Stock Price Patterns around Directors' Trades on the London Stock Exchange

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Abstract

Previous work examined the long-run profitability of strategies mimicking the trades of company directors in the shares of their own company. However, the evidence regarding returns during the month containing the insider trade was ambiguous. The current paper examines the patterns of security returns in the days around the trades of corporate insiders on the London Stock Exchange. We find patterns in abnormal returns that are consistent with directors engaging in short-term market timing: they sell (buy) after an increase (decline) in prices, and their trades are followed by a partial price reversal. We further investigate these patterns when directors trade after earnings announcements, and report that in the case of buy trades, the closed 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.

Keywords: market efficiency, corporate insiders, insider trading, Directors' trading, informed trading.

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1 Introduction

Do the actions of corporate insiders convey information about future company prospects which are not available elsewhere? In terms of informational efficiency, one issue is whether corporate insiders have the ability to time the market, and consequently generate benefits, either for their firms, or for themselves personally. If they are able to generate abnormal profits, this could be interpreted as evidence against strong-form efficiency. Typically, financial regulators assume that corporate insiders' information is superior, and require that their actions be disclosed to the market. A second issue is whether outsiders may obtain excess returns from mimicking the signals sent by the insiders' actions.[1] Significant abnormal returns following an insider's trade could be interpreted as evidence against semi-strong efficiency. Examples of actions potentially timed to benefit the firm are stock splits or issues, corporate repurchases or restructurings. An example of an action timed to benefit the corporate insider personally, and which must be disclosed after it has occurred is the trade of a corporate insider in the shares of his company.

Earlier work in the US by Jaffee (1974) and Finnerty (1976) had suggested that insiders are able to predict and exploit long-run subsequent returns. This apparent semi-strong form inefficiency was explained by Seyhun (1986) in terms of (estimated) transactions costs of trading. Jaffe (1974) and Seyhun (1986) also report evidence of abnormal returns immediately around the insiders' trades. However, conflicting evidence has been produced in recent work by Lakonishok and Lee (1998) who find very little market reaction around the time when insiders trade.[2] Previous work on directors' trading using UK data identified excess returns in the months after the director's trades (Gregory, Matatko, Tonks, and Purkis (1994) and Gregory, Matatko, and Tonks (1997)), but returns during the month containing the trade were found to be not significantly different from zero. The exact day of the event was not precisely identified in this

[1] Appendix 1 gives more evidence on the interest that currently surrounds data on these trades among professional investors.

[2] A possible interpretation of the difference between these findings may be that recent regulatory arrangements have successfully deterred insiders' trades around the release of price-sensitive information, consistently with the results in Garfinkel (1997).

research, therefore whether there have been short term price movements remains an open question. Also, in the latter study, the authors found that the price reaction in the months after the directors' trades was, surprisingly, inversely related to the strength of the signal. They conjectured that this was because in the case of a strong signal, most of the price reaction occurred within the month of the trade.

In the current paper we ascertain the size of excess returns in the days around the director's trade, in order to examine the profitability of a mimicking strategy in the very short-term, explicitly taking "round-trip" (spread) transaction costs into account. We identify short run price patterns around directors' trades: directors buy after a fall in share prices, after which share prices rise; and directors sell after a rise in share prices, which are then followed by a stock price decline. We note the finding in Friederich, Gregory, Matatko, and Tonks (1999) that some insider trading signals dominate others in terms of predictive contents over future returns. We investigate these patterns further and we find that a significant number of directors' trades are done immediately after earnings announcements. Since it is illegal for directors in the UK to trade in the two months prior to an earnings announcement, this pattern in directors' transactions may be due to directors having 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 by insiders to time the market using information less than instantaneously incorporated in stock prices. This can be related to the well known "post-earnings announcement drift", a sluggish price adjustment which has been consistently found to occur in the months and even days after earnings announcements (Chari et al., 1988; Ball and Kothari, 1991)[3]. In much the same way that Chan, Jegadeesh, 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.

There are no studies to our knowledge linking the *short-term* profitability to outsiders of mimicking directors' trades with the earnings announcement. A somewhat related paper by Kabir and Vermaelen (1996) examines the effect on overall market liquidity and

[3]In the UK, Hew, Skerratt, Strong and Walker (1996) find that the post-earnings announcement drift in returns is less pronounced for large and medium-sized UK firms

price informativeness of the introduction of a regulation forbidding corporate insiders to trade two months before an annual earnings announcement on the Amsterdam Stock Exchange (not using actual data on corporate insiders' trades). Garfinkel (1997) examines the effectiveness of the US Insider Trading and Securities Fraud Enforcement Act (1988) aimed at preventing corporate insiders from trading in the period around an earnings announcement.[4] He finds that the effect of this legislation was for insiders to transfer the timing of their transactions until after the earnings announcements. There again, the focus is on the overall effect of the regulation on general market liquidity and price informativeness. The only study formally examining abnormal returns following insiders' trades after earnings announcements is Seyhun (1998, chapter 8).Seyhun (1998) For US stocks, and holding period returns of several months after the trade, he reports no clear evidence that insiders exploit earnings surprises in the months around earnings announcements, which could be interpreted as a confirmation of the effectiveness of US regulatory arrangements.

Further conditioning on whether the directors' trade occurs immediately after an earnings announcement or not, we report that imitating directors' buy trades after an announcement produces large abnormal returns, and they become larger the quicker one trades after the announcement. For sell trades, although we do find that directors seem to sell when prices are high, there are no excess returns from imitating those trades.

Once an adjustment is made for transaction costs, we find that potential short-term abnormal returns to outsiders are still sizeable for buy signals occurring immediately after interim and final earnings announcements.

