Strategic Trading and Trade Reporting by Corporate Insiders*

André Betzer, Jasmin Gider, Daniel Metzger and Erik Theissen**

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Abstract: In the pre-Sarbanes-Oxley era corporate insiders were required to report trades in shares of their firm until the 10th of the month following the trade. This gave them considerable flexibility to time their trades and reports strategically, e.g., by executing a sequence of trades and reporting them jointly after the last trade. We document that the reporting requirements were apparently not enforced. More than 13% of the trades were reported too late. We further find clear evidence of strategic trading. Only 32.1% of the insider trades in our sample are classified as non-strategic. The probability of strategic trading depends on firm and trade characteristics and on the role of the insider in the firm. We perform an event study where the event date is the date of the report. We find that the CARs do not decrease in the length of the reporting delay. This implies that share prices are distorted by delayed reporting. Thus, delayed reporting is detrimental to market efficiency. Finally, we find that the event study CARs are larger after the report of strategic insider trades as compared to otherwise similar non-strategic insider trades. Our results have important policy implications. In particular, they lend strong support to the more stringent trade reporting requirements established by the Sarbanes Oxley Act.

Keywords: Insider trading, directors' dealings, corporate governance, market efficiency

JEL classification: G14, G30, G32

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** André Betzer, University of Mannheim, Email: betzer@uni-mannheim.de; Jasmin Gider, Bonn Graduate School of Economics, Email: jgider@uni-bonn.de; Daniel Metzger, London School of Economics, Email: D.Metzger@lse.ac.uk; Erik Theissen, University of Mannheim, Centre for Financial Research (Cologne) and Center for Financial Studies (Frankfurt), Email: theissen@uni-mannheim.de.

1 Introduction

Corporate insiders arguably know more about the prospects of their firm than other market participants. This hypothesis is supported by a host of papers documenting that insider trades, and purchases in particular, convey information to the market (e.g., Seyhun 1986 and Chang and Suk 1998 for the US, Fidrmuc et al. 2006 and Friederich et al. 2002 for the UK). The US and many other countries have adopted regulations that require corporate insiders to report their trades.[1] The model of Huddart et al. (2001) provides a theoretical justification for these regulations. They show that information is reflected more rapidly in prices when insiders have to disclose their trades. Several empirical papers (e.g.,Chang and Suk 1998, Betzer and Theissen 2009a) have shown that there is a share prices reaction both on the trading date and on the reporting date. Thus, without the report the market is unable to infer the full information content of the trade. This implies that market prices are distorted in the period between the trading date and the reporting date. Delayed reporting, then, may be detrimental to market efficiency.

In the pre-SOX era Section 16 of the Exchange Act required corporate insiders in the US to report their trade until the 10th of the month following the trade. Thus, the maximum time allowed between the trade and the report was 40 days, giving corporate insiders considerable flexibility to time their trades and reports. This flexibility may be used strategically. An insider wishing to trade a large quantity may split up her order into several smaller chunks. Splitting up a large order reduces the price impact of the order and thus results in reduced execution costs (e.g., Kyle 1985,

[1] Some countries (e.g., the UK) even prohibit trading by corporate insiders in certain circumstances. Similarly, many listed firms in the US have adopted policies restricting trading by insiders (Bettis et al. 2000).

Chordia and Subrahmanyam 2004). By delaying the reporting of the trades of the series until after the last transaction the insider can avoid the price impact caused by the reports.

Note that the incentive to strategically time the trades and the reports does not depend on the assumption that the insider trades on private information. The only assumption necessary for our argument is that other market participants believe that the insider possesses private information with positive probability. The stylized fact that prices react to the publication of insider trades supports this assumption.

In this paper we ask four related questions. First, how long have reporting delays been in the pre-SOX era? Second, did insiders use the flexibility they enjoy in choosing the timing of their trades and their reports strategically? If so, is strategic behavior systematically related to characteristics of the insider or the firm? Third, what are the implications on market efficiency of delayed reporting? Fourth, how does the market react to strategic timing of trades and reports?

The first question is important because, as argued above, delayed reporting may be detrimental to market efficiency. The relevance of the second question derives from the observation that strategic timing benefits the insider at the expense of other market participants. If each trade was reported immediately, the second and subsequent trades of a series of insider trades would be executed at prices less favorable to the insider but more favorable to the counter parties. The answer to the third question allows us to assess the importance of the issues addressed in this paper. The fourth question is important because the answer enables us to draw inferences on the trading motives of insiders engaging in strategic timing. On the reporting dates market participants learn whether there has been strategic delaying of reports. If market participants believe that insiders

possessing private information are more likely to time their trades and reports, we should observe a larger price reaction as compared to an otherwise similar but non-strategic trade.

Our results can be summarized as follows. First, reporting delays have been substantial. The mean reporting delay was 35.0 days, the median was 24 days. 13.2% of all trades in our sample were reported later than on the 10th of the month following the trade. The very large number of violations of the trade reporting requirement implies that the requirement was apparently not enforced. In fact, we were unable to detect even a single case in which an insider was fined because of late reporting. We further find that there is clear evidence of strategic trading. Only 32.1% of the trades in our sample were non-strategic trades (i.e., these trades were reported before the same insider traded again, and they were not preceded by a trade by the same insider that had not yet been reported).

Logit models reveal that the occurrence of both late filings and strategic trades is systematically related to characteristics of the firm. In particular, the results are consistent with the notion that insiders who are more closely monitored (and who therefore may be facing higher litigation risk) are less likely to file their trades late. The probability of observing a strategic trade is larger in firms followed by fewer analysts and is larger for larger trades. This is intuitive because the potential benefit of splitting up a trade is increasing in the size of the trade.

Consistent with previous findings, our event study results show that the share price reacts to the reporting of insider trades. The cumulative abnormal returns over ten and twenty-day windows are larger after purchases than after sales. In cross-sectional regressions we find that the magnitude of the price reaction does not decrease in the reporting delay. Thus our results support the notion that market prices are distorted in the period between the trade and the report. This sup-

ports our conjecture that delayed reporting is detrimental to market efficiency. Finally, the event study cumulative abnormal returns are larger after the report of strategic insider trades as compared to otherwise similar non-strategic trades. Thus, market participants apparently believe that insiders acting strategically are more likely to possess private information.

Our results clearly support the more stringent trade reporting requirements established by the Sarbanes Oxley Act. They also suggest that countries which currently allow longer reporting delays should consider to revise and / or enforce their regulations. Recent evidence reported in Fidrmuc et al. (2009) suggests that some countries do not yet mandate and enforce timely trade reporting. Using recent samples (ending May 2007) the authors find median reporting delays of 5 days for Italy, 7 days for Belgium and 14 days for France.

