Directors' Trades around Earnings Announcements on the London Stock Exchange

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Abstract

We examine the short-run profitability of strategies replicating trades of corporate insiders in the shares of their own company immediately after earnings announcements. We find that even after adjusting for "round-trip" (spread) transactions costs, sizeable net cumulative abnormal returns remain at least for buy trades, and these excess returns are larger the sooner after the announcement the trade occurs. This is consistent with the ability of corporate insiders to forecast the post-earnings drift, a sluggish price adjustment after the announcement that has been identified as one of the most robust stock market anomalies.

Keywords: corporate insiders, informed trading, post-earnings announcement drift, bid-ask spreads, dealership market.
JEL Classification: G14

I Introduction

Do directors hold information regarding their firm's prospects and future stock performance that is superior to that of outside investors? An examination of the profitability of insiders' trades has potential implications for both the strong and the semi-strong forms of stock market informational efficiency. Karpoff and Lee (1991) and Lee (1997) find that insiders are typically net sellers of company stock before seasoned equity issues, implying that insiders have and act on privileged information before announcing it through new issue announcements. Conyon and Murphy (2000) report on the growth in share based incentive plans as part of the compensation package given to UK executives.[1] An interesting question which follows from this trend, is the extent to which corporate insiders use their private information about a company's prospects to trade for their own account to their personal benefit.

Previous work on the trades of corporate insiders has been concerned with assessing the profitability of different types of insiders' trades and at various horizons.[2] This work generally reports evidence consistent with some ability by directors to time the market and predict future returns. In the current paper we focus on returns around trades executed immediately after the most important of regularly scheduled corporate events, the earnings announcement. Earnings announcements convey price-relevant information, and directors' trades have been found to have the same effect. It seems natural and particularly simple to combine these two events in a trading strategy. We relate this to the well known "post-earnings announcement drift", a sluggish price adjustment which has been consistently found to occur in days after earnings disclosures [Liu, Strong and Xu

(2000)]. Fama (1998) regards post-earnings drift as the most robust and difficult to explain stock market anomaly. In much the same way that Chan and Lakonishok (1996) attempt to disentangle momentum from post-announcement drift effects, we examine whether the patterns in abnormal returns after directors' trades are largely or essentially due to slow price adjustment around earnings announcements. Sivakumar and Waymire (1994) and more recently Hillier and Marshall (2002b) have examined the stock price reaction of directors' trades around earnings announcements.

Analysing directors' trades for a sample of UK companies we find that a significant proportion of trades by insiders are done immediately after earnings announcements. However, it is not a priori obvious whether these trades contain any information and predictive power over future returns: since it is illegal for directors in the UK to trade in the two months prior to an earnings announcement, this pattern in their transactions may be due to insiders having simply postponed liquidity trades. On the other hand, the surge in trading on the day of the earnings announcement and the following two days may suggest a desire to time the market using information less than instantaneously incorporated in stock prices. Conditioning on whether the directors' trade occurs immediately after an earnings announcement or not, we report that imitating at least directors' buy trades after an announcement produces large abnormal returns, and they become larger the more quickly one trades after the announcement. In the case of sells, although we do find that directors seem to sell when prices are high, there are no excess returns from imitating those trades.

Of course, markets are only efficient up to the amount of transactions costs incurred through the implementation of a trading strategy. To examine the implications of directors' trading for semi-strong form efficiency, we compute the net profitability of these trading strategies using data on daily bid and ask prices. For an outside investor to earn abnormal returns following a stock purchase by a director, the outsider would buy the stock at the ask price and sell it at the bid at the end of the holding period (and conversely for a director sale). Even after adjusting for such microstructure transaction costs, we find that potential short-term abnormal returns to outsiders are still for buy signals occurring immediately after earnings announcements.

