is not consistent with those from Sivakumar and Waymire (1994), but it does corroborate the empirical evidence from this paper on pre-forecast insider purchases.

The magnitude of the average coefficient on  $D\_PostEA$  for the different types of insider transactions is usually higher than corresponding values on  $D\_PostMF1$  and  $D\_PostMF2$ . This finding indicates that quarterly earnings announcements produce a greater concentration of post-announcement insider transactions than management earnings forecasts. A possible explanation for this finding is that a greater amount of information is likely to be made available in quarterly earnings announcements compared to management earnings forecasts. This results in a relatively low post-disclosure level of information asymmetry, which makes the act of managers concentrating insider transactions after these announcements more valuable to investors.

Despite the strong statistical significance on  $D\_PostEA$  for all types of transactions, the findings from Table 4 suggest that the support for the first hypothesis of this paper remains even after controlling for the presence of quarterly earnings announcements in the event window. The general pattern of insider trading activity around management earnings forecasts that emerges from the findings in Table 4

consists of a pre-forecast decline and a post-forecast increase. The single exception to this pattern is the lack of a pre-forecast decline for insider purchases. Both the decline and increase persist for up to four weeks. Thus, it appears that managers delay trading in their own firms' shares until after management earnings forecasts. This pattern is consistent with managers bonding themselves to trade in their own firms' shares in periods of relatively low information asymmetry.

However, another possible explanation for observed insider trading patterns in Figures 1-3 is that managers' insider trading decisions are just a reflection of market-wide trading volume. Previous research has shown that management earnings forecasts cause significant revisions in stock prices. It is possible that this market-wide reaction to the information in these forecasts also causes an increase in total trading volume. Thus, an increase in insider trading activity might be consistent with managers simply responding to the information in management earnings forecasts just as other investors do.

Figure 4 describes changes in the mean daily total trading volume around the sample of management earnings forecast dates. Total daily trading volume for each sample firm is deflated by number of shares outstanding in order to avoid placing a disproportionate weight on firms with large mean daily total trading volumes. The graph is constructed on a daily as opposed to a weekly basis. Lee, Mucklow, and Ready (1993) investigate intra-day price and volume reactions to quarterly earnings announcements. They document a post-announcement increase in total trading volume, but it persists for only two trading days. Using weeks as the unit of analysis

in this graph potentially could obscure some significant trends as management earnings forecasts are likely to be similar to quarterly earnings announcements in terms of their market-wide trading volume reaction.

**[Figure 4]**

The findings from Figure 4 indicate that total trading volume is relatively high after management earnings forecasts. However, this increased level of total trading volume only persists for approximately three trading days after these forecasts as opposed to a four-week interval for insider trading activity. An OLS regression using the same procedure as in Table 4 is employed to verify the statistical significance of the increase in total trading volume after management earnings forecasts. The findings from this regression are not reported in this paper, but they do confirm that total trading volume is only significantly higher at conventional statistical levels between event days 0 through +3 around these forecasts. There is no significant decrease in total trading volume before management earnings forecasts, which would be expected if the timing and content of these forecasts cannot be predicted by investors. Consequently, changes in the incidence of insider trading activity around management earnings forecasts appear to be driven by a phenomenon that is distinct from a market-wide response to the public release of information.

Yet another possible explanation for observed insider trading patterns in Figures 1-3 concerns firm-specific risk. Because managers' wealth is extremely sensitive to changes in the value of their firms, they might rationally adjust their insider holdings in response to changes in the volatility of their firms' shares. Thus,

in periods of high volatility, one would expect to observe managers reducing their insider holdings. In periods of high volatility, one might also expect to observe firms increasing their level of disclosure if the volatility is caused, at least in part, by a greater amount of information being made available about them. This line of reasoning would predict an association between the occurrence of management earnings forecasts and insider sales, which is documented in Figure 1 and Table 4 in this paper. However, it does not predict any association between the occurrence of management earnings forecasts and insider purchases, which is documented in Figure 2 and Table 4 in this paper. Taken as a whole, the empirical findings in this paper are inconsistent with a volatility explanation for insider trading patterns around management earnings forecasts.

### *5.2 Characteristics of post-forecast insider transactions*

The previous section documents changes in the incidence of insider trading activity around management earnings forecasts. The findings indicate that insider transactions are delayed in advance of management earnings forecasts and concentrated in the post-forecast period. This section examines characteristics of those insider transactions that are made closely after management earnings forecasts.

The greater the expected loss incurred by market-makers from dealing with informed managers, the greater is the benefit from reducing managers' ability to trade in their own firms' shares without any restrictions. That is, market-makers are more likely to widen bid-ask spreads in response to insider trading by managers who have better opportunities of being privately informed. Consequently, the second

hypothesis of this paper predicts that post-forecast insider transactions should be positively related to empirical proxies for the possibility of a manager being privately informed. Finding support for this hypothesis would suggest that the information-related cost of insider trading activity increases with managers' level of private information. This increases the benefit of having insider transactions occur when information asymmetry is relatively low and makes concentrating insider transactions closely after management earnings forecast more likely. The model used to test this hypothesis takes the following form:

$$D\_MF_i = \alpha + \beta_1 SizeRel_i + \beta_2 D\_EA_i + \beta_3 D\_Reg_i + \beta_4 D\_Chairman_i + \beta_5 D\_Officer_i + \beta_6 D\_Officer \& Director_i + \varepsilon_i \quad (3)$$

Variable descriptions:

$D\_MF$  takes on the value of one (zero otherwise) if the insider transaction occurs within a twenty-trading-day window after a management earnings forecast. With this specification of the dependent variable, a positive coefficient on an independent variable can be interpreted as a greater likelihood of an insider transaction occurring in the post-forecast period relative to other periods. A four-week post-forecast window is chosen to correspond roughly to the number of weeks in Figures 1-3 where insider trading activity is relatively high. While this choice is somewhat arbitrary, it is consistent with the findings in Sivakumar and Waymire (1994). In addition, casual observation of the financial press reveals that it is not

uncommon for pre-specified insider trading windows after quarterly earnings announcements to be one month in length or longer. The findings in this paper are similar when this variable is defined using two- and three-week post-forecast windows.

*SizeRel* is computed as the natural log of transaction size in terms of number of shares divided by the number of shares outstanding in millions. The correlation between this variable and the likelihood of an insider transaction occurring in a post-forecast period is predicted to be positive. The rationale behind this prediction has to do with the losses market-makers expect to incur in dealing with managers. For a given level of private information, market-makers' expected losses on transactions with managers increase with the transaction size.

*D\_EA* takes on the value of one (zero otherwise) if the insider transaction occurs within a twenty-trading-day window after a quarterly earnings announcement. It is important to control for the effects of quarterly earnings announcements as they have been shown to influence insider trading activity. Quarterly earnings announcements, like management earnings forecasts, reduce information asymmetry and thus reduce the information-related cost of insider trading activity. If an insider transaction follows a quarterly earnings announcement, the importance of an insider transaction following a management earnings forecast is diminished. Thus, the correlation between *D\_EA* and the likelihood of an insider transaction occurring in a post-forecast period should be negative.

*D\_Chairman*, *D\_Officer*, and *D\_Officer&Director* take on the value of one (zero otherwise) if the insider transaction is made by a person with this corporate affiliation. The omitted category is directors. In general, officers are more involved than directors in the operations of their particular firm. If officers are perceived to be better able to earn abnormal profits on insider trading activity because of the nature of their position, the correlation between these variables and the likelihood of an insider transaction occurring in the period following a management earnings forecast should be positive.

*D\_Reg* takes on the value of one (zero otherwise) if the insider transaction occurs after the passage of the 1984 Insider Trading Sanctions Act. This act dramatically increased the penalties for insider trading violations after 1984.<sup>1</sup> *D\_Reg* is not predicted to be related to the possibility of a manager being privately informed. Rather, this variable is included in eq. (3) to test whether increased regulation has resulted in insider trading activity becoming more concentrated after corporate news events. This is the argument used by Sivakumar and Waymire (1994). They predict that the correlation between *D\_Reg* and the likelihood of an insider transaction occurring in the period following a management earnings forecast should be positive. However, if there are private benefits to firms from managers bonding their insider trading activity, such an insider trading pattern would be observed absent any regulation. The coefficient on *D\_Reg* would then be predicted to be zero.

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<sup>1</sup>See Appendix 1 for a detailed description of the regulation history of insider trading activity.



Table 5 provides Pearson correlation coefficients among the independent variables from eq. (3). The high levels of statistical significance associated with coefficients of such low magnitude primarily can be attributed to the large sample size. Notwithstanding, some of the signs on the coefficients have intuitive explanations. The correlation between *SizeRel* and *D\_Chairman* is 0.120 (two-sided *p*-value of 0.01) while the correlation between *SizeRel* and *D\_Officer* is -0.110 (two-sided *p*-value of 0.01). These findings are consistent with Panel B of Table 2 in which the position of chairman is associated with the highest mean transaction size while the position of officer is associated with the lowest. Another significant correlation coefficient is between *D\_Reg* and *SizeRel*. The coefficient is -0.270 (two-sided *p*-value of 0.01). In addition to being a regulation proxy, *D\_Reg* is also a rough proxy for where a sample transaction occurs in calendar time. This negative correlation is likely attributable to the fact that the sample firms generally increased their number of shares outstanding over the sampling interval, which would have the effect of increasing the denominator of *SizeRel*. Lastly, the correlations among the different categories of corporate affiliation are all negative. This is by construction as the categories are designed to be mutually exclusive.

**[Table 5]**

Panel A of Table 6 describes the findings of three separate logit estimations, as described by the model in eq. (3), that are used to identify characteristics of post-forecast insider sales, purchases, and acquisitions by exercise of options. Overall, the findings in Panel A broadly support the second hypothesis of this paper. First, larger

transactions relative to the number of shares outstanding are more likely to be made by managers in the period following a management earnings forecast date than in other periods. The coefficient on *SizeRel* is 0.156 (one-sided *p*-value of 0.01) for insider sales. The coefficient on this variable is 0.497 (one-sided *p*-value of 0.01) for insider purchases and 0.313 (one-sided *p*-value of 0.01) for insider acquisitions by exercise of options. These findings are consistent with larger insider transactions imposing greater transactions costs on investors. This increases firms' desire to have these transactions occur at times when information asymmetry is relatively low. As a result, they are concentrated after corporate news events such as management earnings forecasts.

**[Table 6]**

Second, insider transactions occurring after a quarterly earnings announcement are less likely to occur in the period following a management earnings forecast than in other periods. The coefficient on *D\_EA* is -0.507 (one-sided *p*-value of 0.01) for insider sales and -0.813 (one-sided *p*-value of 0.01) for insider acquisitions by exercise of options. The coefficient on this variable for insider purchases is not significant at conventional levels but does have the correct sign. These findings support the notion that quarterly earnings announcements are a way that investors receive information about firms. If an insider transaction follows a quarterly earnings announcement, the usefulness having this transaction occur after a management earnings forecast is diminished.