2 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

[4]In the US, there is no formally defined period during which insiders are prevented from trading. Profits made on short-term "swings" in prices (formally, within 6 months) must be surrendered to the company.

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 (option-related trades were removed from the data). The stock price series used are adjusted for stock splits, stock dividends and issues.

As mentioned above, a contribution of this study is to adjust estimates of the profitability of mimicking strategies for microstructure-induced costs. The selection of stocks was therefore governed by the availability of daily bid and ask prices for February 1986 to end-November 1994, provided roughly in Datastream for deciles 1 to 4 of the constituents of the FT-All Share index. We chose not to focus on the most liquid stocks (FTSE 100 companies) because previous work by Gregory, Matatko, and Tonks (1997) showed higher gross abnormal returns in less-liquid securities. Our sample is comparatively homogeneous in terms of firm size.

A survivorship bias is possible in the sense that prices were not available for dead companies over the period, which includes companies taken over. Our aim is to see whether signals, on average, can be profitably exploited, and not to estimate the profitability of "risk arbitrage" strategies, or around any highly unusual event of the kind. Therefore, whether a small number of (possibly very high) returns made by directors whose companies were acquired would significantly bias estimates upward is an open question.

Over these eight years and 196 companies, we observe a total of 4,399 trades (2,558 buy and 1,841 sell transactions), which represent the raw signal in our empirical work.[5] 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 £66,000, dwarfed by the average sell of about £343,000. The median buy transaction was £6,650, and the median sell was £32,600. The distributions of both types of trades are clearly skewed to the right, with some very large transactions in both cases: the largest transaction on the buy side was almost £23 million (in 1988), while the largest sell was a staggering £154 million (in 1991). Sell transactions are slightly more infrequent, but much larger. Trans-

[5]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.

actions are distributed fairly evenly over the eight-year period, though there appears to be slightly fewer in the last three years of the sample.

2.1 UK regulatory arrangements

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 Figure 1 we plot the daily number of trades (buys and sells) by directors around earnings announcements. There are two earnings announcements (interim and final) per year and per company. The first obvious thing to note is that the number of trades drops dramatically from 40 trading days (two calendar months) before the earnings announcement, illustrating that the legal requirements are broadly obeyed.[6] 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.

[6] Some directors continue to trade in the prescribed period, very probably ignoring regulations (they would presumably not report the trade if they were engaging in illegal insider trading).

3 Methodology

We examine the short-term movements in returns around the event date to investigate the ability of directors to engage in "market-timing" using an event-study methodology. The use of daily data is central to our aims but also an advantage in econometric terms because the joint hypothesis or "bad-model" problem is much less serious in studies that focus on short return windows since daily expected returns are close to zero (as appears in our sample in table 1) and therefore have little effect on estimates of abnormal returns. 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.

The basic signal of a director's trade is the *net* quantity of shares traded on an event day, as is standard in this literature, 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, for every year and for the whole dataset. 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.

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 abnormal returns computations. Descriptive statistics on index returns and company returns and spreads are given in panel C of table 1.

The notation for the modelling of abnormal returns and testing procedures largely follows Campbell, Lo, and MacKinlay (1997) (chapter 4). Event time (a counter) is denoted by τ, with the event date corresponding to $\tau = 0$. The estimation window is defined as the interval from $\tau = T_0 + 1$, to $\tau = T_1$, followed by the event window ($\tau = T_1 + 1$ to $\tau = T_2$). Also let $L_1 = T_1 - T_0$ and $L_2 = T_2 - T_1$ be the length of

the estimation and the event windows, respectively. In this paper, the event window comprises 20 trading days around the event, while the estimation window is made up of the 200 trading days before this. Therefore, $T_0 = -221$, $T_1 = -21$, and $T_2 = 20$. We compute excess returns in the most standard way, using a market model in the definition of expected returns: Letting $R_{i\tau}$ be the daily observed return on the stock, the returns-generating process for firm i is deemed well-approximated by:

$$R_{i\tau} = \alpha_i + \beta_i Rmid_\tau + \varepsilon_{i\tau} \tag{1}$$

where we use the FT-SE Mid 250 index (to which a number of our firms actually belong) as a benchmark, since, as mentioned above, a significant size effect was found in Gregory, Matatko, and Tonks (1997).[7] Parameters $\widehat{\alpha}_i$ and $\widehat{\beta}_i$ are estimated by OLS over the estimation window defined above,and excess returns $AR_{i\tau}$ are computed as:

$$AR_{i\tau} = R_{i\tau} - \widehat{\alpha}_i - \widehat{\beta}_i Rmid_\tau \tag{2}$$

They are then 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, denoted $\overline{CAR}(\tau_1, \tau_2)$:

$$\overline{CAR}(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \left(\frac{1}{N} \sum_{i=1}^{N} AR_{i\tau} \right) \tag{3}$$

where N is the number of events and $T_1 < \tau_1 \leq \tau_2 \leq T_2$. (This is used to accommodate different sampling intervals within the event window, e.g. the post-event period only).

3.1 Significance issues

A potential problem for significance testing is a cross-sectional clustering of events, because the standard errors are not properly estimated in that case. Whether this is worth taking into account if the amount of clustering is not extreme (events common to all firms in the sample) has been debated in the econometric literature (see Campbell,

[7] We also replicated all of the tests using a two-factor model where the first factor $Rall_t$ was the return on the FT-All share index and the second factor was $(Rmid_t - Rall_t)$. The results were insensitive to this change.