The regulation of directors' trades

In the UK, the 1985 *Companies' Act* specifies that directors are prohibited from dealing in the securities of their own companies for a period of two months prior to the announcement of year-end or half-year results, and at other times prior to the announcement of price-sensitive information. Under these disclosure requirements, directors must inform their company "as soon as possible after the transaction and no later than the fifth business day" of any transaction carried out for their personal account. In turn, a listed company must inform the Stock Exchange of the transaction "without delay and no later than the end of the business day following receipt of the information by the company" [London Stock Exchange (1998) p.8]. The Stock Exchange disseminates this information immediately to data vendors as well as via its own "Regulatory News Service". In practice, publications of directors' trades to the market in the UK is timely (in most cases within a few hours) because in many companies directors

need clearance from the Board before they are allowed to trade. In comparison, US regulators have taken a different approach, as there is no period formally defined by market authorities during which insiders are prevented from trading.[3] The Securities Exchange Act of 1934 requires insiders to refrain from trading on "material" undisclosed information, and to fill in statements of their holdings in the first ten days of the month following the month in which the trade occurred. Profits made on short-term "swings" in prices (formally, within 6 months) must be surrendered to the company. There is recent evidence suggesting that these arrangements successfully removed the incentives for trying to profit from short-term price "swings".[4]

To illustrate the importance of directors' trading around earnings announcements in the UK, in Figure 1 we plot the daily number of trades (both buys and sells) by directors around earnings announcements for our dataset. There are two earnings announcements (interim and final) per year and per company. There are about 250 trading days in every year, and this graph thus covers about half a year (125 days) with day 0 being an interim or final earnings announcement. Clearly the number of trades drops dramatically in the 40 trading days (two calendar months) before the earnings announcement, illustrating that the legal requirements are broadly obeyed.[5] Following the earnings announcement there is a surge in the number of directors' trades. It is particularly pronounced on the day of the announcement itself and on the following two days (days 0 to 2), either indicating that directors are trying to take advantage of a less than instantaneous price adjustment, or that liquidity trades have been postponed because of the legal requirements. It takes about 30 trading days for this unusual activity to settle back to normal. We examined patterns

around final and interim announcements, as well as for buy and sell trades separately, and they were not noticeably different

Kabir and Vermaelen (1996) examine the effect of the introduction of a regulation forbidding corporate insiders to trade two months before an annual earnings announcement on the Amsterdam Stock Exchange. They do not use actual data on corporate insiders' trades but they report evidence of reduced market-wide trading volumes and somewhat slower speed of price adjustment after the new regulation came into effect. This indicates that the trading activity of insiders before that time contributed to a greater informational efficiency - and that insiders did hold superior information. In a similar vein for the US market, Garfinkel (1997) examines the effectiveness of the "Insider Trading and Securities Fraud Enforcement" Act (1988) aimed at preventing information-based trading by insiders in the period around an earnings announcement. Garfinkel (1997) finds that the effect of this legislation was for insiders to tend to transfer execution of their transactions until after the earnings announcements in order to avoid attracting suspicion. He also reports that earnings announcements appeared more informative after the passage of the Insider Trading Act implying, like Kabir and Vermaelen (1996), that insider trading did cause pre-announcements price adjustments by incorporating privately-held information into prices before the 1988 Act.

Data and sample selection

The data on the trades of directors for the period 1986-1990 were obtained on microfiches from the London Stock Exchange. For 1991-1994, the data were provided to

us by Directus Ltd, a subsidiary of Barra which re-sells these data along with investment advice. For all companies listed, the dataset gives details of the date of the trade, the quantity and direction of the shares traded. In most cases it also gives the transaction price. A contribution of this study is to adjust estimates of the profitability of mimicking strategies for microstructure-induced transactions costs. The selection of stocks was therefore governed by the availability of daily bid and ask prices, provided by Datastream for deciles 1 to 4 of the constituents of the FT-All Share index. We obtained closing quoted bid and ask prices (closing inside quotes) at the end of each day from February 1986 to end-November 1994 for 196 companies. We chose not to focus on the most liquid stocks (FTSE-100 companies) because previous work by GMT (1997) showed higher gross abnormal returns in less-liquid securities. Our sample is comparatively homogeneous in terms of firm size. To compute daily returns on each stock, semi-annual dividend payments were obtained and added back into prices on the ex-dividend dates to calculate daily returns. This yields observations for 2,091 daily returns for each company. We also computed daily returns on the FT-SE Mid 250 index, which we use as a benchmark in the abnormal returns computations.