Our paper adds to the literature on trading by corporate insiders. It is related to four recent papers by Cheng et al. (2007), Betzer and Theissen (2009b), Brochet (2009) and Lebedeva et al. (2009). Cheng et al. (2007) exploit the feature that corporate insiders in the US could, in certain circumstances, delay the reporting of non-open market trades until the end of the fiscal year of the firm (SEC form 5 trades). They find that insider sales by top executives in S&P 500 firms disclosed in such a delayed manner predict negative future returns and lower operating profitability relative to analyst forecasts. Insider purchases, on the other hand, are hardly predictive of future returns. Cheng et al. conclude (p. 1861) that "managers in large firms may have used late-disclosure Form 5 sales for information-based trading...". Betzer and Theissen (2009b) use data from Germany to show that substantial reporting delays are common, that the delays are systematically related to characteristics of the firm, and that abnormal returns after the reporting date of an insider trade are independent of the reporting delay. The latter finding implies that prices are distorted in the

period between the trading and the reporting date. Brochet (2009) focuses on differences in the information content of insider trades pre- and post-SOX. He regresses event study CARs on a set of explanatory variables including the reporting delay and finds that the price reaction after purchases is weaker when the trade is reported with a longer lag, but that the reverse is true for insider sales. Lebedeva et al. (2009) find strong evidence that corporate insiders in the US break up larger trades into a series of smaller trades. They refer to this as stealth trading. They also find that liquidity-based explanations for this behavior have more explanatory power than information-based explanations.

Our paper differs from Cheng et al. (2007) in that we do not analyze the relatively small sample of non-open market trades that were eligible for late reporting but the much larger sample of all insider trades that had to be filed on SEC form 4. [2] It differs from Betzer and Theissen (2009b) in that our sample is much larger than theirs (314,696 observations as compared to 1,977) and the regulatory regime in the US is distinctly different from that in Germany. Brochet (2009) does not analyze strategic trading and trade reporting. He interprets the delay variable as a measure for the information leakage between the trading and the reporting date. Further, his sample is much smaller than ours because his sample starts in 1997 and only includes trades by the CEO, the CFO, the COO, the board chair and the president. Lebedeva et al. (2009) focus on uncovering the motives for stealth trading. They do not analyze late filings, and they do not analyze how the reporting delay affects the CAR on the reporting date.

The remainder of the paper is organized as follows. In section 2 we describe our data set and present descriptive statistics. In section 3 we present evidence on delayed trade reporting. In section

4 we analyze whether there are incidences of strategic trading and trade reporting. We also analyze whether trades classified as "strategic" are systematically different from non-strategic trades. Section 5 uses event study methodology to compare the market response to strategic and non-strategic trades. Section 6 concludes.

2 Data

Our analysis requires data on insider trades, data on firm characteristics and stock price data. The data selection process follows Lakonishok and Lee (2001) and Marin and Olivier (2008). We merge data from four different sources, the TFN Insider Filing Data Files, the CRSP database, the COMPUSTAT database and the I/B/E/S database. The initial sample consists of insider trades reported on SEC form 4 in companies listed in on the NYSE, AMEX or Nasdaq during the 1992 – 2001 period. It covers the last 10 calendar years before the implementation of the Sarbanes Oxley Act (SOX). The SOX enacted a regime change as it required insiders to report their trades within two working days after their trade.

We start our sample construction with the TFN database. We include all open market or private purchases (transaction code P) and all open market or private sales (transaction code S) of non-derivative securities whose records have not been amended (amendment indicator “blank”) between the 1st of January 1992 and the 31st of December 2001. Out of these transactions, we only retained those filings whose data is verified by Thomson with a high level of confidence (cleanse indicator R and H). The TFN Insider Filing Data Files contain information about the following:

- The company name and CUSIP .

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[2] The number of Form 5 sales (purchases) for the S&P 500 stocks during 1998-2001 amounted to 438 (419). The

- The transaction date and the reporting date (SEC Receipt Date).
- The transaction code (purchase or sale), the number of shares exchanged in the transaction and the transaction price.
- The insider's position within the firm. We decided to classify all insiders into four groups:
  - The CEO (possibly also chairman of the board)
  - Chairman (only if not simultaneously CEO)
  - Executive directors excluding the CEO
  - Other non-executive officers, affiliates, beneficial owners, or other persons required to report their trades.

We exclude all filings which have no entry in the fields "transaction price", "number of shares", "reporting date to SEC", "position of insider" and "sector". This procedure leaves us with 741,653 records. We also exclude insider transactions whenever the reported transactions price is not inside a 20% interval around the CRSP closing price on the insider trading day. We further exclude trades when the number of shares traded exceeds 20% of the total shares outstanding. We do not attempt to single out Rule 10b5-1 trades because the number of these pre-planned trades was very low in the pre-SOX era. Brochet (2009), using a sample covering 1997-2002, reports that Rule 10b5-1 trades only account for 0.55% of the trades in his sample.

We complement the data on insider transactions with supplementary data from different sources. We obtain financial data from the COMPUSTAT database. All data items are taken from the financial statement of the respective firm at the end of the fiscal year preceding the reporting of the insider trade. We measure book leverage (variable *bookleverage*) as the ratio of long term debt

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corresponding figures for Form 4 trades are 10,166 and 7,217, respectively (Cheng et al. 2007, Table 1D).

(data item 9) plus debt in current liabilities (item 34) divided by long term debt plus debt in current liabilities plus stockholders' equity (item 216). Firm size (*size*) is defined as the natural logarithm of the market value of equity. Tobin's Q (*Q*) is calculated as the ratio of the market value of assets to book value of total assets (item 6). Following Malmendier and Tate (2007), we define the market value of assets as total assets plus market equity (item 25 times item 199) minus book equity. We obtain book equity by adding stockholder's equity and balance sheet deferred taxes and investment tax credit (item 35) where available minus preferred stock liquidating value (item 10) and minus post retirement assets (item 336) where available.[3]

Furthermore, we obtain data on analysts' forecasts and the announcement dates of quarterly or annual earnings reports from the I/B/E/S and COMPUSTAT databases. We define our variable *numest* as the total number of analysts covering the respective company in the last available yearly earnings-forecast before the transaction date of the respective insider trade. We further obtained the dates of all quarterly earnings announcements.

For an observation to be included in our analysis we require all necessary data items in CRSP, COMPUSTAT and I/B/E/S to be available. This reduces the sample to 314,696 observations.

In our empirical analysis we use additional variables that are defined as follows: *d_tcode_p* (*d_tcode_s*) is a dummy variable that takes on the value one if the net transaction volume (to be defined below) of the respective insider trade is positive (negative). The *days_delay* variable is the difference in days between the reporting date and the transaction date. We calculate the vari-

[3] If stockholder's equity is not available as data item 216 we calculate stockholder's equity alternatively as common equity (item 60) plus preferred stock par value (item 130) or total assets minus total liabilities (item 181). If preferred stock liquidating value is not available as data item 10 we calculate preferred stock liquidating value alternatively as redemption value (item 56) or par value (item 130). Return on Equity (variable *ROE*) is net income (item 172) divided by book equity.

able *transvolmarketcap* as the ratio of the number of shares exchanged in the transaction times the transaction price divided by the market value of equity. We define *insidertradesameday* as the total number of insiders that traded shares in the same company on the same day.

In our analysis we use three different data sets, a "transaction sample", a “report sample” and an "event study sample". For the transaction sample we aggregate all transactions by the same insider that are a) executed on the same day and b) jointly reported on the same day. We present the aggregated transaction as one trade with the net amount traded. The (net) transaction volume is positive (negative) if the sum of all individual trades by this particular insider on the trading day is positive (negative). After these calculations, we classify the aggregated transactions as purchase or sale. Our final transaction sample contains 98,933 purchases and 215,763 sales (314,696 observations in total). The report sample aggregates all transactions by the same insider which are jointly reported on the same day. If one report consists of both purchases and sales, we proceed as above to define net purchases (sales). The final sample contains 57,940 purchases and 115,744 sales (173,684 in total).