Lo, and MacKinlay (1997), chapter 4, and Binder (1998) for overviews). From the simulation studies of Brown and Warner (1980, 1985), and Bernard (1987), the general conclusions that emerge are that using daily data should make clustering on a single date much less severe than when using monthly observations. Bernard (1987) finds that diversification across industries should further mitigate the correlatedness problem. Our sample is highly diversified in this respect, since most industry sectors are present in our data. On the other hand there tends to be clustering in earnings announcement dates across companies, such that the problem could be acute when we focus on this subset of directors' trades.

To allow for the problem of potential event clustering, a non-parametric (rank) testing procedure introduced by Corrado (1989), which does not rely on normality assumptions, was used. This has been shown in simulations to be much more robust to thin trading problems among others. Campbell and Wasley (1993) for instance consider the test to be well-adapted to Nasdaq 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, such that we would expect the data examined by Campbell and Wasley to share several features with our own.

The idea behind this statistic is to sort the series of abnormal returns over *both* the estimation and event windows and transform each observation into its respective rank: $k_{i\tau} = rank(AR_{i\tau})$, for $\tau = T_0 + 1, ..., T_2$. The rank statistic is the ratio of the mean deviation of the securities' day-0 ranks ($k_{i\tau}$) to the estimated standard deviation of the portfolio mean abnormal rank:

$$Z = \left(\frac{1}{N} \sum_{i=1}^{N} (k_{i\tau} - E(k_i)) \right) / \widehat{s}(k) \tag{4}$$

Where $E(k_i)$ is the expected rank for security i, equal to $(L_1 + L_2 + 1)/2$. The denominator, $\widehat{s}(k)$, is the estimated standard deviation of the portfolio mean abnormal return rank, again over both estimation and event windows.

$$\widehat{s}(k) = \sqrt{\frac{1}{L_1 + L_2} \sum_{\tau=T_0+1}^{T_2} \left((1/N) \sum_{i=1}^{N} (k_{i\tau} - E(k_i)) \right)^2}$$

The Corrado statistic is asymptotically unit normally distributed. In the case of multi-day event windows, the following statistic is formed:

$$\sum_{\tau=\tau_1}^{\tau_2} \overline{k}_\tau \Bigg/ \sqrt{\sum_{\tau=\tau_1}^{\tau_2} \widehat{s}^2(\overline{k}_\tau)} \tag{5}$$

4 Results

4.1 Full dataset

Using the full dataset[8] a first run through the data yielded the following results: for director buys, abnormal returns are significantly negative in the twenty days before the net purchase, 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 clearly recovers and abnormal returns are positive on most days, so that abnormal returns over the 20 days after the director's trade average a significant 1.9%[9] (plain line in figure 2a and table 2). The patterns are symmetrical in the case of director sells (plain line in figure 2b and table 3), 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. It can be seen that price reversals start occurring on average on the day before the directors' trade, which could imply that at least part of the price reversal is not caused by the event. These results are in contrast with those reported in Lakonishok and Lee (1998) for the US market, who, as mentioned above, find very small or no abnormal returns immediately around the trades.

The second noticeable fact is that larger stock price changes occur around purchases than around sales. These results, using all trades in the data, are made even more

[8] 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.

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

striking 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. There is a corresponding finding in papers on long-run excess returns following the trades of corporate insiders, such as Lakonishok and Lee (1998), or Jeng et al. (1999) but also in the literature studying the price impact of block trades (e.g. Chan and Lakonishok (1993)). One explanation given is that block purchases convey more information than block sells. Allen and Gorton (1992) for instance argue that decisions to buy should be more information-based and decisions to sell should be more liquidity-based on average. The interpretation cannot be directly extended to the case of directors' trades, since what we observe is not just a price impact due to the trade itself, unlike block trades.

The interested reader can find the conventional t-statistics in Friederich, Gregory, Matatko, and Tonks (1999), the working paper version of this paper. They are not reported here for brevity since they are likely to be less robust than the Corrado stats. These Corrado test statistics (for each day in the event window as well the cumulative version) are presented for the buy and sell returns in tables 2 and 3. We computed the Boehmer, Musumeci, and Poulsen (1991) test statistic, which is robust to variance changes around the event (as seems likely to be the case here), and the CARs remained clearly significant. We also recomputed the excess returns themselves using a Scholes and Williams (1977) adjustment for thin trading. This did not significantly alter their magnitude.[10]

From these patterns in prices, it is clear why previous work using monthly data found returns in the month containing the trade to be about zero, and with little or no statistical significance: the changes in price before the trade largely cancels out that after the trade on average.[11]

[10] All of these results can be found in the earlier working paper version of the current paper.

[11] Very large abnormal returns seemed to appear in a few cases, and we ascertained that our results were not driven by a few influential observations by identifying outliers using the methodology presented in Hadi (1992, 1994). This detected 19 cases of extreme returns after buy trades, and only 3 cases of extreme returns after sell trades. Removing them lowered average $CARs$ after buy transactions to 1.66% and left $CARs$ after sell trades virtually unchanged (at 1.48%). Therefore the impact of this correction, while not negligible in the case of buys, did not significantly alter our findings.