We collected earnings announcement data over the period 1986-94 from Extel's Sequencer package 1992-94, and from Extel cards in the earlier part of the sample, This resulted in eight final earnings announcements per company, (1,505 final earnings announcements) and a similar number of interim announcements. Over these eight years and 196 companies, we observe a total of 4,399 directors' trades (2,558 buy and 1,841 sell transactions), which represent the raw signal in our empirical work.[6] Some

descriptive statistics on individual (gross) signals are given in Panel A of Table 1 over the whole sample, the average buy transaction was worth about GBP 66,000, dwarfed by the average sell of about GBP 343,000. The median buy transaction was GBP 6,650, and the median sell was GBP 32,600. The distributions of both types of trades are skewed to the right, with some very large transactions in both cases: the largest transaction on the buy side was almost GBP 23 million (in 1988), while the largest sell was a staggering GBP 154 million (in 1991). Sell transactions are slightly more infrequent, but much larger. Transactions are distributed fairly evenly over the eight-year period, though there appears to be slightly fewer in the last three years of the sample. The basic signal triggering an event of a director's trade that we use in this study is the *net* quantity of shares traded on an event day, since on occasions, more than one director traded on the same day (occasionally in opposite directions). Panel B of Table 1 reports descriptive statistics on the distribution of the net buy and sell trades. There were 3,409 event-days in total, 1,887 on which directors were net purchasers, and 1,522 when directors were net sellers. Directors as a whole were clearly net sellers of their companies' shares over the sample period.

Methodology

We examine short-term movements in stock returns around the event date to investigate the ability of directors to engage in "market-timing", using a standard event-study methodology [Brown and Warner (1985)]. The daily abnormal stock market return on stock i on day τ is defined as the difference between the actual and expected return:

$$AR_{i,\tau} = R_{i,\tau} - \alpha_i - \beta_i Rm_\tau \qquad (1)$$

We use the returns on the FTSE-250 index as the benchmark Rm_t, and the parameters α_i and β_i were estimated in a pre-event period. Abnormal returns are averaged across events for every day in the event window, and average excess returns are cumulated to yield the familiar cumulative average abnormal return measure centered around the event date $CAR(\tau_1, \tau_2)$. The use of daily data makes the joint hypothesis or "bad-model" problem much less a concern since daily expected returns are close to zero. The only caveat in the interpretation of the results is that we are not claiming that the event is directly causing any observed pattern in returns, since the directors' trading process is endogenous with respect to the return series (like all market timing). Here, the event is triggered by a realised or expected change in the market value of the security. In turn, mimicking by outsiders after the event may have the potential to move the market in the short-run, but only information will cause a permanent price change.

We report the significance of the abnormal returns and CARs using standard t-statistics following Brown and Warner (1985). A potential problem for significance testing is a cross-sectional clustering of events causing standard errors not to be properly estimated. To the extent that there tends to be clustering in earnings announcement dates across companies, it is clear from figure 1 that there might be clustering of directors' trades immediately after earnings announcement dates, so that event clustering is potentially an acute problem when we focus on directors' trades around earnings announcements. Corrado (1989) suggests a non-parametric (rank) testing procedure that does not rely on normality assumptions. This statistic has been shown in simulations to be much more robust to problems of event clustering and thin trading. Campbell and Wasley (1993)

consider the test to be well-adapted to NASDQ market data, and the trading system of the London Stock Exchange over our sample period was a dealership system, explicitly modelled on NASDAQ in the mid-1980s.

Results

Returns to Directors' Trading for Full Dataset

Table 2 reports the results from using the full dataset.[7] Abnormal returns are significantly negative in the twenty days before a director's net buy, implying that directors purchase shares on average after a downward run in share price (in the order of 3%). Over the second half of the event window, the share price recovers and abnormal returns are positive on most subsequent days, so that abnormal returns over the 20 days after the director's trade average a significant 1.96%.[8] The patterns are symmetrical in the case of director sells, though the magnitude of abnormal returns is lower. Directors typically sell shares after a run of positive price movements over twenty days of about 1.25%, and abnormal returns are predominantly negative after the directors' net sale, so that excess returns have averaged about 1.5% twenty days after the event. The striking feature of these patterns is that on average, directors appear to be able to time the market in the short run to take advantage of patterns in stock prices. In addition, there are larger stock price changes around directors' purchases than around sales, which is surprising given that sell trades are on average more than six times larger than sells. If trades of comparable size are considered, the effect is much more pronounced. The conventional t and non-parametric Corrado test statistics (for each day in the event window as well the cumulative version) are presented for the buy and sell returns in table 2, and it can be

seen that the CARs remain clearly significant after allowing for event clustering.