The announcement date in our event study analysis is the day on which an insider trade was filed with the SEC. Therefore, we aggregate all insider trades in the shares of a given firm that were reported on the same day, irrespective of whether the trades were reported by the same insider or by different insiders. Again, the aggregated transactions are treated as one trade and the net trade direction and net volume are as defined above. The final dataset for the event study consists of 34,614 purchases and 59,730 sales (99,967 in total).

Table 1 presents descriptive statistics for the firms in our sample. The average firm size, as measured by the market value of equity, is 4544.39 Mio. $. The firm size distribution is heavily

skewed. We therefore use the log of firm size in our empirical analysis. The average Tobin's Q of the sample firms is 3.52, the average return on equity amounts to 8.90% and the mean book leverage to 41.43%.

The mean trade size, expressed as a percentage of the market value of equity, is 0.121%. In 62.10% of the cases only one insider trades on a given day. In the remaining cases more than one insider traded on the same day. The average number of insiders trading on a given day is 2.04, the maximum number is 32. The average insider trade is executed 57.0 calendar days before the firm reports the next annual or quarterly earnings report

Figure 1 shows the distribution of the trading dates. Although there appears to be a weak u-shaped pattern the general impression from the figure is that trades are more or less evenly distributed over the month. The distribution of the reporting dates, shown in Figure 2, is dramatically different. The daily frequencies start at a low level (only 0.81% of the trades are reported on the first day of the month) and then increase strongly until the tenth of the month. On this day alone, almost 32% of the trades are reported. When we weight the trades by their volume this number further increases to 42.7%. After the tenth the frequencies decline sharply. In the second half of the month there is no single day on which more than 0.75% of the trades are reported.

There are two, not mutually exclusive (and observationally equivalent), explanations for the strong pattern we document. First, many corporate insiders may routinely report the trades made during the previous month on the tenth. This practice may hamper market efficiency and may be to the disadvantage of other traders (although not intentionally). Whenever share prices react to the reporting of an insider trade, reporting delays imply distorted prices in the period between the trading and the filing date. If an insider executes several trades on different days but reports them

jointly, the later trades are executed at prices which are more favourable than they would have been in case each trade had been reported immediately. This is beneficial for the insider but obviously to the disadvantage of the counter parties to her trades. Second, some insiders may *intentionally* delay the reporting of their trades in order to avoid the price impact triggered by the report. By only considering the trading and filing dates these two cases cannot be distinguished. However, the share price reaction on the filing date can be expected to reflect the market's beliefs about the motives of the insiders. Therefore, analyzing the price reaction will allow us to draw inferences about the economic significance of strategic trade reporting.

3 Reporting Delays

In this section we present evidence on the magnitude of the reporting delays and on the determinants of late filings. The frequency distributions of trading and reporting dates shown in Figure 1 and Figure 2 demonstrate that trades are approximately evenly distributed over the month whereas reports cluster around the tenth. If indeed insider trades were equally distributed over the days of the month and if each trade was reported on the 10th of the month after the trade (i.e., on the last permissible day), we would expect an average reporting delay of approximately 25 days. Table 2 shows the actual reporting delays. The median delay (24 days for purchases and sales) roughly corresponds to the benchmark value derived above. The mean delay is much longer at 35.0 days.[4] Purchases are reported with longer delays than sales (40.4 days as compared to 32.5 days). This may be indicative of strategic delaying because previous papers (e.g., Seyhun 1986 and Brochet 2009 for the US, Fidrmuc et al. 2006 for the UK) have documented that insider pur-

chases are more informative as evidenced by larger abnormal returns. This, in turn, implies that insiders who purchase shares are more likely to possess private information and therefore have greater incentives to conceal their trading activity.

The discrepancy between the mean and the median reporting delay implies that the distribution of reporting delays is heavily skewed. The magnitude of the average delay further implies that a significant fraction of the trades, and the purchases in particular, are reported too late (i.e., later than on the 10th of the month following the trade). In fact, Table 2 reveals that 13.2% of the trades in our sample were reported too late.[5] We use the term "late filings" for these cases. Late filings are more common for purchases than for sales (17.5% as compared to 11.3%).

The high percentage of late filings is stunning. It implies that, in the pre-SOX era, the reporting requirements were not enforced. In fact we were unable to identify even a single case in which a corporate insider was fined for late filing. This is all the more surprising because violations of the reporting requirement are easily detectable - the TFN data base contains the trading and the reporting date together with a person id which easily allows for the identification of the insider.

The percentage of late filings is too large to be explained by accidental omissions. There rather appears to be a substantial fraction of insiders who either do not care about the reporting requirements or who deliberately (and maybe strategically) decide to file their reports late. To shed light on the issue we estimate a logit model where the dependent variable is 0 if a trade was reported in time (i.e., until the 10th of the month following the trade) and 1 if the trade was reported late. The

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[4] This figure is larger than the corresponding figure given in Table 1 of Brochet (2009). Brochet uses a shorter sample period (starting in 1997) and confines his analysis to trades initiated by the CEO, the CFO, the COO, board chairs, and presidents.

[5] These figures take into account the fact that, when the tenth of a month is a Saturday or a Sunday, the trade only needs to be reported on the 12th or the 11th, respectively.

independent variables include firm and trade characteristics. We include Tobin's Q as a proxy for the valuation of the firm, the return on equity as a measure of operating profitability, and book leverage. We use the number of analysts following as a proxy for investor attention[6].

Trade characteristics include the trade volume relative to the market capitalization of the firm and the number of different insiders trading on the same day. We further include a dummy variable which identifies trades made within a 30-day interval after an earnings announcement.[7] We add this variable because many firms restrict trading by insiders to a trading window that is open for a specified period after the quarterly earnings announcement, with a common window being a month after the earnings announcement (Bettis et al. 2000, Roulston 2003). We define three dummy variables that describe the position of the insider in the firm. The first dummy is set to one when the CEO is among the traders trading on a given day. The second dummy identifies trades by the chairman of the board (unless the chairman is simultaneously the CEO) and the third one identifies trades by other executive directors of the firm. Trades by outside directors, beneficial owners and others thus constitute the base group.

We estimate a pooled model that includes both purchases and sales and two separate models including only purchases and sales, respectively. The pooled model includes a dummy variable that captures differences in the probability of late reporting between purchases and sales. All models

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[6] We do not include firm size to avoid multicollinearity (the correlation between firm size and the number of analysts following is 0.79). We obtain very similar results when we replace the number of analysts by firm size.

[7] In some cases data on earnings announcement dates is missing. We deal with this by excluding all observations where the time between the insider trade and the date of the publication of the next quarterly earnings announcement is more than 91 days. We obtain similar results when we include all observations. In the latter case we misclassify those insider trades that were executed within a 30-day window after the publication date of an earnings announcement which is not included in our data set.

include sector dummies (where we adopt the classification used in the TFN insider filings) and year dummies.

The results are reported in Table 3. The probability of late filings is generally higher for purchases than for sales. This result is consistent with the earlier finding that average reporting delays are longer for purchases than for sales. Trades by insiders in firms followed by more analysts are less likely to be filed late. This is intuitive given that these firms tend to be larger and are under closer scrutiny by analysts and investors in general. We further find that trades by insiders in more highly leveraged firms are more likely to be reported late. Purchases by insiders in firms with higher Q and in firms with lower return on equity are more likely to be files late. No such relation is found for insider sales.