4.2 Returns after earnings announcements

Motivated by the distribution of directors' trades around earnings announcements plotted in figure 1, we examine the profitability of a strategy imitating the trades reported on the day or immediately after the announcement. As seen on figure 1, there is a substantial increase of directors' trading in the thirty days after an earnings announcement, and this is particularly pronounced on the event day itself and during the following two days. Since it is forbidden for directors to trade for two months before an announcement, it is unclear at priori whether this activity represents postponed liquidity trades, or whether directors try to take advantage of a possible sluggish price adjustment. Put differently, 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 tables 4 and 5 as well as figures 2a and 2b. It appears that for those 345 directors' buys occurring after an earnings announcement, the pre-signal CARs are comparable in magnitude to those from the full dataset, but the post-signal CARs are much larger, at 5%. This appears very clearly in figure 2a. For directors' buys at all other times, the magnitude of the price reversal is correspondingly smaller. 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 and importantly, 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 to be the case that directors selling after the announcement sell at a higher price, but mimicking this is clearly not profitable for outsiders. Overall therefor, 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.[12]

[12] Although, again, the pattern is still present in other trades, but 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 days per year). The results, reported in table 6 and figure 3, show very clearly that the nearer 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%.

4.3 Inclusion of transaction costs

As a final step, we assess the profitability of the mimicking strategies after correcting for microstructure (spread) transactions costs. Unlike previous research, we do not use mean estimates for spreads but actual daily bid and ask price data for each security. These estimates of transactions costs may be seen as relatively conservative, since they are closing prices and research on patterns in the bid-ask spreads in the London Exchange has documented that they decline at the end of the trading day (presumably for inventory management reasons by market makers). In the case of a small number of very large trades, the mid-point to mid-point returns calculation could arguably be preferable, since there is evidence that the execution prices of a sizeable proportion of block trades in London are negotiated and occur somewhere within the quotes or even at the mid-point (Reiss and Werner (1994)). But the average director trade in our data is not very large by London Exchange standards, traditionally geared towards institutional investors, such that most of these trades would actually occur at or near the bid and ask quotes.

Whereas returns have so far been computed from midpoint price to midpoint price, we now remove from the previously estimated cumulative abnormal returns (from $\tau_1 = 0$ to $\tau_2 = 20$) for each event the two half-spreads that would have been incurred at the time of purchase or sale:

$$Net\ CAR_i(\tau_1, \tau_2) = CAR_i(\tau_1, \tau_2) - (S_{i,\tau_1}/2P_{i,\tau_1} + S_{i,\tau_2}/2P_{i,\tau_2}) \tag{6}$$

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 tables 7 and 8) are that these buy signals, followed by higher returns, are not compensated by much higher spreads, such 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 being, as expected, negative). These findings are consistent with the evidence in Barclay and Dunbar (1996) and Krinsky and Lee (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 the 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.

It remains to be seen how the excess returns found in the current paper could change the conclusions of previous studies which were using monthly data and were not able to statistically identify short-term excess returns. We leave this for future research but our results generally highlight the need to study events which may constitute market timing in the short as well as in the longer run and at different frequencies.

5 Summary and conclusion

Previous work examining the profitability of the trades of corporate insiders and of strategies mimicking these trades reported mixed evidence on long-run abnormal returns following these trades. The evidence regarding returns during the month (or even the two weeks) containing the trade, however, was either contradictory or unreliable. This paper examined the patterns of security returns immediately around the trades of corporate insiders in the shares of their own company, to detect possible movements in abnormal returns around directors' trades, and to assess the returns to strategies mimicking directors' trades in the days immediately following the trade, after taking

transactions costs into account.

We find patterns in abnormal returns in the days around a director's trade that are consistent with trading on short-lived information by directors. This could be interpreted as evidence that the insider trading rules in place in London were not fully serving their intended purposes or, maybe more realistically, as a reflection of the impossibility to prevent trading around all events in the life of a public company that are susceptible of influencing its share price in the short run but do not have to be disclosed to the market.

We also report that some types of trades predict higher future returns. In line with previous work on this topic but also on the price effects of block trades, buy trades are followed by larger abnormal returns than sells. We then focus on trades executed immediately after earnings announcements and report that in the case of buy trades, the closer to an announcement the trade occurs, the larger the subsequent excess returns are, consistently with a sluggish price adjustment after the announcement ("post-earnings announcement drift"). Even after adjusting for "microstructure" transaction costs, sizeable net cumulative abnormal returns remain.

Earlier studies on long-run returns in the UK found no evidence of abnormal returns in the month of the insider trade. The results in the current paper can explain this surprising finding. We found that the patterns in daily returns immediately around the insider trade are largely offsetting, so that in the earlier studies the price effects in the month of the trade were canceling out due to the lower frequency of the data used. The implication is that the evidence documented earlier on long-run abnormal returns should be adjusted upwards to take account of the price movement from the day of the insider trade.

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Table 1

Descriptive statistics

	N	p10	Median	p90	Mean	St. Dev.	Skew	Kurtosis
Panel A: Raw Signals								
Buys	2,558		6,650		66,068.4	652,503.5	27.54	859.64
Sells	1,841		32,600		343,068.9	3,833,629	35.89	1419.04
Panel B: Net signals								
Buys								
1986	38	1,125	11,625	695,600	156,999	433,530		
1987	211	1,470	8,600	140,040	82,303	289,228		
1988	233	1,568	6,500	100,800	195,764	1,569,983		
1989	238	1,756	8,600	74,400	32,525	94,201		
1990	258	2,060	9,369	69,550	78,430	695,286		
1991	218	1,740	6,680	65,000	114,496	1,272,066		
1992	296	2,020	7,323	40,750	57,061	402,183		
1993	170	2,333	8,806	52,400	42,241	230,441		
1994	225	1,330	7,488	32,250	22,627	93,567		
Overall	1,887	1,750	7,950	70,000	80,044	776,710	23	605
Sells								
1986	33	5,400	48,000	553,500	257,049	750,182		
1987	241	5,742	33,500	673,460	343,950	1,230,274		
1988	226	4,622	27,150	325,440	166,815	465,732		
1989	206	6,160	37,860	373,500	958,938	10,753,229		
1990	169	6,440	48,200	647,500	424,028	2,168,552		
1991	217	6,440	28,176	742,500	577,511	3,019,809		
1992	164	5,396	27,593	391,500	222,227	717,038		
1993	180	7,504	30,419	490,000	263,963	845,109		
1994	86	6,844	20,865	148,750	70,632	167,798		
Overall	1,522	6,150	30,675	475,517	403,173	4,229,704	32	1157
Panel C: Returns and spreads								
R_i	404328		0		0.00041	0.0196	-0.88	0.5
Rmid	2090		0.000725		0.00036	0.0086	-0.11	0.074
spread	404817		0.0185		0.0232	0.018		0.67

The table reports descriptive statistics on signals and sample stock returns. “p10" and “p90" are the tenth and ninetieth percentiles, respectively.