Returns to Directors' Trading after earnings announcements

Motivated by this distribution of insiders' trades around earnings announcements in Figure 1, we examine the profitability of a strategy imitating the trades reported on the day or immediately after the announcement. The pattern in share prices around directors' trades may be contaminated by the price reactions to the earnings announcement. We firstly (and somewhat arbitrarily) split our sample of directors' trading signals into those occurring in the ten days immediately after an earnings announcement, and the signals reported at all other times. We report the results in Table 3. It appears that for those 345 directors' buys occurring after an earnings announcement, the pre-signal average CARs are comparable in magnitude to those from the full dataset, but the post-signal CARs are much larger, at 5%. Note also, that excess returns show no sign of levelling off during those 20 days. For directors' buys at all other times, the magnitude of the price reversal is correspondingly smaller and levelling off. The pre-trade returns for the 245 sell signals after an earnings announcement, are 2%, and 1% for directors' sell signals at all other times. There appears to be almost no post-signal abnormal returns for directors' sell signals after an earnings announcement (0.3%), with all of the negative post-signal abnormal returns being generated at other times: selling at the same time as a director and buying back 20 days later would generate average returns of 1.75%. However, the returns after this type of signal have no statistical significance (and it is the only ones for which this is the case). It appears that directors selling after the announcement sell at a higher price, but mimicking this is clearly not profitable for outsiders. Overall therefore, there is

evidence that at least for buy signals, a significant part of the cumulative returns that could be obtained by imitating directors' trades comes from imitating the ones executed immediately after earnings announcement. Though the pattern is still present in other trades, it is much weaker.

We investigate this further by examining buy returns over the first three days in the event window (corresponding to the spikes for days 0, 1 and 2 in Figure 1 since they seem to be the ones executed with the greatest "impatience" (this leaves 165 signals). We also examine all trades taking place during the 30-day period of unusually high activity (again based on Figure 1, which leaves 711 signals (for two 30-day periods, i.e. 60 days out of about 250 trading days per year). The results, reported in table show very clearly that the nearer to the announcement the signal (and the mimicking trade) is observed, the larger subsequent returns are. Signals occurring 3 days after an announcement yield a very large and strongly significant 6.29%, while those occurring in a 30-day period yield a (still sizeable) 2.9%.

Inclusion of transaction costs

As a final step, we assess the profitability of the mimicking strategies after correcting for spread-induced transactions costs: because of the earnings event (and even possibly the trade by the insider as well) spreads may well be wider than usual at the time of the trade, removing most or all of the apparent profitability. In earlier work, Seyhun (1986) and Bettis, Vickrey and Vickrey (1997) adjust for these costs by using spread estimates drawn

from previous studies (therefore not contemporaneous), which are further averaged over time and over portfolios of stocks (for small, medium-sized and large firms). We do not use mean estimates for spreads but actual daily bid and ask price data for each security. Returns so far have been computed from midquote to midquote prices. We now use daily closing bid and ask prices for each security to account for the fact that an outside investor would have to buy (sell) at the market-maker's ask (bid) and do the opposite twenty days later to profit from the price movement. This adjustment removes, for each event, the two half-spreads that would have been incurred at the time of purchase or sale from the previously estimated cumulative abnormal returns (from t_1 =0 to t_2 =20)

$$Net\ CAR_i(t_1, t_2) = CAR_i(t_1, t_2) - S_{i,t1}/2P_{i,t1} + S_{I,t2}/2P_{i,t2}) \qquad (2)$$

Given the width of the spreads for these less-liquid stocks on the London Stock Exchange, the only signals that are of real interest are the buy signals occurring 3 and 10 days after an announcement, since these are the ones likely to be profitable in net terms (although for completeness we also report net average CARs for sells). The results, presented in table 5, suggest that the high returns after buy signals are not compensated by much higher spreads, and they remain profitable to imitate even after taking "round-trip" costs into account: net returns stand at 3.4% and 2.18%respectively (net CARs after sells becoming, as expected, negative). These findings are consistent with US evidence in Barclay and Dunbar (1996), who report that even though the components of the spreads change, the overall costs of trading do not change significantly in the days around earnings announcements.

A caveat is that even though net returns appears sizeable, they only include

"microstructure" transaction costs and not estimates of "institutional" transaction costs (broker's commissions). With all transactions costs taken into account, the market may be closer to semi-strong efficiency than these figures suggest.