Third, officers are more likely than directors to engage in insider trading activity in the period following a management earnings forecast versus other periods. The coefficient on *D\_Officer* is 0.417 (one-sided *p*-value of 0.01) for insider sales and 0.495 (one-sided *p*-value of 0.01) for insider purchases. In addition, the coefficient on *D\_Officer&Director* is 0.322 (one-sided *p*-value of 0.02) for insider sales and 1.137 (one-sided *p*-value of 0.01) for insider purchases. As the omitted category for corporate affiliation is directors, these findings suggest that managers with greater involvement in day-to-day operations are perceived as being more likely to be informed in their insider trading decisions. Consequently, the benefit to firms of bonding the insider trading activity of these individuals increases. The coefficients on *D\_Chairman* for insider sales and purchases are positive but not significant at conventional levels. This finding is possibly explained by the fact that in some corporations the position of chairman is largely ceremonial, reducing the private information that these individuals are likely to possess. The insignificance on all of these coefficients for insider acquisitions by exercise of options is possibly due to the awarding of executive stock options to directors being such an infrequent event.

The support for *D\_Reg* is weak. Managers were only more likely to concentrate insider acquisitions by exercise of options in the period following a management earnings forecast versus other periods after the passage of the 1984 Insider Trading Sanctions Act. The coefficient on *D\_Reg* is 0.234 (one-sided *p*-value of 0.01) for insider acquisitions by exercise of options, but the coefficients on insider sales and purchases are not significant at conventional levels. These findings suggest

that the higher penalties for insider trading violations after 1984 did not significantly influence insider trading patterns with respect to timing around management earnings forecasts. Rather, these findings suggest that there are private incentives for investors and managers to reduce the information-related cost of insider trading activity.

A concern with the findings in Panel A of Table 6 relates to the relatively high levels of insider sales and acquisitions by exercise of options in February and August documented in Panel D of Table 3. These relatively high levels could potentially be a function of when executive stock options are awarded with respect to annual earnings announcements. Many firms make annual earnings announcements in February. If executive stock options are awarded around the same time and expiration dates are set on six-month or yearly intervals, managers that hold these options until expiration will have a higher incidence of insider acquisitions by exercise of options in February and August. In addition, for diversification reasons, managers might adjust their existing insider holdings in conjunction with these acquisitions.

As a robustness check on the findings in Panel A of Table 6, Panel B re-estimates the three logit models without 2,991 insider transactions from February and August. The relatively high level of insider sales and acquisitions by exercise of options in these two months could have unforeseen effects on the association between management earnings forecasts and insider trading activity if these insider transactions are mechanically related to the payout policy of executive compensation contracts. However, all coefficients retain their significance and inferences about the

independent variables remain unchanged, which suggests that seasonal effects in insider trading activity are not driving these findings.

### *5.3 Alternative hypothesis of managerial opportunism*

Much of the existing literature on insider trading activity focuses on documenting insider trading patterns that are consistent with managers using advance knowledge of information contained in corporate news events to their own advantage. In particular, Penman (1982) finds evidence of pre-forecast net insider trading activity having a positive association with the stock price reaction to subsequent management earnings forecasts. This opportunistic behavior by managers represents another possible explanation for changes in insider trading activity around management earnings forecasts. The third hypothesis of this paper attempts to replicate the findings from Penman (1982) to determine whether managerial opportunism can explain insider trading patterns around management earnings forecasts. If managers are exploiting private information for pre-forecast insider trading purposes, increased insider purchases and/or decreased insider sales should be observed in the period preceding “good news” forecasts. In addition, decreased insider purchases and/or increased insider sales should be observed in the period preceding “bad news” forecasts.

Figures 5 and 6 graphically illustrate the mean cumulative abnormal return around the sample of management earnings forecast dates. The sample dates in Figure 5 are categorized by pre-forecast net insider trading activity. Net insider trading activity is defined as the number of insider sales transactions minus the

number of insider purchase transactions, and the pre-forecast period is chosen to correspond to event days -20 through -1 relative to the sample dates. The choice of the pre-forecast period length is somewhat arbitrary, but the four-week interval is chosen to be as consistent as possible with the monthly insider trading data used in Penman (1982). The sample dates in Figure 6 are categorized by whether there is at least one insider acquisition by exercise of options in the pre-forecast period.

### [Figures 5 and 6]

Figures 5 and 6 allow for the assessment of the net profitability of insider transactions before management earnings forecasts. The findings from these two figures do not support the hypothesis of managers trading in their own firms' shares to earn abnormal profits on the information contained in upcoming management earnings forecasts. On average, managers do appear to be net insider sellers before "bad news" forecasts. However, the mean three-day cumulative abnormal return measured between event days -1 through +1 around the 206 management earnings forecast dates where managers are net insider sellers is -0.35% ( $t$ -statistic = -1.44), which is not significant in a one-sided test at conventional levels.<sup>1</sup> The 86 sample dates where managers are net insider buyers have a mean  $CAR(-1, +1)$  of -0.63% ( $t$ -statistic = -1.86). If pre-forecast insider transactions are the result of managerial opportunism, managers should be net insider buyers before "good news" forecasts, but this is not the case. The cumulative abnormal return plot for insider acquisitions

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<sup>1</sup>The statistical significance of this variable is assessed with a time-series  $t$ -statistic.

by exercise of options in Figure 6 looks very similar to that of net insider sales in Figure 5. There is no evidence of managers systematically exercising stock options in advance of “bad news” forecasts. The mean  $CAR(-1,+1)$  for sample dates with pre-forecast insider acquisitions by exercise of options is roughly zero.

Overall, the findings from Penman (1982) cannot be replicated on the sample of management earnings forecast dates in this paper, which raises the question of what is the source of the difference between these two sets of findings. It is likely the result of different sampling intervals. Penman (1982) uses a sample of management earnings forecasts collected between 1968-73. The sample dates from Pownall, Wasley, and Waymire (1993) cover the interval between 1979-87. Some highly publicized cases of illegal insider trading activity in the late 1970s and early 1980s brought managers’ insider trading practices under heightened scrutiny. In addition, the large increase in stock-based executive compensation throughout the 1980s made the potential scope of insider trading violations much larger. Both of these factors could have contributed to what appears to be a shift over time towards more concern by investors over the possibility of managers using private information for insider trading purposes.

A second way that managers can behave opportunistically with respect to insider trading activity is to use voluntary disclosures to deliberately mislead investors and profit on the resulting information asymmetry. It is unlikely that such behavior could persist as rational investors would see through such manipulation and managers quickly would get a reputation for providing inaccurate projections.

Nonetheless, this notion is investigated as another explanation for insider trading patterns around management earnings forecasts. The fourth hypothesis of this paper predicts that increased insider sales should be observed in the period following “good news” forecasts and increased insider purchases should be observed in the period following “bad news” forecasts.

Like Figures 5 and 6, Figures 7 and 8 graphically illustrate the mean cumulative abnormal return around the sample of management earnings forecast dates. However, the sample dates in Figure 7 are categorized by post-forecast net insider trading activity, and the sample dates in Figure 8 are categorized by whether there is at least one insider acquisition by exercise of options in the post-forecast period. The post-forecast period consists of event days +1 through +20 relative to the sample of management earnings forecast dates. These figures allow for the assessment of the net profitability of insider transactions after management earnings forecasts.

#### [Figures 7 and 8]

There is little evidence of insider transactions being made in an opportunistic manner after management earnings forecasts. The mean  $CAR(-1, +1)$  is roughly zero for the 257 sample dates after which managers are net insider sellers. Also, there are no subsequent decreases in share prices, which would be expected if investors became aware of any misleading forecasts over the next fifty trading days. The mean  $CAR(-1, +1)$  is -2.00% ( $t$ -statistic = -6.45) for the 106 sample dates after which managers are net insider buyers. Thus, it does appear that managers concentrate



insider purchases in periods after stock prices have declined. However, there is no evidence of reversals in share prices over the next fifty trading days, which would be expected if investors discovered that managers were being deceptive. The graph for insider acquisitions by exercise of options in Figure 8 is very similar to that for post-forecast net insider sales in Figure 7. There is no evidence of managers systematically exercising stock options after “good news” forecasts.

As a robustness check on the inferences drawn from Figures 7 and 8, Table 7 examines ex-post errors for a sub-set of the 1,211 management earnings forecasts used in this paper. Specifically, this sub-set of forecasts has predictions in either point or range formats. Ex-post errors are the predicted earnings amount from the management earnings forecast minus the realized earnings amount for the reporting period to which the prediction applies. The predicted earnings amount is set equal to the midpoint of upper and lower bounds for predictions in the range format. Examining ex-post errors for this sub-set of forecasts provides another means of assessing whether managers are making misleading voluntary disclosures. Predictions in either minimum or maximum formats are excluded from this analysis because of concern whether the predicted earnings amount for these observations represents an unbiased estimate of the realized earnings amount.

**[Table 7]**

The sub-set consists of 391 usable management earnings forecasts. This sub-set is further broken down in sub-groups based upon post-forecast net insider trading activity. Post-forecast net insider trading activity is measured in the same way as in

Figure 7. If managers are deliberately attempting to make misleading management earnings forecasts for insider trading purposes, managers should be net insider sellers after predictions that over-estimate realized earnings and net insider buyers after predictions that under-estimate realized earnings. However, these insider trading patterns are not apparent in the findings from Table 7. All three sub-groups of post-forecast net insider trading activity have a median ex-post error that is equal to or less than \$0.01. Thus, it does not appear that managers are trying to systematically mislead investors with their forecasts.

However, it should be noted that insider transactions can be made in an opportunistic manner after management earnings forecasts even if managers do not make deliberately misleading statements. If managers have decided to trade in a certain direction, to behave opportunistically, they will make voluntary disclosures only if they have information that will affect shares prices in their favor. This argument results in the same testable predictions that are stated in the fourth hypothesis of this paper. Insider sales would be expected after “good news” forecasts and insider purchases would be expected after “bad news” forecasts, but empirical support for this hypothesis is mixed.

#### 5.4 *Examining the issue of association vs. causality*

The argument underlying the first two hypotheses in this paper does not necessarily imply that voluntary disclosures are the result of managers wanting to trade in the shares of their own firms. Rather, voluntary disclosures are taken as exogenous events. Hypotheses are then generated regarding how insider transactions

would be timed relative to these corporate news events to mitigate the information-related cost of insider trading activity. However, managers wanting to trade in their own firms' shares is a potential motivation for making voluntary disclosures. The fifth hypothesis of this paper investigates this issue of causality by using the finding from Sivakumar and Waymire (1994) that the incidence of insider trading activity is relatively high after quarterly earnings announcements.

Specifically, the period following quarterly earnings announcements is used as a benchmark to determine whether management earnings forecasts are issued at times when the demand to engage in insider trading activity is relatively high. For every sample firm, the level of post-announcement insider trading activity for those quarterly earnings announcements that occur near management earnings forecasts is compared to the level for all other quarterly earnings announcements. If management earnings forecasts are issued for a reason unrelated to insider trading activity, one would not expect a relatively high incidence of insider trading activity after quarterly earnings announcements that are located near these predictions. However, if management earnings forecasts are being issued in response to a desire by managers to trade in the shares of their own firms, this increased desire could also be manifested in the period after quarterly earnings announcements that are located near these forecasts. Increased use of what appears to be widely regarded as an acceptable insider trading "window" would provide indirect evidence of management earnings forecasts being made when the demand to engage in insider trading activity is relatively high.