Table 2

Abnormal returns and significance tests (Buy trades)

Days	$\overline{AR}$	Corrado	$\overline{CAR}(-20, 20)$	Cumul. Corrado	$\overline{CAR}(0, 20)$
-20	-0.000932	-0.889	-0.00093	-0.889	
-15	-0.001168	-1.857	-0.00484	-2.35	
-10	-0.000919	-2.424	-0.01004	-3.929	
-8	-0.001026	-1.652	-0.01262	-4.691	
-6	-0.002484	-0.628	-0.01638	-4.9	
-4	-0.003491	-3.569	-0.02166	-5.913	
-3	-0.002080	-2.979	-0.02374	-6.448	
-2	-0.002496	-2.379	-0.02624	-6.822	
-1	-0.002317	-0.682	-0.02855	-6.802	
0	0.001514	2.106	-0.02704	-6.178	0.00151
1	0.002747	3.272	-0.02429	-5.339	0.00426
2	0.001999	2.751	-0.02229	-4.648	0.00626
3	0.001729	2.139	-0.02056	-4.113	0.00799
4	0.000884	1.850	-0.01968	-3.66	0.00887
6	0.001022	1.829	-0.01724	-2.817	0.01131
8	0.001279	1.420	-0.01539	-2.397	0.01316
10	0.000400	1.643	-0.01392	-1.698	0.01463
15	0.000351	0.376	-0.01049	-0.554	0.01806
20	0.000868	1.567	-0.00892	-0.299	0.01963

The table reports abnormal returns on selected days around a director's buy trade. Column 2 lists average daily abnormal returns computed from equation 2. Column 4 lists average cumulative abnormal returns from equation 3 from the beginning of the event window. Z-statistics on individual days' average abnormal returns (column 3) and on average CARs (column 5) are computed as in Corrado (1989). The last column reports average CARs computed from the event day.

Table 3

Abnormal returns and significance tests (Sell trades)

Days	$\overline{AR}$	Corrado	$\overline{CAR}(-20, 20)$	Cumul. Corrado	$\overline{CAR}(0, 20)$
-20	0.000561	0.971	0.00056	0.971	
-15	-0.000296	0.827	0.00040	1.656	
-10	0.000485	1.364	0.00312	3.201	
-8	0.000467	0.369	0.00394	3.364	
-6	0.000970	1.994	0.00591	4.131	
-4	0.001321	2.366	0.00812	4.851	
-3	0.001327	2.663	0.00945	5.342	
-2	0.001124	2.403	0.01057	5.751	
-1	0.001755	2.717	0.01233	6.213	
0	-0.000099	-0.689	0.01223	5.912	-0.000099
1	-0.001653	-3.296	0.01058	5.074	-0.001752
2	-0.001585	-3.373	0.00899	4.259	-0.003337
3	-0.001140	-1.191	0.00785	3.926	-0.004477
4	-0.000183	0.355	0.00767	3.918	-0.004660
6	-0.001447	-2.156	0.00497	3.095	-0.007361
8	-0.001110	-2.098	0.00331	2.353	-0.009017
10	-0.000887	-0.891	0.00163	1.898	-0.010700
15	-0.000101	0.885	0.00078	2.051	-0.011553
20	-0.000541	-0.540	-0.00232	1.342	-0.014654

The table reports abnormal returns on selected days around a director's sell trade. Column 2 lists average daily abnormal returns computed from equation 2. Column 4 lists average CARs from equation 3 from T_1, the first day in the event window. Z-statistics on individual days' average abnormal returns (column 3) and on cumulative abnormal returns (column 5) are computed as in Corrado (1989). The last column reports average CARs computed from the event day.

Table 4

20-day average CARs for buy signals after the earnings announcement

Signal def.	No obs	$\overline{CAR}(-20,0)$	*Corrado*	$\overline{CAR}(0,20)$	*Corrado*
All Buys	1675	-2.85%	-6.17	1.96%	6.22
10 day post EA	345	-2.50%	-3.60	4.99%	6.65
All other	1330	-2.76%	-5.65	1.17%	4.24

The table reports cumulative average abnormal returns prior to and after directors' buy trades. The first row reports the results for the full dataset. The next two rows report CARs depending on whether the trades occur after an earnings announcement.

Table 5

20-day average CARs for sell signals after the earnings announcement

Signal def.	No obs	$\overline{CAR}(-20,0)$	*Corrado*	$\overline{CAR}(0,20)$	*Corrado*
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	1011	1.03%	4.98	-1.75%	-5.15

The table reports cumulative average abnormal returns prior to and after directors' sell trades. The first row reports the results for the full dataset. The next two rows report CARs depending on whether the trades occur after an earnings announcement.