Conclusions

In this paper, we report patterns in abnormal returns in the days around a director's trade that are consistent with an ability by directors to forecast short-term excess returns. Consistent with earlier work, buy trades appear more informative than sells. We further examined the magnitude of excess returns around trades executed immediately after earnings announcements, and find that in the case of buy trades at least, the closer to an announcement the trade occurs, the larger the subsequent excess returns are, consistently with a sluggish price adjustment after the announcement. Even after adjusting for "microstructure" transaction costs, sizeable net cumulative abnormal returns remain. A consequence of removing trades occurring after earnings announcements is that the returns to imitating directors' trades at all other times are correspondingly smaller.

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Trades by Directors around Final Earnings Announcements

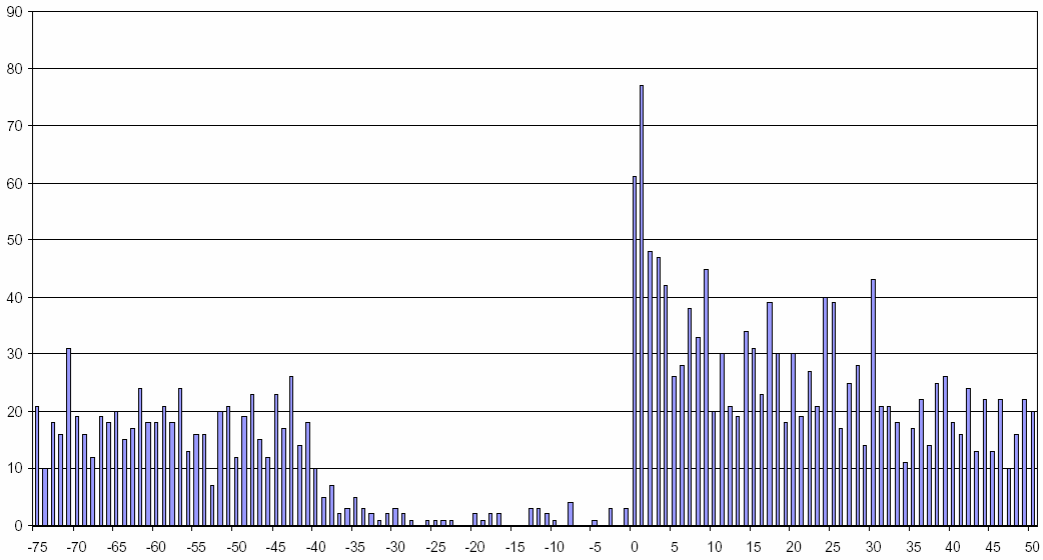

Table 1: Descriptive Statistics for all trades and net trades

	N	p10	Median	p90	Mean	St. Dev.
Panel A: All Trades						
Buys	2,558		6,650		66,068	652,503.5
Sells	1,841		32,600		343,069	3,833,629
Total	4,399					
Panel B: Net Trades						
Buys	1,887	1,750	7,950	70,000	80,044	776,710
Sells	1,522	6,150	30,675	475,517	403,173	4,229,704

The table reports descriptive statistics on individual trades by value in pounds sterling (GBP) in Panel A and net traded value in Panel B The net traded value is used because on some days more than one trade occurred on a given day. N is the total number of trades, p10 and p90 are the tenth and ninetieth percentiles by value, respectively.

Table 2: Abnormal returns after directors' trades and significance tests

Days	Mean AR (%)	t-stat.	CAR(-20,20) (%)	Cumul-t	CAR(0,20) (%)	Cumul Corrado
Panel A: Buy trades						
-20	-0.09	-2.092	-0.09	-2.092		-0.889
-10	-0.09	-2.062	-1.00	-6.794		-3.929
-2	-0.25	-5.599	-2.62	-13.504		-6.822
-1	-0.23	-5.199	-2.85	-14.325		-6.802
0	0.015	3.397	-2.70	-13.238	0.15	-6.178
1	0.27	6.163	-2.42	-11.620	0.42	-5.339
2	0.20	4.485	-2.22	-10.430	0.62	-4.648
10	0.04	0.897	-1.39	-5.609	1.46	-1.698
20	0.08	1.947	-0.89	-3.126	1.96	-0.299
Panel B: Sell trades						
-20	0.05	1.215	0.05	1.215		0.971
-10	0.04	1.050	0.31	2.040		3.201
-2	0.11	2.433	1.05	5.253		5.751
-1	0.17	3.800	1.23	5.970		6.213
0	0.0	-0.214	1.22	5.779	0.0	5.912
1	-0.16	-3.580	1.05	4.883	-0.17	5.074
2	-0.15	-3.432	0.89	4.060	-0.33	4.259
10	-0.08	-1.921	0.16	0.634	-1.07	1.898
20	-0.05	-1.172	-0.23	-0.786	-1.46	1.342