Table 8 describes the findings of an OLS regression model that is used to assess the statistical significance of changes in insider trading activity after those quarterly earnings announcements that occur near management earnings forecasts. Three OLS time-series regressions are estimated for every sample firm using 2,150 trading days between 7/1/79 and 12/31/87. The dependent variables are the daily number of insider sales, purchases, and acquisitions by exercise of options. Table 8 provides cross-sectional averages of the estimated coefficients from these regressions. The basic technique is identical to that used in Table 4. The model used to test the fifth hypothesis of this paper takes the following form:

$$\begin{aligned} \text{InsSales}_t, \text{InsPurchases}_t, \text{ or } \text{InsOptions}_t = & \alpha + \gamma_1 D\_PreEA_t + \gamma_2 D\_PostEA_t \\ & + \delta D\_Change_t + \varepsilon_t \end{aligned} \quad (4)$$

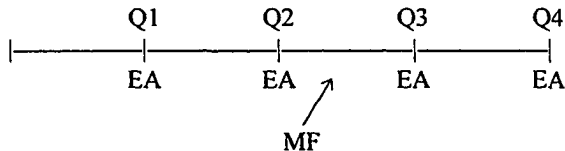
where day  $t$  is between 7/1/79 and 12/31/87

Variable descriptions:

*InsSales*, *InsPurchases*, and *InsOptions* are the daily number of insider sales, purchases, and acquisitions by exercise of options.

$D\_PreEA$  takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window before a quarterly earnings announcement;  $D\_PostEA$  takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window after a quarterly earnings announcement.

*D\_Change* takes on the value of one (zero otherwise) if 1.) day  $t$  is within a twenty-trading-day window after a quarterly earnings announcement that is on either side of a management earnings forecast (depicted in the diagram below by Q2 and Q3), 2.) the management earnings forecast in question is not within twenty trading days of a quarterly earnings announcement, and 3.) there is at least one insider transaction of the same type as the dependent variable within a twenty-trading-day window after the management earnings forecast in question.



Some aspects of the specification for *D\_Change* require further clarification. This independent variable is constructed to measure changes in the incidence of a given type of insider transaction after quarterly earnings announcements conditional on that type of insider transaction also having occurred after a near management earnings forecast. For example, *D\_Change* is used to determine whether management earnings forecasts with post-forecast insider sales are issued at times when nearby quarterly earnings announcements also experience relatively high post-announcement insider sales. The restriction on where management earnings forecasts can occur in a quarter is necessary to prevent *D\_Change* from being mechanically biased towards statistical significance. The cost of this restriction is that it does limit the generalizability of the findings in this section.

The findings from Table 8 provide support for the fifth hypothesis of this paper. Management earnings forecasts with a given type of post-forecast insider transaction appear to be issued at times when the incidence of that type of insider transaction is at relatively high levels after nearby quarterly earnings announcements. The coefficient on *D\_Change* is positive for all three types of insider transactions. It is 0.0076 (one-sided *p*-value of 0.04) for insider sales, 0.0025 (one-sided *p*-value of 0.16) for insider purchases, and 0.0065 (one-sided *p*-value of 0.05) for insider acquisitions by exercise of options. The magnitude of these coefficients represent an average increase of 25% over the unconditional level of post-announcement insider trading activity. This unconditional level of post-announcement insider trading activity is measured by the sum of the coefficient on *D\_PostEA* and the regression intercept for each type of transaction. Overall, these findings provide indirect evidence that management earnings forecasts are issued when the demand to engage in insider trading activity is relatively high. Moreover, these findings lend support to the argument that at least some management earnings forecasts result from the desire of managers to trade in their own firms' shares.

**[Table 8]**

As in Table 4, the coefficients on *D\_PostEA* confirm the finding in Sivakumar and Waymire (1994) that insider trading is relatively high after quarterly earnings announcements. The coefficient on *D\_PostEA* is 0.0093 (one-sided *p*-value of 0.01) for insider sales and 0.0030 (one-sided *p*-value of 0.01) for insider purchases. Insider acquisitions by exercise of options display a similar pattern with a coefficient on

$D\_PostEA$  of 0.0108 (one-sided  $p$ -value of 0.01). The pre-announcement declines for each type of transaction are also similar to Table 4 except that the coefficient on  $D\_PreEA$  for insider acquisitions by exercise of options is negative. The coefficient on  $D\_PreEA$  is -0.0027 (one-sided  $p$ -value of 0.01) for insider acquisitions by exercise of options. Insider sales experience a significant pre-announcement reduction, but insider purchases do not. The coefficient on  $D\_PreEA$  is -0.0079 (one

## Chapter 6 Summary

This paper investigates insider trading patterns around management earnings forecasts to determine whether managers use corporate news events to bond themselves against exploiting private information for insider trading purposes. Overall, the empirical evidence supports this hypothesis. The incidence of insider trading activity is relatively low prior to management earnings forecasts and increases afterwards. In addition, the likelihood of an insider transaction occurring in the period following management earnings forecasts is related to empirical proxies for the possibility of a manager being privately informed. Robustness checks on these findings are not consistent with alternative explanations for observed insider trading patterns. In particular, managerial opportunism arguments are not supported.

This paper contributes to existing research on both voluntary disclosures and insider trading activity. First, it extends the findings in Sivakumar and Waymire (1994) regarding insider trading patterns around quarterly earnings announcements. Specifically, the findings in this paper suggest that managers take advantage of voluntary disclosures to make insider transactions in periods of relatively low information asymmetry. Furthermore, managers' insider trading decisions appear to be driven more by private contracting incentives than regulatory constraints as argued in Sivakumar and Waymire (1994). Second, no support is found for the findings in Penman (1982). Arguments that insider trading patterns around management earnings forecasts are being driven by managers using foreknowledge of the information contained in these predictions to earn abnormal profits is now subject to



debate. Third, this paper offers another potential explanation for why firms might want to make voluntary disclosures. It presents evidence consistent with firms issuing management earnings forecasts when managers' demand to trade in their own firms' shares is relatively high.

This paper suggests several interesting avenues for future research. First, the corporate policy of restricting insider transactions to pre-specified windows has not been investigated. Exploring in more detail the types of firms that have such a policy could provide some additional insight into the costs of voluntary disclosures versus the benefits of insider trading activity and the tradeoffs that firms are making along this dimension. Next, collecting a sample of firms that have specific insider trading windows would provide an excellent opportunity to test different market micro-structure hypotheses relating transactions costs to the proportionate number of informed traders in securities markets. This would provide some time-series evidence to contrast the mostly cross-sectional work done in this area of the finance literature.

## **Appendix 1 Regulation Background**

### *A1.1 Insider trading activity*

The first attempt to regulate insider trading activity in the US was the Securities and Exchange (S&E) Act of 1934.<sup>1</sup> Historically, insider trading activity had generally been permitted under common law irrespective of the nature of information possessed. Defining “insiders” as officers, directors, and large investors, Section 16 of the 1934 S&E Act prohibits these individuals from short selling and requires them to return any profits earned from holding a position for less than six months. However, it was not until 1961, when the Securities and Exchange Commission (SEC) took official action against Cady, Roberts, and Co., that the information environment surrounding insider transactions became an issue.

Section 10b of the 1934 S&E Act together with SEC Rule 10b-5 formed the core of the SEC’s position with respect to this action. The relevant portion of Rule 10b-5 declares that it is unlawful “to make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in light of the circumstances in which they were made, not misleading.” The SEC interpreted the previous statement as providing managers or other affiliated persons with an affirmative duty to disclose “material” information or refrain from engaging in insider trading activity. It maintained that insider trading activity based upon

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<sup>1</sup>See Carlton and Fischel (1983) and Bloomenthal (1995) for summaries on the regulation of insider trading activity.

undisclosed “material” information should not be permitted because 1.) inside information was intended to benefit firms rather than individuals and 2.) it was “unfair” to investors. Legal precedent for this point of view was later established in *SEC v. Texas Gulf Sulphur Co.* (1968).

During the 1980s, Congress dramatically increased penalties to illegal insider trading activity. The Insider Trading Sanctions Act of 1984 raised maximum criminal fines from \$10,000 to \$100,000 and allows for civil damages of up to three times the amount of profits earned. The Insider Trading Sanctions and Enforcement Act of 1988 further raised maximum criminal fines to \$1,000,000 and increased the maximum jail term from five to ten years.

#### *A1.2 Voluntary disclosures*

The last two decades have seen a regulatory shift towards supporting voluntary disclosures. In 1973, the SEC reversed its “exclusionary” policy, which prohibited including corporate projections in SEC filings.<sup>2</sup> The rationale behind this long-standing policy was that forward-looking financial information lacked credibility due to the potential for manipulation. In 1979, the SEC instituted the “safe harbor” rule to prevent investors from filing charges of fraud for what ended up being inaccurate corporate projections. However, the vague nature of this rule resulted in firms that disclosed forward-looking financial information not being completely

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<sup>2</sup>See King, Pownall, and Waymire (1990) and Francis, Philbrick, and Schipper (1994a) for summaries on the regulation of voluntary disclosures.

protected against securities-fraud lawsuits. In 1995, Congress passed legislation that places limits on securities-fraud lawsuits. The recently passed law makes it more difficult for investors to sue firms for what turn out to be inaccurate corporate projections as long as they are accompanied by a description of factors that might affect results.

**Bibliography**

- Ajinkya, B., and M. Gift, 1984, Corporate managers' earnings forecasts and symmetrical adjustments of market expectations, *Journal of Accounting Research* 22, 425-444.
- Alexander, J., 1991, Do merits matter? A study of settlements in securities class actions, *Stanford Law Review* 43, 497-598.
- Barclay, M., and C. Smith, 1988, Corporate payout policy: cash dividends versus open-market repurchases, *Journal of Financial Economics* 22, 61-82.
- Bloomenthal, H., 1995, *Securities Law Handbook*, Clark, Boardman, and Callaghan, Deerfield, IL.
- Carlton, D., and D. Fischel, 1983, The regulation of insider trading, *Stanford Law Review* 35, 857-895.
- Cox, C., 1985, Further evidence on the representativeness of management earnings forecasts, *The Accounting Review* 60, 692-701.
- Elliott, J., D. Morse, and G. Richardson, 1984, The association between insider trading and information announcements, *Rand Journal of Economics* 15, 521-536.
- Finnerty, J., 1976a, Insiders' activity and insider information: A multivariate analysis, *Journal of Financial and Quantitative Analysis* 11, 205-216.
- Finnerty, J., 1976b, Insiders and market efficiency, *Journal of Finance* 31, 1141-1148.
- Francis, J., D. Philbrick, and K. Schipper, 1994a, Shareholder litigation and corporate disclosure, *Journal of Accounting Research* 32, 137-164.
- Francis, J., D. Philbrick, and K. Schipper, 1994b, Determinants and outcomes in class action securities litigation, working paper, University of Chicago and Portland State University.
- Frankel, R., M. McNichols, and P. Wilson, 1995, Discretionary disclosure and external financing, *The Accounting Review* 70, 135-150.
- Givoly, D., and D. Palmon, 1985, Insider trading and the exploitation of inside information: Some empirical evidence, *Journal of Business* 58, 69-87.