Considering the trade specific variables next we find that trades executed during the 30 days after an earnings announcement are significantly less likely to be reported late. There are two, not mutually exclusive, explanations for this finding. First, insiders are less likely to possess relevant private information shortly after an earnings announcement and therefore do not have a strong incentive to strategically delay the reporting of their trades. Second, many firms have adopted policies which allow insider trades only in a window which is open for a specified period after the quarterly earnings announcement (Bettis et al. 2000). Insiders in these firms are more likely to trade shortly after an earnings announcement and, at the same time, are more likely to be scrutinized and may therefore tend to file their reports in time. The other two trade-specific variables, trade size and the number of insiders trading on a given day, yield inconsistent result. The odds for late filing increase in the trading volume for purchases but decrease in the trading volume for

sales. Both coefficients are significant only at the 10% level. Purchases on days on which several insiders trade are more likely to be filed late whereas the reverse is true for sales.

With respect to the position of the insider within the firm we find that CEOs, the chairmen of the board and executive directors are significantly less likely to file late than other corporate insiders (as, e.g., non-executive directors and beneficial owners). This is again consistent with the notion that insiders who are under closer scrutiny are more reluctant to file their reports late.

In summary, the results are consistent with the notion that the occurrence of late filings is not random but is systematically related to the characteristics of the firm, the trade, and the trader. In particular, it appears that insiders who are more closely monitored (and who therefore may be facing higher litigation risk) are less likely to file their trades late.

4 Incidences of Strategic Trading and Strategic Trade Reporting

So far we have documented that considerable reporting delays exist and that in more than 13% of the cases the reporting requirement is violated. Delayed reporting per se may be detrimental to market efficiency but it does not benefit the insider. Thus, an insider who only wants to execute a single trade has no incentive (beyond convenience) to delay the filing. This is different, however, when the insider intends to trade more than once. In this case, delaying the reporting of the earlier trades avoids the price reaction the report would trigger. Thus, later trades are executed at prices which are more favorable than those that would have prevailed if each trade had been reported immediately. Note that this is true irrespective of whether the insider trades on private information or not. It is sufficient that other market participants believe that the insider is informed with positive probability.

In this section we search for evidence on strategic trade reporting. We classify a trade as non-strategic if it is a) not preceded by another trade that has not been reported until the trading date and b) is not followed by another trade before it is reported.[8] All other trades are classified as strategic because they are part of a series of trades in which some trades were executed while other trades were not yet reported. We note that this classification is conservative. The group of strategic trades does not only contain trades that were deliberately reported late. As noted previously, it is likely that some corporate insiders routinely report their trades on the tenth of the following month. If an insider adhering to this reporting practice trades several times in a month our classification scheme will treat these trades as strategic. There are two reasons why we stick to our classification. First, we cannot distinguish *why* we observe a specific pattern of trades and reports. Second, even if an insider does not intentionally delay the reporting of the earlier trades of a series, the delayed report still puts the counter parties to the later trades at a disadvantage - they would have traded at more favorable prices if the insider had reported all trades immediately.

The results are reported in Table 4. Only 32.1% of the trades in our sample are categorized as non-strategic. This percentage is larger for purchases than for sales (38.0% versus 29.4%). This is surprising at first sight since purchases are known to have larger price impacts (which should increase the incentive to strategically delay the reporting of a trade). Further, we have documented that the average reporting delays are larger for purchases. A potential explanation for the result is the difference in trade size. The figures in Table 4 reveal that insider sales are, on average, much larger than insider purchases. The large size of the sell orders provides an incentive to

[8] Lebedeva et al. (2009) use a related definition to identify stealth trading. They define a sequence of trades as stealth if the trades in the sequence are in the same direction and occur before or on the same day where the first trade of the series is reported.

split the trade up and report the individual trade only after all trades of the sequence were executed.

67.9% of the trades in our sample are classified as strategic. Each strategic trade is part of a sequence of trades. The end of a sequence is reached when there are no more unreported trades. The figures in Table 4 reveal that 15.0% of the trades are classified as the first trade of a sequence while 52.9% are classified as second or subsequent trades of a sequence. These numbers imply that a sequence, on average, consists of 4.5 trades. This number is higher for purchases than for sales (4.9 as compared to 4.4).

The figures in Table 4 document that strategic trade reporting is widely practiced. We therefore now analyze whether strategic trades are systematically different from non-strategic trades. To this end we estimate logit models where the dependent variable indicates whether a trade is classified as strategic or as non-strategic. The independent variables are the trade, firm and trader characteristics introduced in the previous section. We add a dummy variable that identifies trades which were filed late. We estimate a pooled model as well as separate models for purchases and sales.

The results are reported in Table 5. Purchases are less likely to be classified as strategic than sales. This is consistent with the descriptive results presented above and may be related to the fact that insider purchases on average are much smaller than insider sales. The likelihood of observing strategic trades is higher in firms followed by fewer analysts. This is intuitive because insiders in these firms are less closely monitored. We further find an increased likelihood for strategic trades in firms with lower return on equity. The coefficients of the other two firm characteristics, Tobin's Q and leverage, have inconsistent signs.

Turning to the trade specific variables next we find that larger trades are more likely to be classified as strategic trades. This is again very intuitive because the benefit of splitting up an order is more pronounced for larger orders. We also find that trades executed on days on which more than one insider traded and trades that are filed late are more likely to be classified as strategic. The dummy variable identifying trades executed in the 30 days after the publication of an earnings announcement has inconsistent signs and is significant only for insider purchases. Interestingly, the CEO and the chairman of the board are more likely to engage in strategic trading whereas other executive directors are less likely to engage in strategic trading than the members of the base group (non-executive directors, beneficial owners and others).

The results lend support to the hypothesis that insiders strategically time their trades and make strategic use of the pre-SOX reporting rules. In the next section we turn to the question of whether the market reaction to the reporting of insider trades takes that into account.

5 The Market Response to Strategic Trades

In this section we analyze the share price reaction after the reporting of insider trades using standard event study methodology. This analysis serves a dual purpose. First, we want to test our conjecture that delayed reporting is detrimental to market efficiency. To this end we analyze whether the reporting day cumulative abnormal returns decrease in the length of the reporting delay. Such a relation would provide evidence that the market is able to learn the information contained in the insider trade from other sources and thus does not have to rely on the report. If, on the other hand, we find no such relation this would provide evidence that market prices are indeed distorted in the period between the trading and the reporting date. This, in turn, would imply that delayed re-

porting hampers market efficiency. Second, we wish to analyze whether the cumulative abnormal returns are larger after the reporting of strategic trades. The result will allow us to draw conclusions about the market's belief about the insiders' trading motives. If the market reaction after strategic trades was stronger than after otherwise similar non-strategic trades this would provide evidence that the market attributes a greater information content to these trades.

As already noted above we use standard event study methodology. The event date is defined to be the day on which an insider trade is filed with the SEC. The analysis is based on the "event study sample" introduced in section 2. This sample is obtained by aggregating all insider trades in shares of the same firm that were reported on the same day. We have to aggregate reports filed by different insiders because otherwise we would double-count observations. We estimate the market model over a 255 day estimation window ending 46 days[9] prior to the announcement date. We use the CRSP value-weighted index as our market proxy. T-statistics are based on the standardized cross-sectional test proposed by Boehmer et al. (1991).