Table 6

Further post-earnings announcement buy CARs

Signal def.	No obs	$\overline{CAR}(-20,0)$	*Corrado.*	$\overline{CAR}(0,20)$	*Corrado*
3-day post EA	165	-2.73%	-2.74	6.29%	7.02
Other	1510	-2.70%	-6.09	1.49%	4.79
30-day post EA	711	-2.29%	-2.90	2.89%	5.82
Other	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 have occurred.

Table 7

Average buy CARs after inclusion of transactions costs

Signal definition	$Net\ \overline{CAR}(0,20)$
All buys	-0.66%
10 day post EA	2.18%
3-day post EA	3.40%

The table reports CAARs after removing "round-trip" transaction costs (the half-spreads incurred at the time of trading) as in equation 6.

Table 8

Average sell CARs after inclusion of transactions costs

Signal definition	$Net\ \overline{CAR}(0,20)$
All sells	-0.55%
10-day post EA	-2.2%
3-day post EA	-1.1%

The table reports CAARs after removing "round-trip" transaction costs (the half-spreads incurred at the time of trading) as in equation 6.

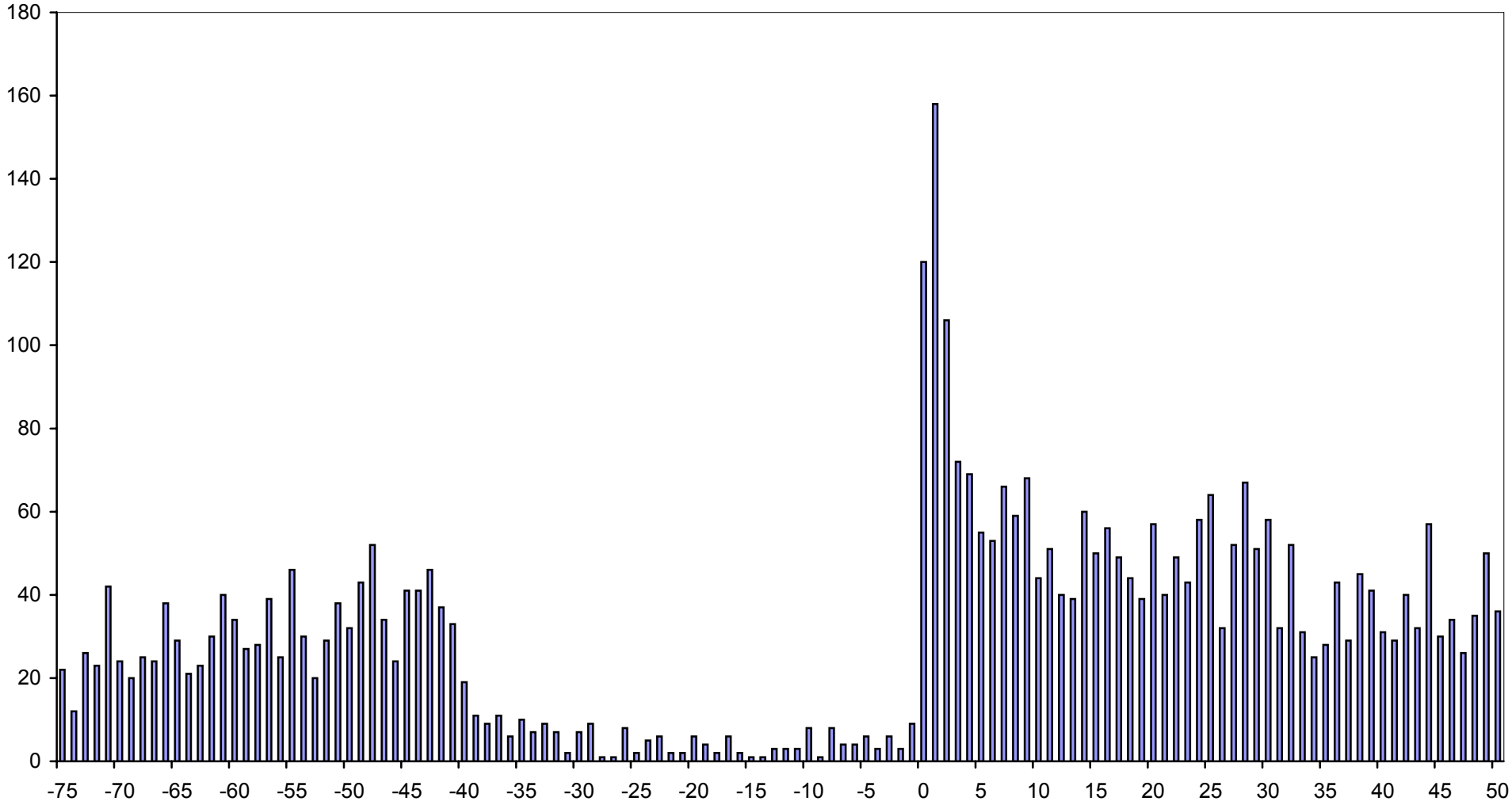

Fig 1: Directors' trades around Earnings Announcements (Oct. 1986 - Nov. 1994)