The table reports average abnormal returns on selected days around directors' buy and sell trades. Column 2 lists average daily abnormal returns computed from equation (1). Columns 4 and 6 list average CARs from derived from equation (1) from T1 , the first day in the event window and the day of the trade, respectively. T-statistics on individual days' average abnormal returns (column 3) and on cumulative abnormal returns (column 5) are computed as in Brown and Warner (1985), p. 7 and 29, respectively. Column 7 reports the multi-day version of the non-parametric test statistic of Corrado (1989).

Table 3: 20-day average CARs for directors' trades post-earnings announcement

Signal definition	No. Obs.	CAR(-20,0) (%)	Cumul Corrado	CAR(0,20) (%)	Cumul Corrado
Panel A: All buys	1,675	-2.85	-6.17	1.96	6.22
10-day post EA	345	-2.50	-3.60	4.99	6.65
All other trades	1,330	-2.76	-5.65	1.17	4.24
Panel B: All Sells	1255	1.22	5.91	-1.46	-4.18
10-day post EA	244	2.07	4.85	-0.30	0.41
All other trades	1,011	1.03	4.98	-1.75	-5.15

The table reports cumulative average abnormal returns prior to and after directors' buy and sell trades. The first row of each panel reports the results for the full dataset. The next two rows report average CARs depending on whether or not the trades occurred at most ten days after the earnings announcement.

Table 4: Further analysis of 20-day average CARs for directors' buy trades post-earnings announcement

Signal definition	No. Obs.	CAR(-20,0) (%)	Cumul Corrado	CAR(0,20) (%)	Cumul Corrado
Buys: 2-day post EA	165	-2.73	-2.74	6.29	7.02
All other buy trades	1,510	-2.70	-6.09	1.49	4.79
Buys: 30-day post EA	711	-2.29	-2.90	2.89	5.82
All other buy trades	964	-3.01	-6.27	1.28	3.90

The table reports cumulative average abnormal returns after directors' buy trades, depending on how close to the earnings announcement they occurred.

Table 5: Average buy and sell CARs after inclusion of transaction costs

Signal definition	*Net* CAR(0,20) (%)
Panel A: Buy signals	
All buys	-0.66
10-day post EA	2.18
2-day post EA	3.40
Panel B: Sell signals	
All sells	-0.55
10-day post EA	-2.20
2-day post EA	-1.10

The table reports cumulative average abnormal returns after removing "round-trip" transaction costs (the half-spreads incurred at the time of trading) as in equation (2)

Endnotes

[1]Conyon and Murphy (2000) report that on average 20 per cent of CEO compensation in UK companies is in the form of stock option or share incentive plans, and though this is less than in US firms, is still significant and has grown over time

[2]For the US: Seyhun (1986), Jeng, Metrick and Zeckhauser (1999), Lakonishok and Lee (2001); and for UK: Friederich *et al* (2002), Hillier and Marshall (2002a), Gegory *et al* (1997), Gregory *et al* (1994)]

[3]Though "blackout" periods during which insiders may not trade are often imposed by the company Bettis, C., J. Coles, and M. Lemmon, 2000,

[4]Lakonishok and Lee (2001) report that "...there is very little action around the time when insiders trade. The magnitude of the returns observed is typically below 0.5 percent."

[5] Some directors continue to trade in the prescribed period, apparently ignoring regulations, and it is unclear what penalties these directors face.

[6]The actual transaction price was missing for about 300 of these trades, in most cases for the first two years of the sample. For these we extracted the (unadjusted) price data from Datastream. This is not consequential since we are not computing the profitability of the trading strategy to the insider herself.

[7]Events occurring in the first year of the data are dropped to leave enough days in the estimation window, leaving 1675 buys and 1255 sells.

[8]There are no significant abnormal returns outside this [-20 days,+20 days]window.