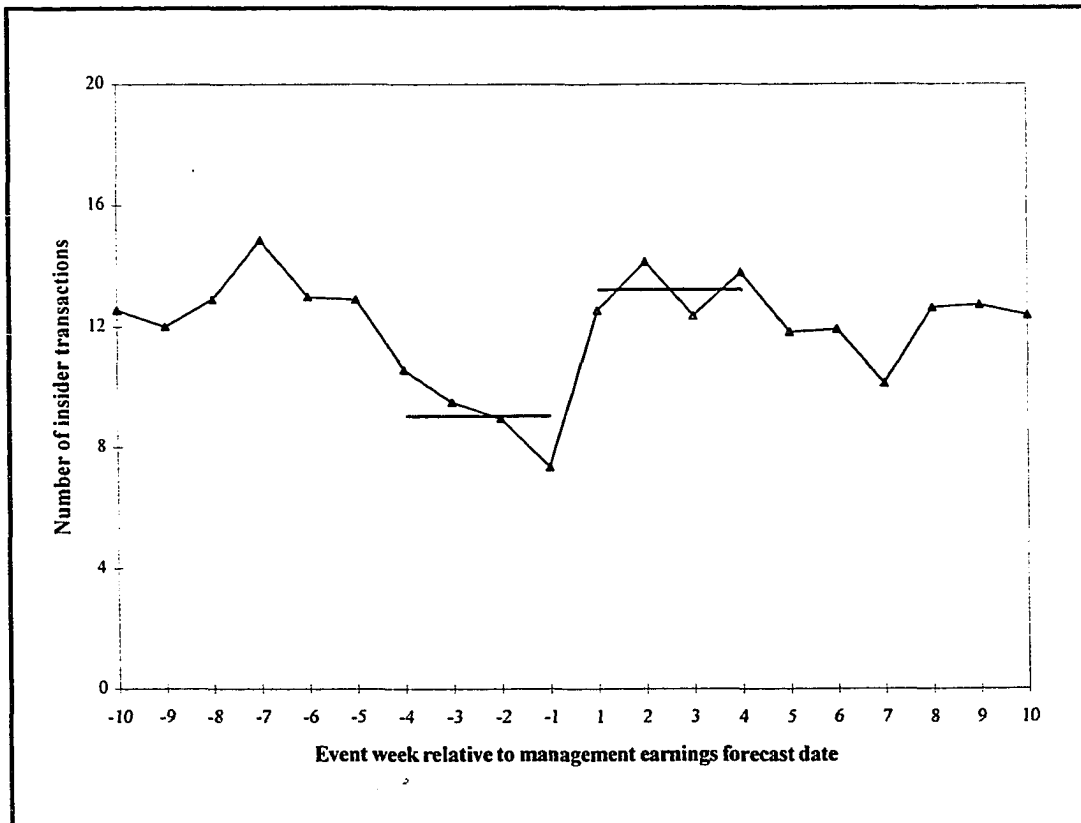
- Glosten, L., and P. Milgrom, 1985, Bid, ask, and transaction prices in a specialist market with heterogeneously informed traders, *Journal of Financial Economics* 14, 71-100.
- Healy, P., K. Palepu, and A. Sweeney, 1995, Do firms benefit from expanded voluntary disclosure?, working paper, Harvard Business School and MIT.
- Hirschey, M., and J. Zaima, 1989, Insider trading, ownership structure, and the market assessment of corporate sell-offs, *Journal of Finance* 44, 971-980.
- Jaffe, J., 1974, Special information and inside information, *Journal of Business* 47, 410-428.
- Jensen, M. and W. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs, and ownership structure, *Journal of Financial Economics* 3, 305-360.
- John, K., and L. Lang, 1991, Strategic insider trading around dividend announcements: Theory and evidence, *Journal of Finance* 46, 1361-1389.
- Karpov, J., and D. Lee, 1991, Insider trading before new issue announcements, *Financial Management* 20, 18-26.
- Kellogg, R., 1984, Accounting activities, security prices, and class action lawsuits, *Journal of Accounting and Economics* 6, 185-204.
- King, R., G. Pownall, and G. Waymire, 1990, Expectations adjustment via timely management forecasts: Review, synthesis, and suggestions for future research, *Journal of Accounting Literature* 9, 113-144.
- Lang, M., and R. Lundholm, 1993, Cross-sectional determinants of analyst ratings of corporate disclosures, *Journal of Accounting Research* 31, 246-271.
- Lee, D.S., W. Mikkleson, and M.M. Partch, 1992, Managers' trading around stock repurchases, *Journal of Finance* 47, 1947-1961.
- Lee, C., B. Mucklow, and M. Ready, 1993, Spreads, depths, and the impact of earnings information: An intra-day analysis, *The Review of Financial Studies* 6, 345-374.
- Leftwich, R., R. Watts, and J. Zimmerman, Voluntary corporate disclosure: The case for interim reporting, *Journal of Accounting Research* 19 Supplement, 50-77.

- Lev, B., and R. Kasznik, 1995, To warn or not to warn: Management disclosures in the face of an earnings surprise, *The Accounting Review* 70, 113-134.
- Lev, B., and S. Penman, 1990, Voluntary forecast disclosure, nondisclosure and stock prices, *Journal of Accounting Research* 28, 49-76.
- Loderer, C., and D. Sheehan, 1989, Corporate bankruptcy and managers' self-serving behavior, *Journal of Finance* 44, 1059-1075.
- McNichols, M., 1989, Evidence of informational asymmetries from management earnings forecasts and stock returns, *The Accounting Review* 64, 1-27.
- Meulbroek, L., 1992, An empirical analysis of illegal insider trading, *Journal of Finance* 47, 1661-1700.
- Patell, J., 1976, Corporate forecasts of earnings per share and stock price behavior: Empirical tests, *Journal of Accounting Research* 14, 246-276.
- Penman, S., 1980, An empirical investigation of the voluntary disclosure of corporate earnings forecasts, *Journal of Accounting Research* 18, 132-160.
- Penman, S., 1982, Insider trading and the dissemination of firms' forecast information, *Journal of Business* 55, 479-503.
- Pownall, G., C. Wasley, and G. Waymire, 1993, The stock price effects of alternative types of management earnings forecasts, *The Accounting Review* 68, 896-912.
- Pownall, G., and G. Waymire, 1989a, Voluntary disclosure credibility and securities prices: Evidence from management earnings forecasts: 1969-73, *Journal of Accounting Research* 27, 227-245.
- Ruland, W., S. Tung, and N. George, 1990, Factors associated with the disclosure of managers' forecasts, *The Accounting Review*, 710-721.
- Scholes, M., and J. Williams, 1977, Estimating betas from non-synchronous data, *Journal of Financial Economics* 5, 309-328.
- Seyhun, H.N., 1986, Insiders' profits, costs of trading, and market efficiency, *Journal of Financial Economics* 16, 189-212.
- Seyhun, H.N., 1988, The information content of aggregate insider trading, *The Journal of Business* 61, 1-24.

- Seyhun, H.N., 1990, Do bidder managers knowingly pay too much for the target firms?, *Journal of Business* 63, 439-464.
- Sivakumar, K., and G. Waymire, 1994, Insider trading following material news events: evidence from earnings, *Financial Management* (Spring 1994), 23-32.
- Skinner, D., 1994a, Why firms voluntarily disclose bad news, *Journal of Accounting Research* 32, 38-60.
- Skinner, D., 1994b, Empirical evidence on the relation between earnings disclosures, firm characteristics, and stockholder lawsuits, working paper, University of Michigan.
- Sloan, R., 1993, Accounting earnings and top executive compensation, *Journal of Accounting and Economics* 16, 55-100.
- Trueman, B., 1986, Why do managers voluntarily release earnings forecasts?, *Journal of Accounting and Economics* 8, 53-71.
- Verrecchia, R., 1983, Discretionary disclosure, *Journal of Accounting and Economics* 5, 179-194.
- Verrecchia, R., 1990, Information quality and discretionary disclosure, *Journal of Accounting and Economics* 12, 1990, 365-380.
- Watts, R. and J. Zimmerman, 1986, *Positive accounting theory*, Prentice Hall, Englewood Cliffs, NJ.
- Waymire, G., 1984, Additional evidence of the information content of management earnings forecasts, *Journal of Accounting Research* 22, 703-18.



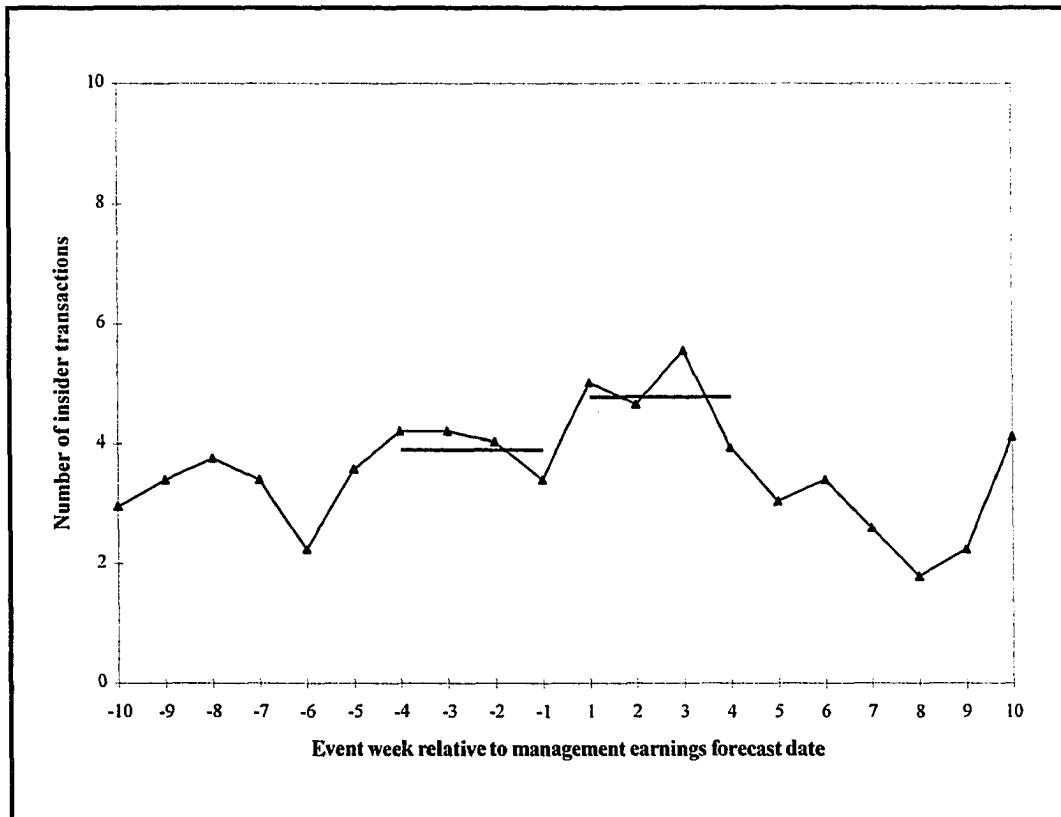
**Figure 1**  
**Number of insider sales per week around 949 management earnings forecast dates<sup>1,2</sup>**



<sup>1</sup>Event week -10 corresponds to event days -50 through -46 relative to the management earnings forecast date;...event week +1 corresponds to event days 0 through +4 relative to the management earnings forecast date;...event week +10 corresponds to event days +44 through +49 relative to the management earnings forecast date.