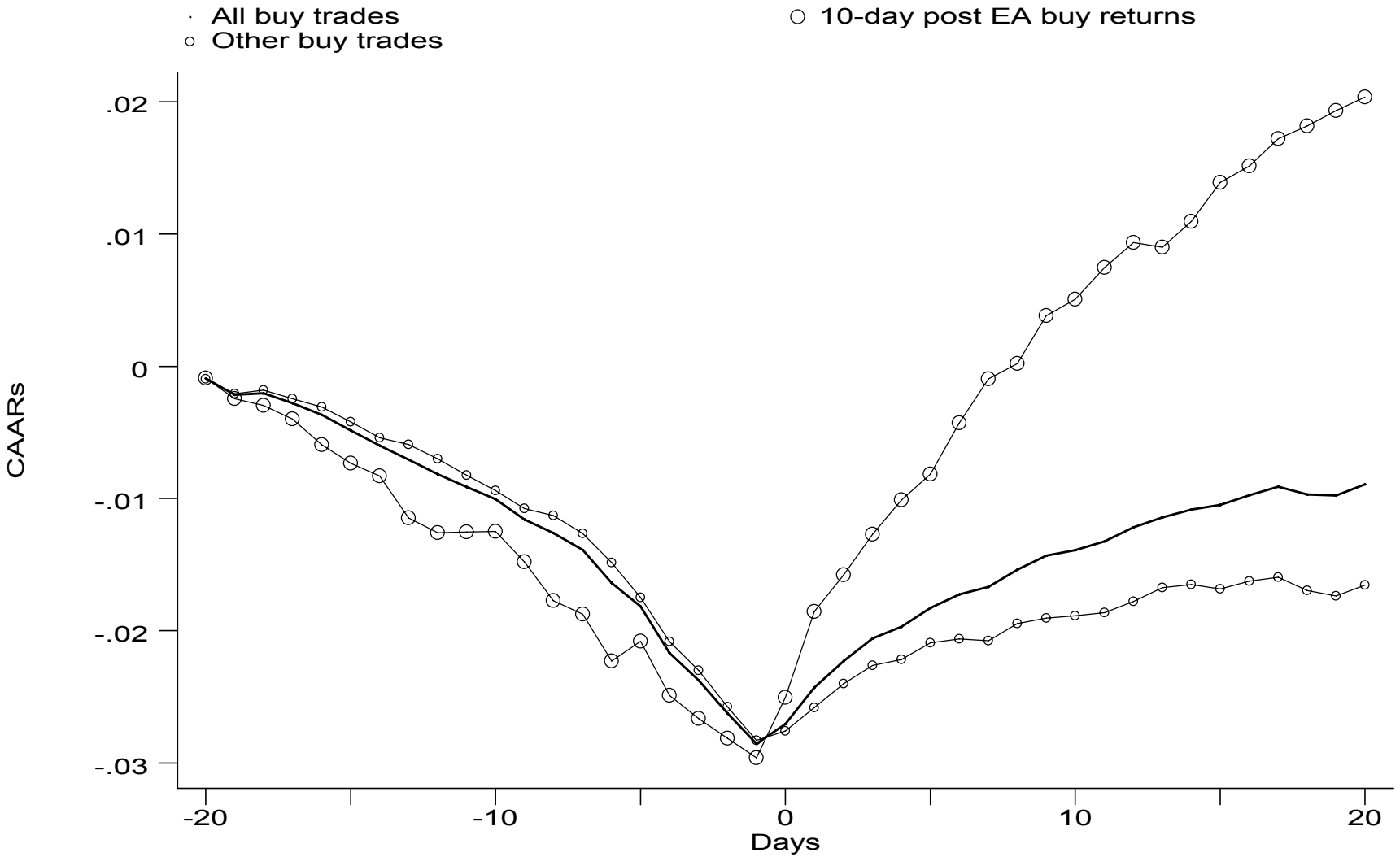

Fig 2a: Returns around directors' buy trades

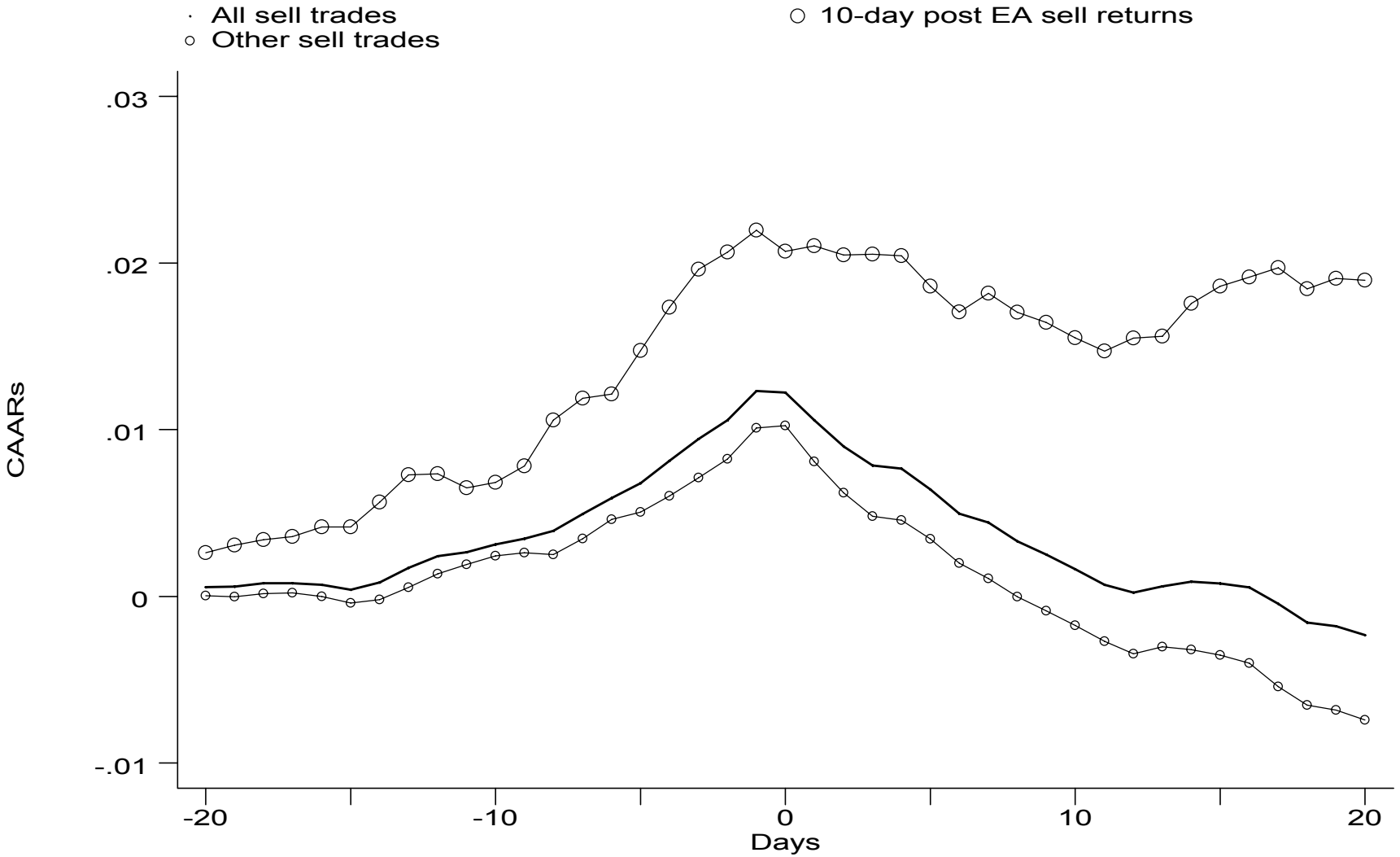