The event study results are reported in Table 6. We report cumulative abnormal returns (CARs) over three event windows; namely, (-1; 1), (0; 10) and (0; 20) and we report separate results for insider purchases and insider sales. Consistent with previous research we find that CARs over a short event window are small. The cumulative abnormal return over the three-day window (-1; 1) amounts to 0.36% for purchases and -0.34% for sales. The CARs increase significantly when the lengths of the event window is increased. The cumulated abnormal returns over the event window (0; 10) are 2.74% for purchases and -0.87% for sales. The corresponding values for the 20-day

[9] We choose a longer delay between the end of the estimation window and the event window because we did not want the estimation window to be contaminated by the execution of the insider trade. 46 days is slightly more than the maximum delay for reporting admissible in the pre-SOX era.

event window (0; 20) are 2.97% and -2.72%, respectively. These results confirm previous findings that the share price reaction is stronger after insider purchases than after insider sales.

We next compare the CARs after strategic and non-strategic trades. In order to do so we need a definition of a strategic trade that is observable by market participants. We therefore define a trade to be strategic if it is reported on the same day as at least one other trade by the same insider that was executed on a different date.[10]

The share price reaction after strategic trades is stronger than the reaction after non-strategic trades irrespective of whether we consider purchases or sales, and irrespective of the length of the event window. Consider the CARs over the 20 day window (0; 20) as an example. It is 2.74% after strategic purchases but only 1.71% after non-strategic purchases. The corresponding figures for strategic and non-strategic sales are -2.72% and -1.59%, respectively. The difference between the price reaction after strategic and non-strategic trades is statistically significant in five out of six cases, the exception being the (-1; 1) event window for purchases.

Table 6 also reports the results of some further cross-tabulations. We first consider the timing of trades relative to earnings announcement dates. In a first step we look at trades that were executed before but reported after an earnings announcement. To this end we define a dummy variable "timed" that is set to one if all trades of a sequence were executed before and reported after the

[10] This definition is slightly different from the one we used in the previous section. There, we defined a trade as strategic when it was either followed by another trade by the same insider before being reported, or when it was preceded by another trade by the same insider that had not yet been reported. To see the difference between the two definitions consider an insider who trades on Monday and on Tuesday and reports the first trade on Thursday and the second trade on Friday. According to the definition used in the previous section these are strategic trades. This classification is justified because the second trade is executed before the first trade was reported. Thus, the second trade would have occurred at a different price had the first trade been reported immediately. However, on the date of the first report (Thursday) market participants cannot infer that the trade was strategic because they are

earnings announcement date. We find that the timed trades convey significantly less information to the market. Considering again the (0; 20) event window as an example we find a CAR of 3.22% for non-timed purchases and a CAR of only 1.87% for timed purchases. The corresponding figures for sales are -2.19% and -1.21%, respectively. These results are consistent with the notion that earnings announcements reduce the informational asymmetry between insiders and the market.

We next consider trades executed within a 30 day window after an earnings announcement. We do this because many firms restrict trading by insiders to a trading window that is open for a specified period after an earnings announcement, with a common window being a month after the earnings announcement (Bettis et al. 2000, Roulston 2003). We define the dummy variable "clear" which is set to one if all trades of a series were executed within 30 days after an earnings announcement date. We find that purchases made during the 30-day window after the announcement result in significantly smaller share price reactions. This is again consistent with the notion that earnings announcements reduce informational asymmetries. For insider sales there are no significant differences between trades made shortly after an earnings announcement and other trades.

Next we compare trades that were reported in time to trades that were filed late. We define a dummy variable "late filing" which is set to one if at least one trade of a sequence was filed late. The results are inconsistent. Over longer event windows (10 or 20 days) the trades that were reported in time trigger stronger share price reactions (3.02% versus 2.69% for purchases and -2.06% versus -2.04% for sales). The difference is significant only for insider purchases, however.

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not aware of the second trade. In order to make sure that we only use information that was available to market

Trades that are filed late are, by definition, reported with longer delays. Thus, finding that insider purchases which are filed late trigger smaller share price reactions is consistent with the notion that the market learns the information contained in the report from other sources. In order to shed more light on this important issue we next sort the insider trades in our sample with respect to their weighted average reporting delay into ten groups (delay 0-5 days, 5-10 days and so on; the trades in the tenth group have a weighted average delay of more than 45 days). We find that the CARs after insider purchases tend to be negatively related to the reporting delay. No such tendency can be detected for insider sales.[11]

The results in Table 6 suggest that non-strategic trades, trades that are executed before but reported after an earnings announcement, and trades executed within a 30-day window after an earnings announcement trigger smaller share price reactions. They also suggest that the CAR is decreasing in the length of the reporting delay for insider purchases but not for sales. However, up to now we did not control for the other characteristics of the firm and the trade. Including such controls is important because we have shown previously that trades that are filed late are systematically different from trades that are filed in time. Similarly we have shown that strategic trades are different from non-strategic trades. In addition, a strategic trade is, by definition, reported on the same day as at least one other trade. Therefore, the total reported volume may be larger. It may be the larger volume rather than the strategic nature of the trade per se that causes the larger CARs.

We therefore estimate cross-sectional regressions that control for the total reported volume and other potentially relevant variables. The dependent variable is the cumulative abnormal return.

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participants we use the modified definition of strategic trades for the event study analysis.

We report results for the CARs measured over the event window (0; 20). Using the shorter event window (0; 10) yields very similar results.

The independent variables include measures of firm characteristics (Tobin's Q, the return on equity, book leverage, and the number of analysts following[12]) and trade characteristics (the transaction volume relative to the market capitalization of the firm and aggregated over all trades that were reported jointly, the number of different insiders trading on the same day, and the weighted average reporting delay[13]). We further include dummy variable identifying strategic trades, "timed" trades (as defined above) and trades that were executed within a 30-day window after an earnings announcement. Three further dummy variables control for the position of the insider in the firm (CEO, chairman of the board, other executive directors[14]). Finally we include year and industry dummies.

We estimate separate models for purchases and sales. Note that we expect different signs for the coefficients in the two regressions because the CARs after purchases are predominatly positive while those after sales are predominantly negative. The results are shown in Table 7.

The CARs after insider purchases are smaller for firms with higher values of Tobin's Q. The other firm characteristics are insignificant. The share price reaction after a purchase does not depend on the transaction volume. It is larger when more than one insider reported trades on the

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[11] Brochet (2009) reports a similar result.

[12] We do not include firm size to avoid multicollinearity (the correlation between firm size and the number of analysts following is 0.80. Replacing the number of analysts following by firm size yields very similar results.