<sup>2</sup>The horizontal lines represent averages of the number of insider sales per week for event weeks -4 through -1 and event weeks +1 through +4.

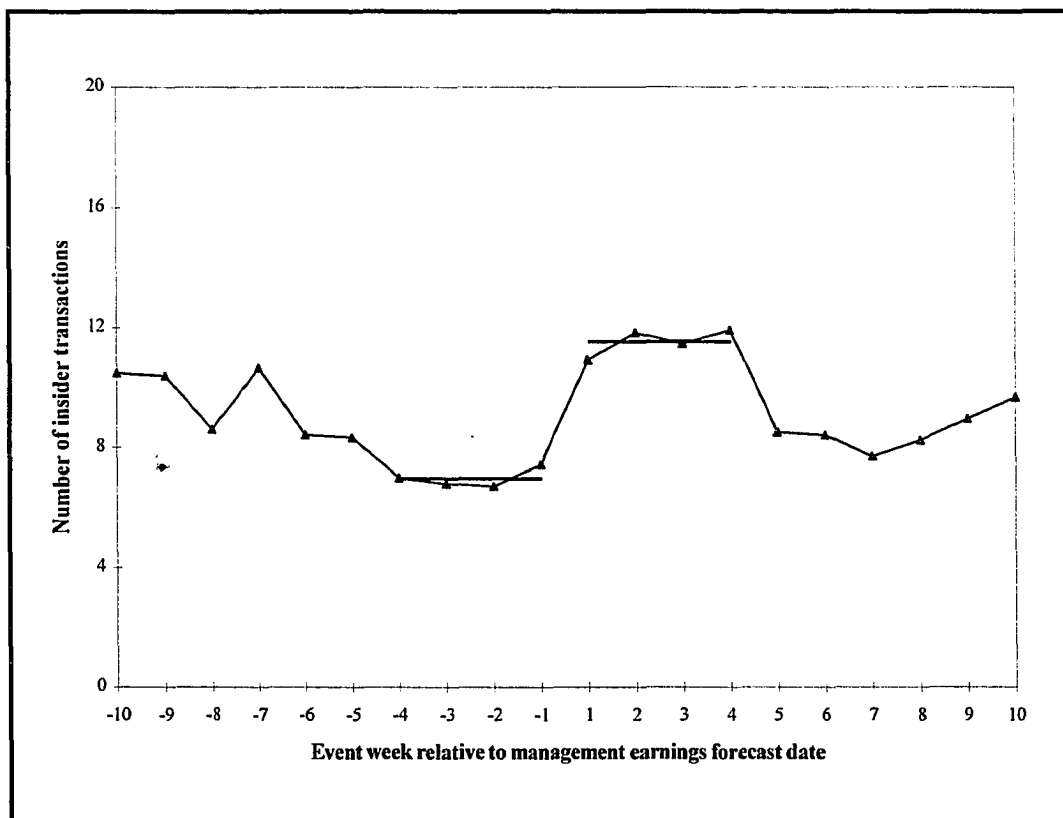
**Figure 2**  
**Number of insider purchases per week around 949 management earnings forecast dates<sup>1,2</sup>**



<sup>1</sup>Event week -10 corresponds to event days -50 through -46 relative to the management earnings forecast date;...event week +1 corresponds to event days 0 through +4 relative to the management earnings forecast date;...event week +10 corresponds to event days +44 through +49 relative to the management earnings forecast date.

<sup>2</sup>The horizontal lines represent averages of the number of insider purchases per week for event weeks -4 through -1 and event weeks +1 through +4.

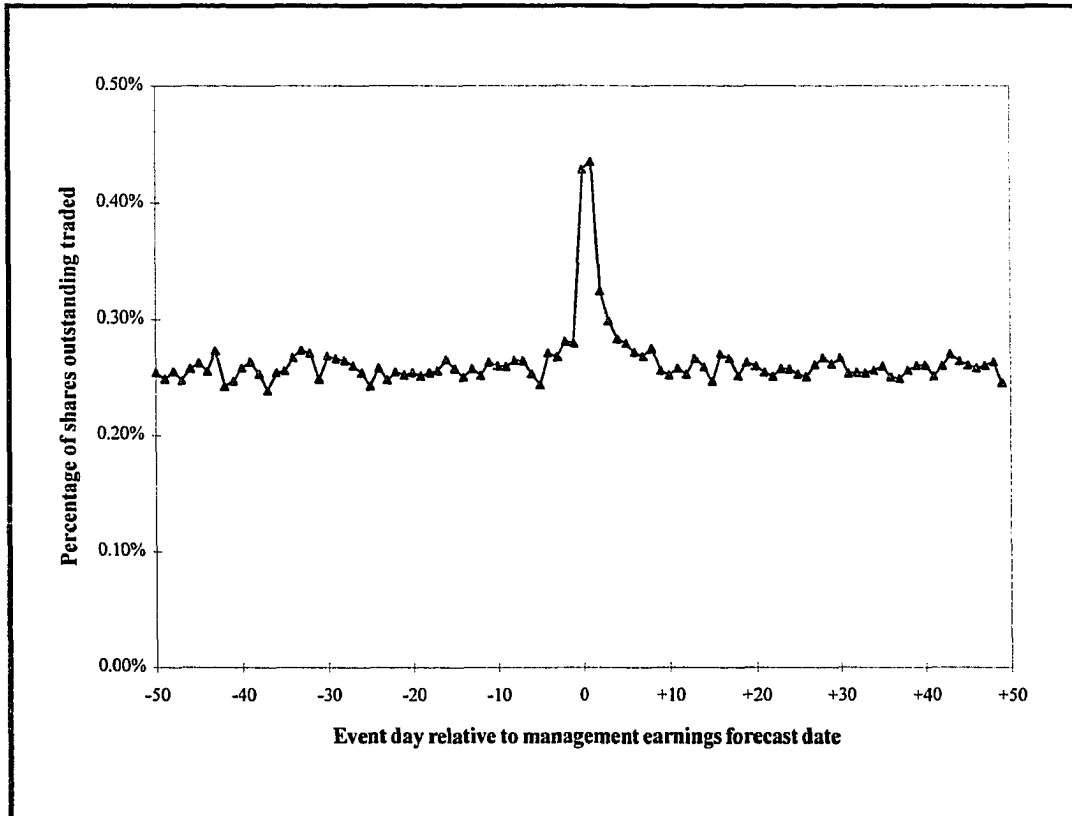
**Figure 3**  
**Number of insider acquisitions by exercise of options per week**  
**around 949 management earnings forecast dates<sup>1,2</sup>**



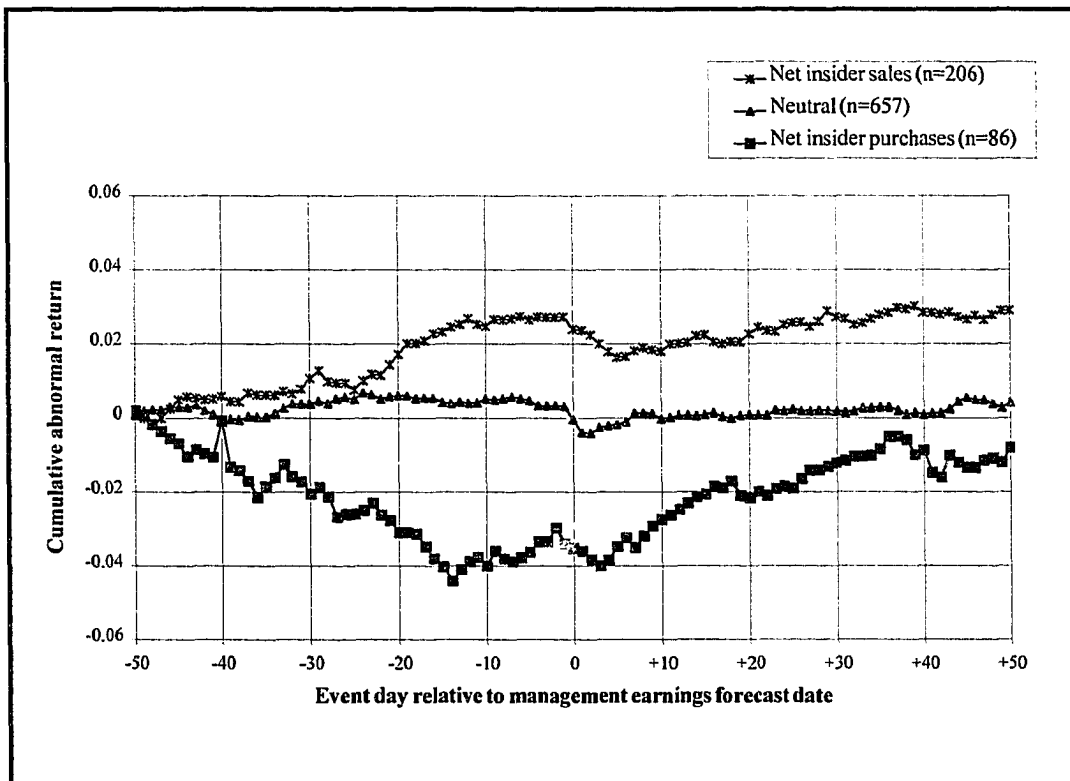
<sup>1</sup>Event week -10 corresponds to event days -50 through -46 relative to the management earnings forecast date;...event week +1 corresponds to event days 0 through +4 relative to the management earnings forecast date;...event week +10 corresponds to event days +44 through +49 relative to the management earnings forecast date.

<sup>2</sup>The horizontal lines represent averages of the number of insider acquisitions by exercise of options per week for event weeks -4 through -1 and event weeks +1 through +4.