Fig 2b: Returns around directors' sell trades

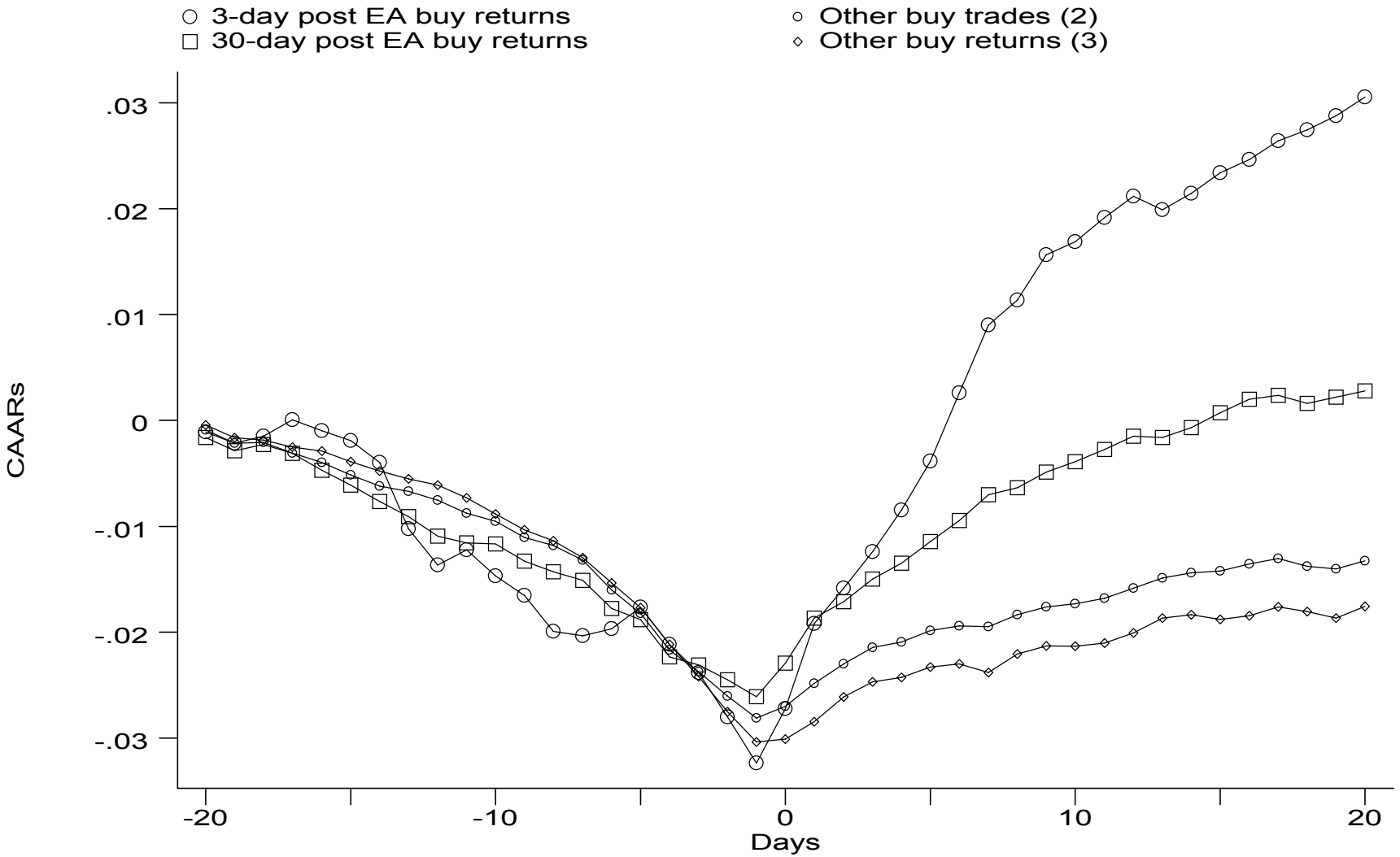

Fig 3: Returns around directors' buy trades