[13] One potential problem with the delay variable lies in the fact that there are obvious outliers in the sample, as is evidenced by a maximum reporting delay in excess of 10 years. We deal with this issue by estimating three alternative versions of the model. We use a) a delay variable that is winsorized at 42 (the maximum delay allowed in the pre-SOX era), b) the log of 1 plus the delay and c) a dummy variable that identifies trades that were filed late. These alternative specifications yield similar results. We therefore only report results for the base model.

same day. Consistent with our earlier results we find that purchases executed shortly after an earnings announcements and purchases that were executed before but reported after an earnings announcement trigger significantly smaller share price reactions than other trades. These results are consistent with the notion that earnings announcements convey information to the market and reduce informational asymmetries. Purchases by the CEO, by the chairman of the board and by other executive directors result in higher CARs than purchases by members of the base group (non-executive directors, affiliates, beneficial owners and others). This result in general and the relative size of the coefficients in particular are consistent with the informational hierarchy hypothesis which posits that trades by insiders with more privileged access to information convey more information to the market.

The most important results are those with respect to the "strategic trading" dummy and the reporting delay. Strategic trades trigger a significantly larger share price reaction even after controlling for other relevant variables. Thus, market participants apparently believe that strategic purchases are more likely to be motivated by private information than otherwise similar non-strategic trades. The CARs after insider purchases are unrelated to the reporting delay. Thus, once we control for trade and firm characteristics the negative relation reported in Table 6 disappears. This result supports our conjecture that delayed reporting is detrimental to market efficiency.

The results for insider sales are largely in line with those for purchases. We observe differences with respect to Tobin's Q, the number of insiders following, the transaction volume and the "clear" dummy. Share price reactions after insider sales are more pronounced in firms with higher Q but significantly less pronounced in firms followed by more analysts. Larger trades trigger

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[14] If several insiders report their trades on the same day, we choose the highest position, i.e., we set the dummy to 1

stronger price reactions. CARs for sales executed shortly after the publication of an earnings announcement are not different from those for trades executed at other times. All other coefficients are consistent with those obtained in the model for purchases. Share price reactions after insider sales are stronger when more than one insider reported a trade and when the CEO, the chairman of the board or another executive director was among the traders. They are weaker for trades that were executed before but reported after an earnings announcement. Most importantly, the CARs after insider sales are independent of the reporting delays and are higher after a strategic trade.

In summary, thus, our regression results confirm our conjecture that delayed trade reporting is detrimental to market efficiency. They further indicate that market participants deem strategic trades to be motivated by private information.

6 Summary and Conclusion

In the pre-SOX era corporate insiders in the US were required to report their trades until the 10th of the month following the trade. Thus, the maximum time allowed between the trade and the report was 40 days, giving corporate insiders considerable flexibility to time their trades and reports. This flexibility may be used strategically. An insider wishing to trade a large quantity may split up her order into several smaller chunks. Splitting up a large order reduces the price impact of the order and thus results in reduced execution costs. By delaying the reporting of the trades of the series until after the last transaction the insider can avoid the price impact caused by the reports.

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if at least one of them is the CEO, the chairman of the board, or an executive director, respectively.

In this paper we ask four related questions. First, how long have reporting delays been in the pre-SOX era? Second, did insiders use the flexibility they enjoy in choosing the timing of their trades and their reports strategically? If so, is strategic behavior systematically related to characteristics of the insider or the firm? Third, what are the implications on market efficiency of delayed reporting? Fourth, how does the market react to strategic timing of trades and reports?

Our results demonstrate that substantial reporting delays existed. The mean reporting delay was 35 days. More than 13% of the trades in our sample were filed late (i.e., later than on the tenth of the month following the trade). The very large number of violations of the trade reporting requirement implies that the requirement was not enforced in the pre-SOX era. Corporate insiders apparently used their discretion to time their reports. More than two thirds of the trades in our sample are part of a sequence of trades in which some trades were executed while earlier trades were not yet reported. Strategic trade reporting benefits the insider but is disadvantageous to the counter parties to her trades. If each trade was reported immediately, the second and subsequent trades of a series of insider trades would be executed at prices less favorable to the insider but more favorable to the counter parties.

We find that both the occurrence of late filings and the occurrence of strategic trades are systematically related to characteristics of the firm, the trade, and the trader. In particular, the results are consistent with the notion that insiders who are more closely monitored (and who therefore may be facing higher litigation risk) are less likely to file their trades late. The probability of observing a strategic trade is larger in firms followed by fewer analysts and is larger for larger trades.

Our event study results reveal that the share price reacts to the reporting of insider trades. In cross-sectional regressions we find that the magnitude of the price reaction does not decrease in the reporting delay. Thus, our results support the notion that market prices are distorted in the period between the trade and the report. Consequently, delayed reporting of insider trades is detrimental to market efficiency. Finally, the event study cumulative abnormal returns are larger after the report of strategic insider trades as compared to otherwise similar non-strategic trades. Thus, market participants apparently believe that insiders acting strategically are more likely to possess private information.

Our results support the more stringent trade reporting requirements established by the Sarbanes Oxley Act. They also suggest that strict enforcement of existing regulation is beneficial. Furthermore, our results allow the conclusion that countries which currently allow for long reporting delays (or do not at all require corporate insiders to report trades in shares of their firm) should consider to revise their regulations.

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Table 1: Descriptive Statistics

The table reports the summary statistics for the transaction sample. Tobin's Q is calculated as the ratio of the market value of assets to book value of total assets. RoE is net income divided by book equity. We measure Leverage as the ratio of long term debt plus debt in current liabilities divided by long term debt plus debt in current liabilities plus stockholders' equity. We define our variable numest as the total number of analysts covering the respective company in the month before the reporting date of the respective insider trade. We calculate the variable TradeVolume as the ratio of the number of shares exchanged in the transaction times the transaction price divided by the market equity of the company whose stocks were bought or sold in the insider trade. We define NumInsider as the total number of insiders that traded their shares in the same company on the same day. Days to next report denotes the number of days from the transaction to the next quarterly earnings announcement. The delay indicates the lag in days between trading and reporting of the transaction.

Variables	Observations	Mean	St. Dev.	Min	Median	Max
Market value of equity ($ mill.)	314,696	4544.39	21599.05	0.83	463.779	508329.5
Tobin's Q	314,696	3.518829	6.176608	.2060	1.809387	105.0904
RoE	314,696	.0890093	.2683587	-.80291	.0970181	9.886905
Leverage	314,696	.3142774	.5807833	0	.2453287	69.17618
TradeVolume	314,696	.00121	.0059537	0	.000221	.5794915
NumInsider	314,696	2.037859	2.120972	0	1	32
Days to next report	314,696	57.00452	23.36936	0	62	91
Number of analysts	314,696	7.568774	7.434395	1	5	51
Delay (days)	314,696	34.99665	95.14544	0	24	3815

Table 2: Distribution of Delays

The table reports summary statistics for the distribution of the delays. The basic population consists of all insider transactions.