**Figure 4**  
**Mean daily total trading volume around 949 management**  
**earnings forecast dates**



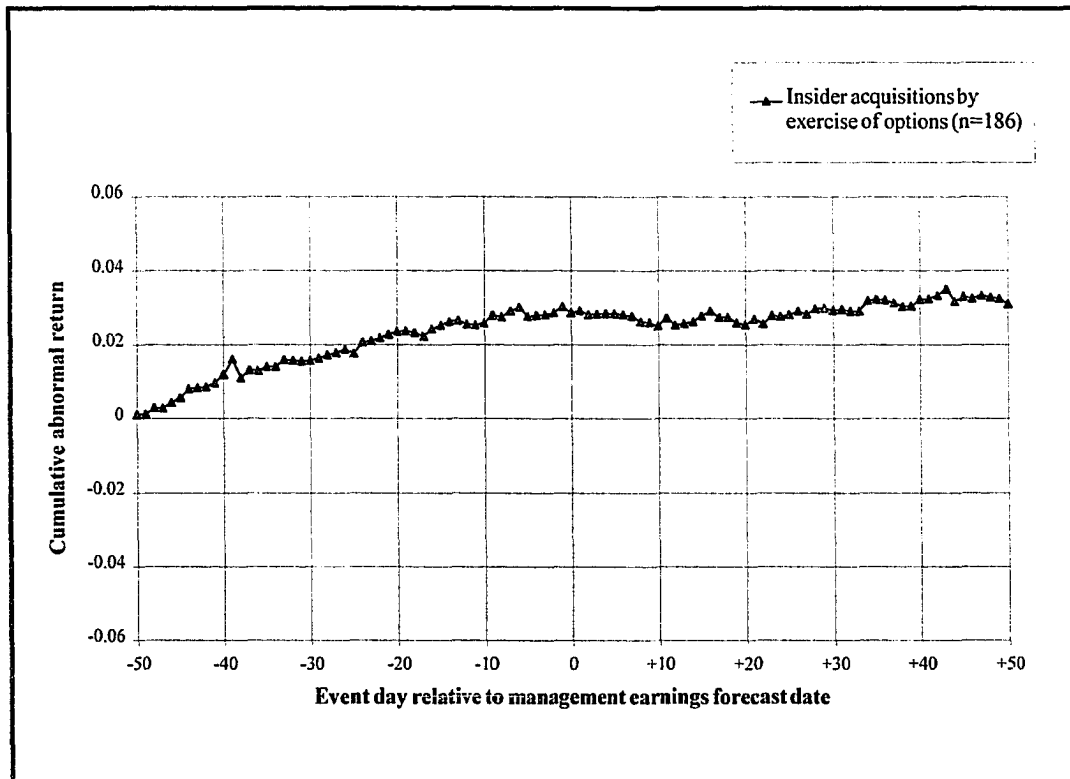
**Figure 5**  
**Mean cumulative abnormal return around 949 management earnings forecast**  
**dates categorized by pre-forecast net insider trading activity<sup>1,2</sup>**



<sup>1</sup>The pre-forecast period consists of event days -20 through -1 relative to the management earnings forecast date. Net insider trading activity is defined as the number of insider sales transactions minus the number of insider purchase transactions.

<sup>2</sup>A daily abnormal return is defined as the difference between an individual stock return and the return on the CRSP value-weighted NYSE/AMEX index.

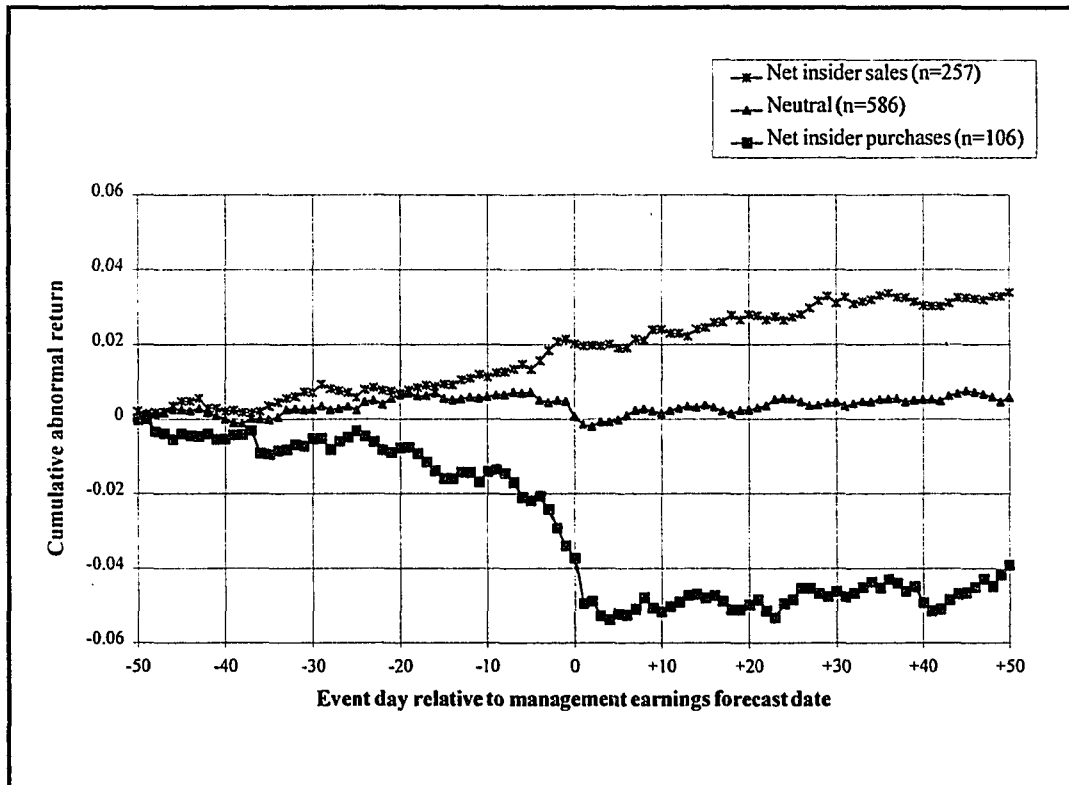
**Figure 6**  
**Mean cumulative abnormal return around sub-set of 949 management earnings forecast dates with pre-forecast insider acquisitions by exercise of options<sup>1,2</sup>**



<sup>1</sup>The pre-forecast period consists of event days -20 through -1 relative to the management earnings forecast date.

<sup>2</sup>A daily abnormal return is defined as the difference between an individual stock return and the return on the CRSP value-weighted NYSE/AMEX index.

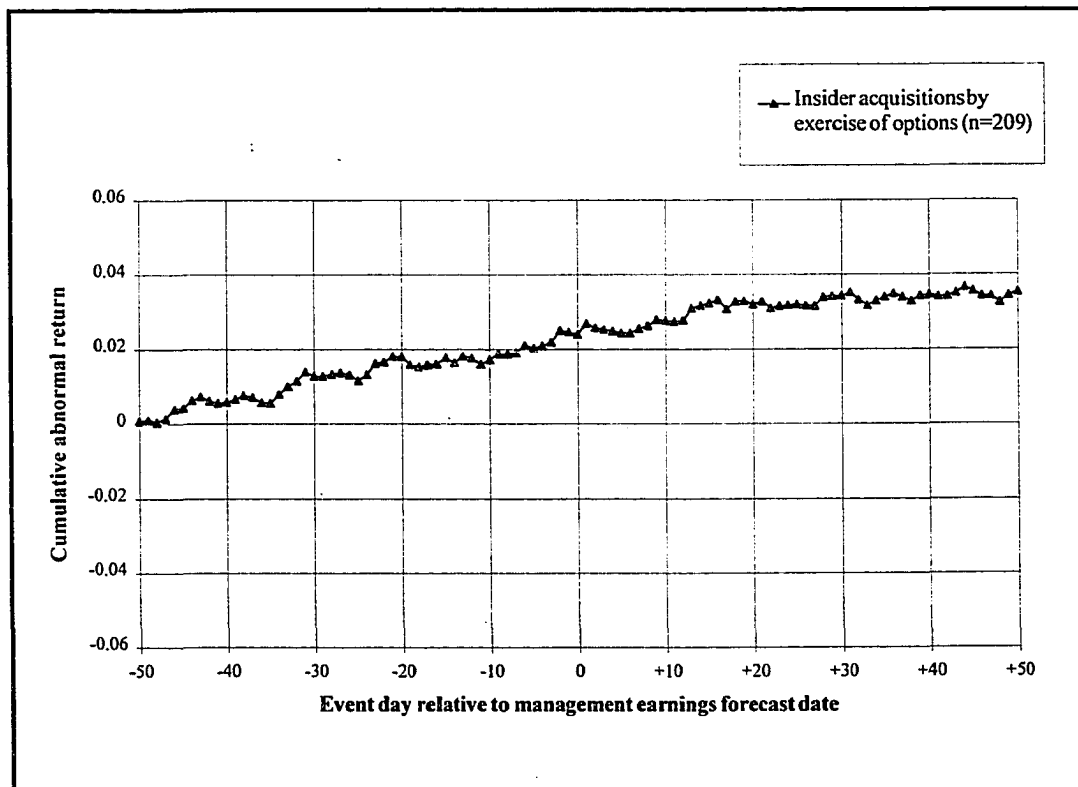
**Figure 7**  
**Mean cumulative abnormal return around 949 management earnings forecast**  
**dates categorized by post-forecast net insider trading activity<sup>1,2</sup>**



<sup>1</sup>The post-forecast period consists of event days +1 through +20 relative to the management earnings forecast date. Net insider trading activity is defined as the number of insider sales transactions minus the number of insider purchase transactions.

<sup>2</sup>A daily abnormal return is defined as the difference between an individual stock return and the return on the CRSP value-weighted NYSE/AMEX index.

**Figure 8**  
**Mean cumulative abnormal return around sub-set of 949 management earnings forecast dates with post-forecast insider acquisitions by exercise of options<sup>1,2</sup>**



<sup>1</sup>The post-forecast period consists of event days +1 through +20 relative to the management earnings forecast date.

<sup>2</sup>A daily abnormal return is defined as the difference between an individual stock return and the return on the CRSP value-weighted NYSE/AMEX index.



**Table 1**  
**Summary statistics for 85 sample firms**

| <i>Variable</i>                                  | <i>N</i> <sup>1</sup> | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|--|-----------------------|-------------|---------------|-----------|-----------|
| <i>Market value of equity</i> <sup>2</sup> (\$M) | 756                   | 1,247       | 456           | 1,225     | 158       |
| <i>Annual stock return</i> <sup>3</sup> (%)      | 765                   | 21.8        | 16.6          | 39.4      | 9.8       |
| <i>Beta</i> <sup>4</sup>                         | 765                   | 1.02        | 0.98          | 1.27      | 0.74      |
| <i>Market-to-book ratio</i> <sup>5</sup>         | 755                   | 1.48        | 1.21          | 1.83      | 0.83      |
| <i>Leverage ratio</i> <sup>6</sup> (%)           | 756                   | 17.9        | 17.5          | 24.2      | 9.8       |

<sup>1</sup>number of firm years with available data

<sup>2</sup>*Market value of equity* is computed as the fiscal-year-end stock price multiplied by the fiscal-year-end number of shares outstanding for fiscal years 1978-86.

<sup>3</sup>*Annual stock return* is computed for calendar years 1979-87.