	All	Purchase	Sales
Observations	314,696	98,933	215,763
Mean	35.00	40.42	32.51
St. Dev.	95.15	114.54	84.66
0.25 Quantile	15	14	16
Median	24	24	24
0.75 Quantile	33	34	33
Percentage of Late Filings	13.21%	17.48%	11.25%

Table 3: Determinants of Late Filing

The table reports the results of a logit regression of the dichotomized variable illegal on the explanatory variables listed in column 1. A trade is classified as illegal when it was reported later than the 10th of the month following the trade. If the 10th of month falls on a weekend, the trade is classified as illegal when it was reported later than the following Monday. All other trades are legal. D_Purchase is a dummy variable that takes on the value one if the (net) transaction volume of the respective insider trade is positive and zero otherwise. Tobin's Q is calculated as the ratio of the market value of assets to book value of total assets. ROE is net income divided by book equity. We measure Leverage as the ratio of long term debt plus debt in current liabilities divided by long term debt plus debt in current liabilities plus stockholders' equity. We define our variable numest as the total number of analysts covering the respective company in the month before the reporting date of the respective insider trade. We calculate the variable TradeVolume as the ratio of the number of shares exchanged in the transaction times the transaction price divided by the market equity of the company whose stocks were bought or sold in the insider trade. We define NumInsider as the total number of insiders that traded their shares in the same company on the same day. D_clear is a dummy variable that takes on the value one if the trade occurs more than 60 days to the next earnings announcement. We decided to classify all insiders into four groups (four variables): D_CEO if the trader is CEO, D_Chairman if the trader is chairman but not CEO. D_Executive if the trader is not CEO but officer. The reference group is D_other which includes all other insider groups. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	All		Purchases		Sales	
Target Characteristics	Coef.	z-statistic	Coef.	z-statistic	Coef.	z-statistic
D_Purchase	0.28	23.12***				
Tobin's Q	0.00	0.68	0.01	2.82***	-0.00	-0.75
RoE	-0.00	-2.08**	-0.00	-2.76***	-0.00	-0.48
Leverage	0.06	3.75***	0.02	2.83***	0.11	8.48***
Numest	-0.04	-40.32***	-0.04	-21.34***	-0.04	-33.97***
TradeVolume	-1.08	-1.07	3.77	1.72*	-1.88	-1.67*
NumInsider	0.00	0.56	0.01	2.52**	-0.01	-1.93*
D_clear	-0.25	-23.07***	-0.26	-14.78***	-0.23	-16.91***
D_CEO	-0.54	-28.10***	-0.63	-20.99***	-0.46	-18.62***
D_Chairman	-0.45	-14.36***	-0.50	-8.70***	-0.41	-11.20***
D_Executive	-0.46	-37.46***	-0.44	-21.05***	-0.45	-29.94***
Constant	-1.34	-10.75***	-0.70	-1.83*	-2.10	-12.07
Year Dummies		included		included		included
Ind. Dummies		included		included		included
Observations		314,696		98,933		215,763
Mc Fadden R^2		0.0393		0.0345		0.0318

Table 4: Descriptives Strategic

This table shows the descriptive statistics for the transactions in our sample sorted by the classification of the trade into the categories non-strategic and strategic. A trade is classified as strategic when it is followed by at least one additional trade by the same insider before it is reported or if it follows a trade by the same insider that has not yet been reported. A trade is classified as non-strategic when it is not strategic and when it is not involved in a strategic trade. The category strategic is split into first of series and serial trades. A trade is classified as first of series if the trade is the first trade in a series of trades where at least one trade is followed by at least one additional trade by the same insider before it is reported. A trade is classified as a serial trade if it follows a trade by the same insider that has not yet been reported. Percentage indicates the fraction with respect to all transactions, all purchases or all sales respectively. The average volume denotes the average volume of the trade, i.e., the number of shares bought or sold multiplied by the transaction price.

	ALL		Purchases		Sales	
Observations	314,696		140,734		215,763	
	Percentage	Average volume $	Percentage	Average volume $	Percentage	Average volume $
Non-strategic	32.12%	1,291,563	37.97%	197,628	29.44%	1,938,516
Strategic	67.88%	1,015,069	62.03%	284,504	70.56%	1,309,553
First of series	14.98%	1,389,175	12.59%	213,350	16.08%	1,811,510
Serial trades	52.90%	909,106	49.44%	302,631	54.48%	1,161,429

Table 5: Determinants of Strategic Trades

The table reports the results of a logit regression of the dichotomized variable strategic on the explanatory variables listed in column 1. A trade is classified as strategic when it is followed by at least one additional trade by the same insider before it is reported. A trade is classified as non-strategic when it is not strategic and when it is not involved in a strategic trade. D_Purchase is a dummy variable that takes on the value one if the (net) transaction volume of the respective insider trade is positive and zero otherwise. Tobin's Q is calculated as the ratio of the market value of assets to book value of total assets. ROE is net income divided by book equity. We measure Leverage as the ratio of long term debt plus debt in current liabilities divided by long term debt plus debt in current liabilities plus stockholders' equity. We define our variable numest as the total number of analysts covering the respective company in the month before the reporting date of the respective insider trade. TradeVolume as the ratio of the number of shares exchanged in the transaction times the transaction price divided by the market equity of the company whose stocks were bought or sold in the insider trade. We define NumInsider as the total number of insiders that traded their shares in the same company on the same day. D_clear is a dummy variable that takes on the value one if the trade occurs more than 60 days to the next earnings announcement. D_illegal is a dummy variable that takes on the value one if the trade is reported later than the 10th of the month following the trade. If the 10th of month falls on a weekend, the trade is classified as illegal when it was reported later than the following Monday. We decided to classify all insiders into four groups (four variables): D_CEO if the trader is CEO, D_Chairman if the trader is chairman but not CEO. D_Executive if the trader is not CEO but officer. The reference group is D_other which includes all other insider groups. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	All		Purchases		Sales	
Target Characteristics	Coef.	z-statistic	Coef.	z-statistic	Coef.	z-statistic
D_Purchase	-0.47	-38.79***				
Tobin's Q	0.02	16.01***	-0.01	-1.84*	0.02	14.95***
RoE	-0.00	-4.01***	-0.00	-3.02***	-0.00	-2.55***
Leverage	0.01	0.85	0.05	3.65***	-0.04	-2.91***
Numest	-0.02	-27.25***	-0.02	-14.67***	-0.02	-23.56***
TradeVolume	27.14	14.11***	78.14	11.97***	17.89	10.47***
NumInsider	0.04	14.15***	0.01	1.84*	0.05	14.14***
D_clear	-0.01	-0.89	-0.05	-2.44**	0.01	0.92
D_illegal	0.43	36.61***	0.50	23.87***	0.37	25.72***
D_CEO	0.15	8.42***	0.08	2.81***	0.22	9.43***
D_Chairman	0.41	13.34***	0.30	5.29***	0.49	13.09***
D_Executive	-0.51	-43.53***	-0.64	-29.68***	-0.46	-31.50***
Constant	-0.16	-3.21***	-0.33	-3.50***	0.08	1.25
Year Dummies	included		included		included	
Ind. Dummies	included		included		included	
Observations	173,684		57,765		114,984	
Mc Fadden R^2	0.0579		0.0600		0.0550	