<sup>4</sup>*Beta* is estimated for calendar years 1979-87. See Scholes and Williams (1977) for information about the estimation method.

<sup>5</sup>*Market-to-book ratio* is computed as the market value of equity divided by the book value of equity for fiscal years 1978-86.

<sup>6</sup>*Leverage ratio* is computed as the book value of long-term debt divided by the book value of total assets for fiscal years 1978-86.

**Table 2**  
**Summary statistics for 949 management earnings forecast dates**  
**of 85 sample firms between 7/1/79 and 12/31/87**

**Panel A.** This panel provides information on forecast horizon and three-day cumulative abnormal return for the sample.

| <i>Variable</i>                       | <i>N</i> <sup>1</sup> | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|---------------------------------------|-----------------------|-------------|---------------|-----------|-----------|
| <i>Horizon1</i> <sup>2</sup> (# days) | 948                   | 116.3       | 113           | 177       | 45        |
| <i>Horizon2</i> <sup>3</sup> (# days) | 924                   | 19.7        | 13            | 35        | 1         |
| <i>CAR(-1, +1)</i> <sup>4</sup> (%)   | 949                   | -0.66       | -0.26         | 2.19      | -2.74     |

**Panel B.** This panel describes the distribution of the sample across firms.

| <i>Variable</i>  | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|--|-------------|---------------|-----------|-----------|
| <i># of mgt. earnings forecast dates per firm over sampling interval</i> | 11.2        | 9             | 15        | 7         |

Table 2 cont.

**Panel C.** This panel describes the distribution of the sample across time.

*Mean number of mgt. earnings forecast dates per month by calendar year*

| 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|------|------|------|------|------|------|------|------|------|
| 8.5  | 10.6 | 10.0 | 9.1  | 10.6 | 8.3  | 10.5 | 7.9  | 7.8  |

*Mean number of mgt. earnings forecast dates by calendar month*

| Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|------|------|------|------|-----|------|------|------|------|------|------|------|
| 6.4  | 8.3  | 6.8  | 15.0 | 7.9 | 11.9 | 10.2 | 5.8  | 7.6  | 15.0 | 6.0  | 11.0 |

*Mean number of mgt. earnings forecast dates by month relative to fiscal year end*

| -11 | -10  | -9  | -8   | -7  | -6  | -5   | -4  | -3  | -2   | -1  | 0   |
|-----|------|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| 5.5 | 10.9 | 7.3 | 18.4 | 8.6 | 9.9 | 11.4 | 3.9 | 6.0 | 14.8 | 5.0 | 9.9 |

<sup>1</sup>number of management earnings forecast dates with available data

<sup>2</sup>*Horizon1* is the number of trading days between the management earnings forecast date and the final day of the reporting period to which the prediction applies. If there is more than one prediction on the management earnings forecast date, this variable is calculated separately for each of them and is set equal to the maximum of these values.

<sup>3</sup>*Horizon2* is the number of trading days between the management earnings forecast date and the date of the next quarterly earnings announcement.

<sup>4</sup>*CAR(-1,+1)* is the three-day cumulative abnormal return measured between event days -1 through +1 relative to the management earnings forecast date. This variable is calculated by summing daily abnormal returns. A daily abnormal return is defined as the difference between an individual stock return and the return on the CRSP value-weighted NYSE/AMEX index.

**Table 3**  
**Summary statistics for 10,682 insider transactions**  
**of 85 sample firms between 4/1/79 and 3/31/88**

**Panel A.** This panel provides information on transaction size for the sample in terms of number of shares, broken down by type of transaction.

| <i>Variable</i>                   |  | <i>N</i> | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|-----------------------------------|--|----------|-------------|---------------|-----------|-----------|
| <i>Transaction size (# shrs.)</i> | <i>Insider sales</i>                               | 5,538    | 3,740       | 1,190         | 3,200     | 500       |
|                                   | <i>Insider purchases</i>                           | 1,716    | 2,274       | 250           | 1,000     | 100       |
|                                   | <i>Insider acquisitions by exercise of options</i> | 3,428    | 4,810       | 2,000         | 4,843     | 722       |
|                                   |  | 10,682   |             |               |           |           |

**Panel B.** This panel provides information on transaction size for the sample in terms of number of shares, broken down by corporate affiliation.

| <i>Variable</i>                   |                               | <i>N</i> | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|-----------------------------------|-------------------------------|----------|-------------|---------------|-----------|-----------|
| <i>Transaction size (# shrs.)</i> | <i>Chairman</i>               | 425      | 8,174       | 3,000         | 8,000     | 1,300     |
|                                   | <i>Officer</i>                | 6,629    | 2,549       | 1,000         | 2,900     | 452       |
|                                   | <i>Director</i>               | 2,465    | 6,027       | 1,000         | 4,000     | 300       |
|                                   | <i>Officer &amp; Director</i> | 1,163    | 5,050       | 1,800         | 5,000     | 690       |
|                                   |                               | 10,682   |             |               |           |           |

Table 3 cont.

**Panel C.** This panel describes the distribution of the sample across time, broken down by type of transaction.

*Mean number of insider transactions per month by calendar year*

|      | <i>Insider sales</i> | <i>Insider purchases</i> | <i>Insider acquisitions<br/>by exercise of options</i> |
|------|----------------------|--------------------------|--|
| 1979 | 44.6                 | 17.7                     | 23.1   |
| 1980 | 56.5                 | 17.3                     | 27.7   |
| 1981 | 40.2                 | 16.5                     | 21.9   |
| 1982 | 64.3                 | 14.4                     | 20.0   |
| 1983 | 59.9                 | 14.8                     | 37.7   |
| 1984 | 46.9                 | 20.7                     | 26.3   |
| 1985 | 51.8                 | 15.6                     | 39.3   |
| 1986 | 58.9                 | 11.5                     | 56.0   |
| 1987 | 36.4                 | 16.0                     | 42.8   |
| 1988 | 53.0                 | 12.0                     | 44.0   |

*Mean number of insider transactions by calendar month*

|      | <i>Insider sales</i> | <i>Insider purchases</i> | <i>Insider acquisitions<br/>by exercise of options</i> |
|------|----------------------|--------------------------|--|
| Jan. | 52.1                 | 18.9                     | 34.8   |
| Feb. | 70.6                 | 17.0                     | 56.8   |
| Mar. | 49.6                 | 16.4                     | 32.4   |
| Apr. | 50.9                 | 14.6                     | 28.0   |
| May  | 44.4                 | 13.0                     | 31.1   |
| Jun. | 49.8                 | 14.3                     | 17.2   |
| Jul. | 43.0                 | 16.2                     | 33.6   |
| Aug. | 67.9                 | 12.2                     | 41.8   |
| Sep. | 38.2                 | 13.2                     | 18.3   |
| Oct. | 41.4                 | 23.8                     | 23.0   |
| Nov. | 48.2                 | 14.7                     | 30.6   |
| Dec. | 59.2                 | 16.3                     | 33.3   |

Table 3 cont.

|     | <i>Mean number of insider transactions by month relative to fiscal year end</i> |                          |  |
|-----|---|--------------------------|--|
|     | <i>Insider sales</i>  | <i>Insider purchases</i> | <i>Insider acquisitions<br/>by exercise of options</i> |
| -11 | 43.6  | 18.8                     | 30.2   |
| -10 | 70.4  | 20.1                     | 61.6   |
| -9  | 44.2  | 16.4                     | 30.7   |
| -8  | 45.9  | 15.2                     | 27.8   |
| -7  | 50.9  | 13.3                     | 29.9   |
| -6  | 44.7  | 12.2                     | 17.7   |
| -5  | 44.8  | 15.9                     | 32.6   |
| -4  | 69.2  | 12.0                     | 45.4   |
| -3  | 40.2  | 11.9                     | 18.9   |
| -2  | 43.4  | 20.8                     | 18.7   |
| -1  | 51.7  | 16.2                     | 30.3   |
| 0   | 52.0  | 16.8                     | 29.3   |

**Table 4**  
**Changes in insider trading activity around 949 management earnings forecast dates**

Three time-series regressions are estimated for every management earnings forecast date. The dependent variables are the daily number of insider sales, purchases, and acquisitions by exercise of options. This table provides the cross-sectional averages of coefficients on all independent variables. The model takes the following form:

$$\begin{aligned} \text{InsSales}_t, \text{InsPurchases}_t, \text{ or } \text{InsOptions}_t = & \alpha + \beta_1 D\_PreMF2_t + \beta_2 D\_PreMF1_t \\ & + \beta_3 D\_PostMF1_t + \beta_4 D\_PostMF2_t \\ & + \gamma_1 D\_PreEA_t + \gamma_2 D\_PostEA_t + \varepsilon_t \end{aligned}$$

where day  $t$  is between event days -50 and +49 relative to the management earnings forecast date

| Independent variable | Predicted sign | Average coefficient <sup>1</sup><br>(n=921) <sup>2</sup> |                   |   |
|----------------------|----------------|--|-------------------|---|
|                      |                | Insider sales  | Insider purchases | Insider acquisitions by exercise of options |
| Intercept            | +              | 0.0245 (0.01)  | 0.0050 (0.01)     | 0.0177 (0.01)                               |
| D_PreMF2             | -              | -0.0025 (0.09)   | 0.0024 (0.99)     | -0.0069 (0.01)                              |
| D_PreMF1             | -              | -0.0062 (0.01)   | 0.0021 (0.96)     | -0.0048 (0.01)                              |
| D_PostMF1            | +              | 0.0059 (0.01)  | 0.0039 (0.01)     | 0.0002 (0.47)                               |
| D_PostMF2            | +              | 0.0039 (0.05)  | 0.0032 (0.01)     | 0.0039 (0.04)                               |
| D_PreEA              | -              | -0.0091 (0.01)   | 0.0006 (0.76)     | 0.0001 (0.52)                               |
| D_PostEA             | +              | 0.0067 (0.01)  | 0.0027 (0.01)     | 0.0099 (0.01)                               |

**Variable descriptions:**

*InsSales*, *InsPurchases*, and *InsOptions* are the daily number of insider sales, purchases, and acquisitions by exercise of options.

*D\_PreMF2* takes on the value of one (zero otherwise) if day  $t$  is between event days -20 and -11 relative to the management earnings forecast date; *D\_PreMF1* takes on the value of one (zero otherwise) if day  $t$  is between event days -10 and -1 relative to the management earnings forecast date.

*D\_PostMF1* takes on the value of one (zero otherwise) if day *t* is between event days +1 and +10 relative to the management earnings forecast date; *D\_PostMF2* takes on the value of one (zero otherwise) if day *t* is between event days +11 and +20 relative to the management earnings forecast date.

*D\_PreEA* takes on the value of one (zero otherwise) if day *t* is within a twenty-trading-day window before a quarterly earnings announcement; *D\_PostEA* takes on the value of one (zero otherwise) if day *t* is within a twenty-trading-day window after a quarterly earnings announcement.

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<sup>1</sup>The numbers in parentheses represent one-sided *p*-values from *t*-statistics under the null hypothesis that the cross-sectional averages of coefficients equal zero.

<sup>2</sup>The sample size is reduced by 18 observations because of missing data on the location of quarterly earnings announcements in the event period. In addition, the most extreme one percent of the observations for each coefficient are deleted before calculating its cross-sectional average in order to reduce the effect of outliers on the findings.



**Table 5**  
**Pearson correlation coefficients among characteristics of 10,102 insider transactions**  
**of 85 sample firms between 7/1/79 and 12/31/87<sup>1</sup>**

|                                 | <i>SizeRel</i> <sup>2</sup> | <i>D_EA</i> <sup>3</sup>   | <i>D_Reg</i> <sup>4</sup>   | <i>D_Chairman</i> <sup>5</sup> | <i>D_Officer</i>            | <i>D_Officer &amp; Director</i> |
|---------------------------------|-----------------------------|----------------------------|-----------------------------|--------------------------------|-----------------------------|---------------------------------|
| <i>SizeRel</i>                  | 1.000                       |                            |                             |                                |                             |                                 |
| <i>D_EA</i>                     | 0.030<br>(0.01)             | 1.000                      |                             |                                |                             |                                 |
| <i>D_Reg</i>                    | -0.270<br><del>(0.01)</del> | 0.033<br><del>(0.01)</del> | 1.000                       |                                |                             |                                 |
| <i>D_Chairman</i>               | 0.120<br><del>(0.01)</del>  | 0.016<br>(0.10)            | -0.109<br><del>(0.01)</del> | 1.000                          |                             |                                 |
| <i>D_Officer</i>                | -0.110<br><del>(0.01)</del> | 0.009<br>(0.34)            | 0.090<br><del>(0.01)</del>  | -0.263<br><del>(0.01)</del>    | 1.000                       |                                 |
| <i>D_Officer &amp; Director</i> | 0.118<br><del>(0.01)</del>  | -0.002<br>(0.85)           | -0.043<br><del>(0.01)</del> | -0.072<br><del>(0.01)</del>    | -0.443<br><del>(0.01)</del> | 1.000                           |

**Table 5 cont.**

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<sup>1</sup>The numbers in parentheses represent two-sided *p*-values.

<sup>2</sup>*SizeRel* is computed as the natural log of transaction size in terms of number of shares divided by the number of shares outstanding in millions.

<sup>3</sup>*D\_EA* takes on the value of one (zero otherwise) if the insider transaction occurs within a twenty-trading-day window after a quarterly earnings announcement.

<sup>4</sup>*D\_Reg* takes on the value of one (zero otherwise) if the insider transaction occurs after the passage of the 1984 Insider Trading Sanctions Act.

<sup>5</sup>*D\_Chairman*, *D\_Officer*, and *D\_Officer&Director* take on the value of one (zero otherwise) if the insider transaction is made by a person with this corporate affiliation.

**Table 6**  
**Logit estimation of characteristics of insider transactions that occur**  
**closely after management earnings forecasts**

This table uses 10,102 insider transactions of 85 sample firms between 7/1/79 and 12/31/87, broken down by type of transaction. Panel A includes the entire sample. Panel B eliminates 2,991 insider transactions that occur in February and August. The model takes the following form:

$$D\_MF_i = \alpha + \beta_1 SizeRel_i + \beta_2 D\_EA_i + \beta_3 D\_Reg_i + \beta_4 D\_Chairman_i \\ + \beta_5 D\_Officer_i + \beta_6 D\_Officer \& Director_i + \varepsilon_i$$

**Panel A.**

| Independent variable            | Predicted sign | Coefficient <sup>1</sup>   |                                |   |
|---------------------------------|----------------|----------------------------|--------------------------------|---|
|                                 |                | Insider sales<br>(n=5,247) | Insider purchases<br>(n=1,622) | Insider acquisitions<br>by exercise of options<br>(n=3,233) |
| <i>Intercept</i>                |                | 1.425 (0.01)               | 1.360 (0.01)                   | 1.166 (0.01)  |
| <i>SizeRel</i>                  | +              | 0.156 (0.03)               | 0.497 (0.01)                   | 0.313 (0.01)  |
| <i>D_EA</i>                     | -              | -0.507 (0.01)              | -0.221 (0.08)                  | -0.813 (0.01)   |
| <i>D_Reg</i>                    | +              | -0.032 (0.63)              | 0.235 (0.07)                   | 0.234 (0.01)  |
| <i>D_Chairman</i>               | +              | 0.319 (0.07)               | 0.600 (0.12)                   | -0.416 (0.88)   |
| <i>D_Officer</i>                | +              | 0.417 (0.01)               | 0.495 (0.01)                   | -0.110 (0.70)   |
| <i>D_Officer &amp; Director</i> | +              | 0.322 (0.02)               | 1.137 (0.01)                   | -0.304 (0.88)   |

Table 6 cont.

| Panel B.                        |                |                            |                                |   |
|---------------------------------|----------------|----------------------------|--------------------------------|---|
| Independent variable            | Predicted sign | Coefficient                |                                |   |
|                                 |                | Insider sales<br>(n=4,080) | Insider purchases<br>(n=1,317) | Insider acquisitions<br>by exercise of options<br>(n=2,406) |
| <i>Intercept</i>                |                | 1.315 (0.01)               | 1.490 (0.01)                   | 1.023 (0.01)  |
| <i>SizeRel</i>                  | +              | 0.236 (0.01)               | 0.445 (0.01)                   | 0.279 (0.01)  |
| <i>D_EA</i>                     | -              | -0.471 (0.01)              | -0.026 (0.44)                  | -0.891 (0.01)   |
| <i>D_Reg</i>                    | +              | -0.890 (0.80)              | 0.172 (0.16)                   | 0.135 (0.13)  |
| <i>D_Chairman</i>               | +              | 0.424 (0.04)               | 0.699 (0.09)                   | -0.297 (0.78)   |
| <i>D_Officer</i>                | +              | 0.442 (0.01)               | 0.468 (0.01)                   | -0.029 (0.55)   |
| <i>D_Officer &amp; Director</i> | +              | 0.362 (0.02)               | 1.501 (0.01)                   | -0.228 (0.79)   |

## Variable descriptions:

*D\_MF* takes on the value of one (zero otherwise) if the insider transaction occurs within a twenty-trading-day window after a management earnings forecast.

*SizeRel* is computed as the natural log of transaction size in terms of number of shares divided by the number of shares outstanding in millions.

*D\_EA* takes on the value of one (zero otherwise) if the insider transaction occurs within a twenty-trading-day window after a quarterly earnings announcement.

*D\_Reg* takes on the value of one (zero otherwise) if the insider transaction occurs after the passage of the 1984 Insider Trading Sanctions Act.

*D\_Chairman*, *D\_Officer*, and *D\_Officer&Director* take on the value of one (zero otherwise) if the insider transaction is made by a person with this corporate affiliation.

<sup>1</sup>For independent variables with a predicted sign, the numbers in parentheses represent one-sided *p*-values. Otherwise, they are two-sided *p*-values.

**Table 7**  
**Ex-post errors for sub-set of 1,211 management earnings forecasts with**  
**predictions in either point or range formats categorized by**  
**post-forecast net insider trading activity<sup>1</sup>**

| <i>Variable</i>                       |                              | <i>N</i> | <i>Mean</i> | <i>Median</i> | <i>Q3</i> | <i>Q1</i> |
|---------------------------------------|------------------------------|----------|-------------|---------------|-----------|-----------|
| <i>Ex-post error<sup>2</sup> (\$)</i> | <i>Net insider sales</i>     | 117      | 0.29        | -0.01         | 0.07      | -0.05     |
|                                       | <i>Neutral</i>               | 224      | 0.11        | 0.00          | 0.12      | -0.09     |
|                                       | <i>Net insider purchases</i> | 50       | 0.12        | 0.00          | 0.09      | -0.04     |
|                                       |                              | 391      |             |               |           |           |

<sup>1</sup>The post-forecast period consists of event days +1 through +20 relative to the management earnings forecast date. Net insider trading activity is defined as the number of insider sales transactions minus the number of insider purchase transactions.

<sup>2</sup>*Ex-post error* is the predicted earnings amount from the management earnings forecast minus the realized earnings amount for the reporting period to which the prediction applies. The predicted earnings amount is set equal to the midpoint of upper and lower bounds for predictions in the range format.

**Table 8**  
**Differences in insider trading activity after quarterly earnings announcements**  
**based upon timing with respect to management earnings forecasts**

Three time-series regressions are estimated for every sample firm. The dependent variables are the daily number of insider sales, purchases, and acquisitions by exercise of options. This table provides the cross-sectional averages of coefficients on all independent variables. The model takes the following form:

$$InsSales_t, InsPurchases_t, \text{ or } InsOptions_t = \alpha + \gamma_1 D\_PreEA_t + \gamma_2 D\_PostEA_t + \delta D\_Change_t + \varepsilon_t$$

where day  $t$  is between 7/1/79 and 12/31/87

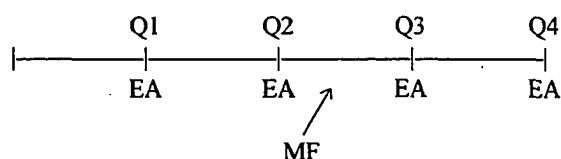
| Independent variable | Predicted sign | Average coefficient <sup>1</sup><br>(n=85) |                   |   |
|----------------------|----------------|--|-------------------|---|
|                      |                | Insider sales                              | Insider purchases | Insider acquisitions by exercise of options |
| Intercept            | +              | 0.0274 (0.01)                              | 0.0078 (0.01)     | 0.0149 (0.01)                               |
| <i>D_PreEA</i>       | -              | -0.0079 (0.01)                             | 0.0002 (0.59)     | -0.0027 (0.02)                              |
| <i>D_PostEA</i>      | +              | 0.0093 (0.01)                              | 0.0030 (0.01)     | 0.0108 (0.01)                               |
| <i>D_Change</i>      | +              | 0.0076 (0.04)                              | 0.0025 (0.16)     | 0.0065 (0.05)                               |

Variable descriptions:

*InsSales*, *InsPurchases*, and *InsOptions* are the daily number of insider sales, purchases, and acquisitions by exercise of options.

*D\_PreEA* takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window before a quarterly earnings announcement; *D\_PostEA* takes on the value of one (zero otherwise) if day  $t$  is within a twenty-trading-day window after a quarterly earnings announcement.

*D\_Change* takes on the value of one (zero otherwise) if 1.) day  $t$  is within a twenty-trading-day window after a quarterly earnings announcement that is on either side of a management earnings forecast (depicted in the diagram below by Q2 and Q3), 2.) the management earnings forecast in question is not within twenty trading days of a quarterly earnings announcement, and 3.) there is at least one insider transaction of the same type as the dependent variable within a twenty-trading-day window after the management earnings forecast in question.



**Table 8 cont.**

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<sup>1</sup>The numbers in parentheses represent one-sided  $p$ -values from  $t$ -statistics under the null hypothesis that the cross-sectional averages of coefficients equal zero.