Table 6: Event Study Results

This table shows the cumulative abnormal returns (CARs) over various event windows and various subsamples. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	Purchases				Sales			
	#	-1, 1	0, 10	0, 20	#	-1, 1	0, 10	0, 20
all	34,64	0.36%***	1.99%***	2.97%***	65,31	-0,34%***	-0,87%***	-2,05%***
strategic	9,493	0.39%***	2.74%***	4.21%***	26,81	-0,42%***	-1,17%***	-2,72%***
non-strategic	25,15	0.35%***	1.71%***	2.50%***	38,50	-0,28%***	-0,65%***	-1,59%***
Diff. (t-stat.)		0.75	8.70***	10.41***		-2.14**	-4.40***	-7.03***
Timed	6,472	0.22%***	1.28%***	1.87%***	8,793	-0,25%***	-0,5%***	-1,21%***
Non-timed	28,17	0.39%***	2.16%***	3.22%***	56,52	-0,35%***	-0,92%***	-2,19%***
Diff. (t-stat.)		-2.82***	-7.63***	-8.45***		1.73*	3.70***	6.14***
Illegal	8,105	0.36%***	1.65%***	2.69%***	14,89	-0,38%***	-0,79%***	-2,04%***
Legal	25,43	0.34%***	2.06%***	3.02%***	47,81	-0,32%***	-0,88%***	-2,06%***
Diff. (t-stat.)		0.43	-3.50***	-3.50***		-0.91	0.72	0.14
Clear	14,00	0.28%***	1.76%***	2.66%***	27,47	-0,34%***	-0,81%***	-2,14%***
Non-clear	20,64	0.41%***	2.16%***	3.18%***	37,84	-0,33%***	-0,91%***	-1,99%***
Diff. (t-stat.)		-2.08***	-3.43***	-3.22***		-0.14	0.91	-0.91
Delay 0 - 5	1,273	1.31%***	3.81%***	4.52%***	847	0,09%**	-0,01%	-1,07%***
Delay 6 - 10	3,793	0.45%***	2.31%***	3.35%***	4,603	-0,35%***	-0,65%***	-1,71%***
Delay 11 - 15	5,714	0.33%***	2.07%***	2.93%***	9,980	-0,25%***	-0,86%***	-2,01%***
Delay 16 - 20	5,161	0.39%***	2.02%***	3.35%***	10,85	-0,32%***	-0,91%***	-2,11%***
Delay 21 - 25	5,497	0.35%***	2.23%***	3.36%***	12,65	-0,41%***	-0,81%***	-2,04%***
Delay 26 - 30	5,085	0.33%***	1.57%***	2.47%***	12,01	-0,37%***	-1,05%***	-2,32%***
Delay 31 - 35	3,943	0.2%***	1.95%***	3.12%***	9,014	-0,40%***	-0,99%***	-2,29%***
Delay 36 - 40	2,190	-0.00%	1.67%***	2.52%***	4,706	-0,32%	-0,8%***	-2,45%***
Delay 41 - 45	687	0.14%**	1.15%***	1.99%***	1,129	-0,24%	-0,69%***	-1,52%***
Delay > 45	3,130	0.46%***	1.49%***	2.40%***	4,797	-0,34%***	-0,71%***	-1,61%***

Table 7: Determinants of CARs (0,20)

The table reports the results of a regression of the reporting day CARs(0, 20) on the explanatory variables listed in column 1. Tobin's Q is calculated as the ratio of the market value of assets to book value of total assets. ROE is net income divided by book equity. We measure Leverage as the ratio of long term debt plus debt in current liabilities divided by long term debt plus debt in current liabilities plus stockholders' equity. We define our variable numest as the total number of analysts covering the respective company in the month before the reporting date of the respective insider trade. The variable Index is the Gompers et al. (2003) index which measures shareholder restrictions in the US. We calculate the variable TradeVolume as the ratio of the number of shares exchanged in the transaction times the transaction price divided by the market equity of the company whose stocks were bought or sold in the insider trade. We define NumInsider as the total number of insiders that traded their shares in the same company on the same day. D_clear is a dummy variable that takes on the value one if the trade occurs more than 60 days to the next earnings announcement. D_Timing is a dummy variable that takes on the value one if the trade is executed before the firm's earnings announcement and reported afterwards. D_Strategic is a dummy variable that takes on the value one if a trade is followed by at least one additional trade by the same insider before all trades are reported jointly. D_Timing * D_Stra. is an interaction term of the variables D_Timing and D_Strategic. Raw delay is the weighted delay of all insider trades of a firm reported to the SEC on a particular day. We decided to classify all insiders into four groups (four variables): D_CEO if the trader is CEO, D_Chairman if the trader is chairman but not CEO. D_Executive if the trader is not CEO but officer. The reference group is D_other which includes all other insider groups. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	Purchases		Sales	
Determinants	Coef.	t-statistic	Coef.	t-statistic
Tobin's Q	-0.61	-8.69***	-0.37	-12.22***
RoE	0.01	0.36	0.00	0.10
Leverage	0.09	0.50	0.03	0.30
Numest	-0.02	-1.48	0.03	3.66***
TradeVolume	-11.33	-1.08	-14.88	-2.63***
NumInsider	0.18	2.59**	-0.31	-4.80***
D_clear	-0.94	-4.42***	-0.16	-1.06
D_timing	-1.29	-4.65***	0.64	2.72***
D_Strategic	1.35	4.77***	-0.49	-2.96***
D_Timing * D_Stra.	-0.00	-1.15	0.13	0.44
Raw Delay	0.00	-0.22	0.00	1.08
D_CEO	2.21	7.43***	-0.50	-2.04**
D_Chairman	1.28	2.40**	-0.17	-0.52
D_Executive	1.01	4.56***	-0.36	-2.18**
Constant	-0.60	-0.31	-3.11	-1.64*
Year Dummies		included		included
Ind. Dummies		included		included
Observations		34,648		65,319
Adjusted R^2		0.0228		0.0164

Figure 1: Distribution of Trading Days over the Month

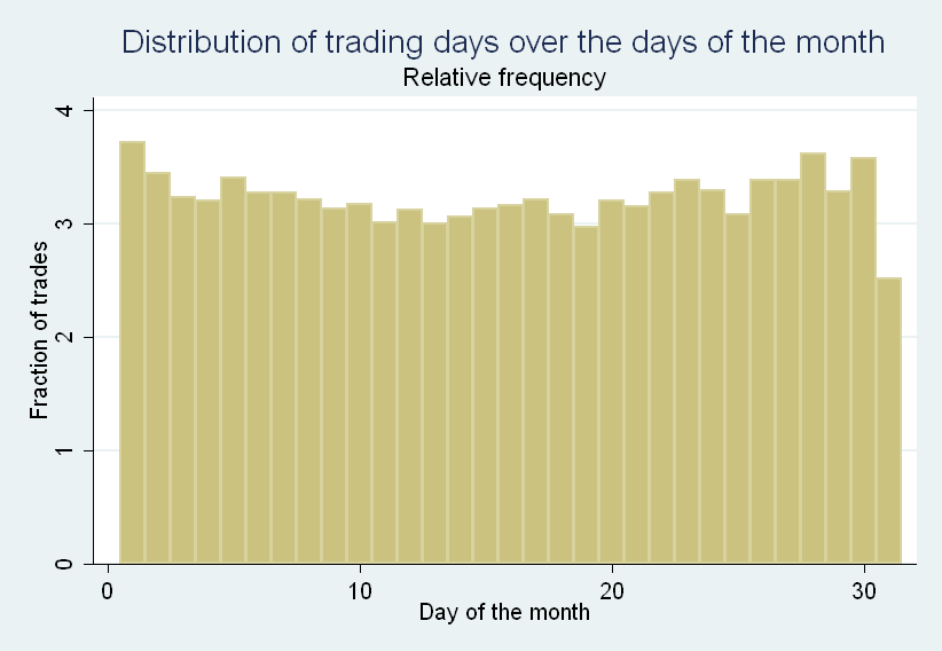

Figure 2: Distribution of Reporting Dates over the Month